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THE INFLUENCE OF ONLINE DATING ON EMERGING ADULTS' LEVELS OF
EMPATHY, OBJECTIFICATION OF OTHERS, AND QUALITY OF ROMANTIC
RELATIONSHIPS

by
ZACHARY DAVID BLOOM
B.A. Bradley University, 2006
M.A.T. National Louis University, 2008
M.A. Rollins College, 2013

A dissertation submitted in partial fulfillment of the requirements
For the degree of Doctor of Philosophy
In the College of Education and Human Performance
At the University of Central Florida,
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Major Professors
Glenn W. Lambie
Dalena Dillman Taylor

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Dedicated to Judy and Bob and Rachel and Zach and Molly

ABSTRACT

The purpose of this research study was to investigate the directional relationship between emerging adults' intensity of online dating and their levels of empathy, objectification of others, and quality of romantic relationships. This investigation tested the theoretical model that emerging adults' ($N = 1,613$) intensity of online dating (as measured by the *Online Dating Intensity Scale* [ODI]) contributed to their levels of empathy (as measured by the *Adolescent Measure of Empathy and Sympathy* [AMES]; Vossen, Piotrowski, & Valkenburg, 2015), objectification of others (as measured by the *Sexual-Other Objectification Scale* [SOOS]), and quality of relationships with romantic partners (as measured by the *Relationships Structure Questionnaire* [ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011] and *Relationship Assessment Scale* [RAS; Hendrick, 1988]). Specifically, the researcher tested the hypothesized directional relationship that emerging adults with greater intensity of using online dating services (e.g., websites and applications) would have (a) decreased levels of empathy, (b) increased levels of objectification of others, and (c) decreased quality of relationships with romantic partners. In addition, the researcher investigated the relationship between emerging adults' demographic variables (e.g., age, gender, ethnicity, etc.) and the intensity of their use of online dating services, levels of empathy, objectification of others, and relationship quality with romantic partners.

The researcher conducted a thorough review of the literature regarding the constructs of interest in this investigation, providing conceptual evidence and empirical support for the research hypotheses and exploratory research questions. A convenience

sample of emerging adult undergraduate or master's level students enrolled in various colleges and universities throughout the United States were invited to participate in this study. The researcher collected data through web-based survey and face-to-face administration. The researcher employed structural equation modeling (SEM) analyses to test the research hypothesis. In order to utilize SEM, the researcher also conducted confirmatory factor analyses and exploratory factor analyses to evaluate the validity and reliability of the assessment data used in the investigation. Additionally, the researcher conducted multiple linear regression, Pearson Product-Moment correlations, Spearman Rank Order correlations, and analysis of variance to analyze the data for the exploratory questions.

The results of the structural equation model (SEM) analyses identified that emerging adults' intensity of online dating contributed to their levels of empathy (5.3% of the variance explained) and objectification of others (9% of the variance explained). Furthermore, the results of the analyses indicated a dynamic relationship between emerging adults' levels of empathy and objectification of others. Specifically, emerging adults' level of empathy shared a strong negative relationship with their level of objectification of others (98% of the variance explained). In contrast, emerging adults' level of objectification of others positively related to empathy (59.3% of the variance explained). Lastly, emerging adults' levels of empathy and objectification of others contributed to emerging adults' quality of romantic relationships (64% of the variance explained; 37% of the variance explained respectfully).

The researcher compared the findings from the current investigation to previous research and assessed the limitations of this study. The findings from the study have implications for future research, clinical practice, counselor education, and instrument development. Specifically, findings from this investigation provide support for (a) increased clinical awareness of emerging adults' widespread use of online dating services; (b) the incorporation of social communication technology and online dating subjects into CACREP accredited counseling courses; and (c) insight into the instrument development of the ODI, AMES, and SOOS.

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When asked what the dissertation process is like, I have told people that it's like being pregnant and waiting to give birth (let's pretend I know what that's like). But, aside from a few questionable food and beverage choices I've made, it's probably more like raising a child – especially in the sense of the colloquial phrase, “it takes a village.” As such, I want to thank my village.

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CHAPTER ONE: INTRODUCTION

Emerging adults (18-29 year olds) are an unique counseling population with distinct social circumstances (Arnett, 2000; Siegel, 2013; Tao, 2013). One of the primary components of emerging adult development is the formation and maintenance of interpersonal and romantic relationships (Arnett, 2015; Chickering & Reisser, 1993), which take on a new level of seriousness post-adolescence (Fincham & Cui, 2000). Combined with the social communication zeitgeist of today's technological era (Bargh & McKenna, 2004), researchers are compelled to explore the influence of technology on relationship development (Cyr, Berman, & Smith, 2015).

Researchers identified empathy as central to healthy relationships (Siegel, 2013; Szalavatz & Perry, 2010) and expressed concern over a trend of declining empathy in emerging adults since the year 2000 (Konrath, O'Brien, & Hasing, 2011). Concurrently, technology use (Lenhart, 2015) and online dating have become common practice (Smith & Duggan, 2013), and may be associated with individual and/or relational issues (Hertlein & Stevenson, 2010). The purpose of the current research study was to investigate the directional relationship between emerging adults' use of online dating with their levels of empathy, objectification of others, and quality of relationships with romantic partners.

This investigation tested the theoretical model that emerging adults' intensity of online dating (as measured by the *Online Dating Intensity Scale* [ODI]) contributed to their levels of empathy (as measured by the *Adolescent Measure of Empathy and Sympathy* [AMES; Vossen, Piotrowski, & Valkenburg, 2015]), objectification of others

(as measured by the *Sexual-Other Objectification Scale* [SOOS]), and quality of relationships with romantic partners (as measured by the *Relationships Structure Questionnaire* [ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011] and *Relationship Assessment Scale* [RAS; Hendrick, 1988]). Specifically, the researcher tested the hypothesized directional relationship that emerging adults with greater intensity of using online dating services (e.g., websites and applications) would have (a) decreased levels of empathy, (b) increased levels of objectification of others, and (c) decreased quality of relationships with romantic partners. In addition, the researcher investigated the relationship between emerging adults' demographic variables (e.g., age, gender, ethnicity, etc.) and the intensity of their use of online dating services, levels of empathy and objectification of others, and relationship quality with romantic partners.

In order to practice as competent and ethical mental health professionals (American Counseling Association [ACA], 2014), counselors must be prepared to work with a variety of client populations with an array of presenting issues. Emerging adults (Arnett, 2000; Arnett 2004; Arnett & Tanner, 2006) are a counseling population that needs greater clinical attention (Tanner et al., 2007). In addition, the Council for Accreditation of Counseling and Related Educational Programs (CACREP, 2016) charges counselors, counselor educators, and researchers to examine contemporary societal issues in the counseling field. Scholars identified technology and Internet use as potentially problematic (Hertlein & Stevenson, 2010) for couples (Kerkhof, Finkenauer & Muusses, 2011), families (Bloom & Dillman Taylor, 2015; Vaterlaus, Beckert, Tulane, & Bird, 2014), and emerging adults (De Leo & Wulfert, 2013). Indeed, clients are

presenting at increasing rates to counseling with intimacy problems related to their online activities; yet, mental health professionals report being undertrained or inadequately prepared by their training program to work with clients with these presenting issues (Goldberg, Peterson, Rosen, & Sara, 2008).

To prepare counselors to meet ethical and professional standards, researchers provide evidence that supports or contests theoretical models of clinical importance, which is then delineated by counselor educators (CACREP, 2016). In contemporary western society, individuals are using digital mediums (i.e., online dating) to form relationships with greater frequency than ever before (Smith & Duggan, 2013). However, researchers have identified risks and dangers associated with online dating (Couch, Liamputtong, & Pitts, 2012) and criticized online dating as an impracticable format to form romantic relationships due to its bypassing of nonverbal communication (Riva, 2002) and promotion of other-objectification (Hitsch, Hortacsu, & Ariely, 2006). The evaluative nature of online dating (Sritharan, Heilpern, Wilbur, & Gawronski, 2010) theoretically opposes empathic connection, a prerequisite for healthy interpersonal relationships (Szalavatz & Perry, 2010; Siegel, 2010). While researchers have investigated counseling implications associated with online dating, empathy, objectification of others, and romantic relationships, an extensive review of the published literature (using the ERIC database) failed to identify a research study, dissertation, or thesis, that examined these constructs simultaneously nor in accordance with one another. Therefore, this study investigated the influence of online dating on the constructs of interest established in the counseling literature (e.g., empathy, objectification of others,

and the quality of romantic relationships) with a sample of emerging adult college students (e.g., undergraduate, master's level). The research questions and findings of the current investigation align with the professional standards of the counseling field and contribute to a growing body of literature examining counseling implications associated with online dating in emerging adult populations.

Statement of the Problem

As an adolescent moves beyond childhood, the individual develops improvements in abstract thinking and emotional regulation (Hoffman, 2000) that results in increased empathy development (Fabes, Carlo, Kupanoff, & Laible, 1999). Researchers identified the essential role of empathy in building healthy interpersonal and romantic relationships (Allemand, Steiger, & Fend, 2015; Siegel, 2013; Szalavatz & Perry, 2010), which take on a new level of seriousness in emerging adulthood (Fincham & Cui, 2000). However, researchers have identified an overall decrease in empathy in American emerging adults since the year 2000 (Konrath, O'Brien, & Hasing, 2011). Konrath and colleagues (2011) theorized that the decrease in emerging adults might be related to the increasing availability and use of online technology and communication.

Indeed, emerging adults use technology to communicate with peers and to form and maintain romantic relationships (Schade, Sandberg, Bean, Busby, & Coyne, 2013). Researchers examined the use of social communication technology on emerging adults and reached mixed conclusions about its impact on relationships and wellbeing (Bargh & McKenna, 2004). In summary of their meta-analysis ($k = 43$) on social communication

technology and wellbeing, Best, Manktelow, and Taylor (2014) reported inconsistent findings and recommended that future studies move towards the exploration of *specific* activities practiced online as opposed to the quantity or frequency of general online use. One such online activity being practiced with increasing prevalence is online dating (Smith & Duggan, 2013).

Researchers examined the experiences (Heino, Ellison, & Gibbs, 2010), characteristics (Blackhart, Fitzpatrick, & Williamson, 2014), and practices of online daters (Hitsch, Hortacsu, & Ariely, 2006), and identified that online daters tend to place greater emphasis on physical attractiveness and “looks” of potential partners compared to traditional daters (Rosen, Cheever, Cummings, & Felt, 2008). As such, researchers examined the evaluative nature of online dating (Sritharan et al., 2010) and the associated promotion of self-objectification and other-objectification (Hitsch et al. 2006). The concern amongst researchers is that objectification of others perpetuates a cycle of objectification (Davidson, Gervais, & Sherd, 2015; Strelan & Hargreaves, 2005), which is associated with a variety of clinical issues (e.g., depression, anxiety, disordered eating; Fredrickson & Roberts, 1997; Moradi & Huang, 2008).

While the literature on objectification is developing (Szymanski, Moffitt, & Carr, 2011), researchers have begun to explore associations between physical environments and experiences of objectification (Moffitt & Szymanski, 2011). However, researchers have *not* yet examined objectifying online environments, or associations with their use. In light of emerging adults’ increasing use of technology and online dating services for the purpose of forming and maintaining romantic relationships (Schade et al., 2013), as well

as emerging adults' overall decreasing levels of empathy (Konrath et al., 2011), research investigating relationships between these constructs is warranted. While some research exists examining the association between some of these constructs (e.g., objectification of others and romantic relationships [DeVille, Ellmo, Horton, & Erchull, 2015; Zubriggen, Ramsey, & Jaworski, 2011]; empathy and romantic relationships [Cramer & Jowett, 2010; Thomsen & Gilbert, 1998]), the constructs of online dating, empathy, objectification of others, and quality of romantic relationships have *not* been investigated together. Therefore, this research study is the first to investigate the directional relationships between emerging adults' use of online dating services and the relational constructs of empathy and objectification of others on quality of romantic relationships.

Significance of the Study

The contribution of the findings from the current research investigation provide: (a) increased awareness of attributes of emerging adult online daters and (b) further understanding of the relationship between empathy and objectification of others and quality of romantic relationships. Additionally, this investigation clarifies existing definitions of the constructs of empathy and social communication technology, which have been confounded in the literature by researchers providing varying definitions. The findings from this investigation contribute to a growing body of literature regarding the influence of online dating on emerging adult populations.

Significance for Counselors

Emerging adults have been identified as a unique counseling population with distinct counseling implications (Arnett, 2000; Siegel, 2013; Tao, 2013) related to their use of technology and the Internet (De Leo & Wulfert, 2013). The current generation of emerging adults is unique in that they are the first cohort to have grown up in a technological age with regular use of online technology (Best et al., 2014). The findings from this study contribute to a greater understanding of emerging adults in relation to their levels of empathy (Eisenberg, Morris, McDaniel, & Spinrad, 2009) and objectification of others (Moradi & Huang, 2008). Due to the clinical implications associated with empathy deficits (Hare, 1991) and other-objectification (Fredrickson & Roberts, 1997), findings from this study can be used to assess emerging adults for issues related to these constructs and to inform appropriate interventions and/or psychoeducation.

Furthermore, technology use (Lenhart, 2015) and online dating are common practice (Smith & Duggan, 2013), and may be linked to individual or relational issues (Hertlein & Stevenson, 2010). The findings from this study provide insight into the quality of romantic relationships between users and nonusers of online dating services, as well as further exploration of the levels of empathy or other-objectification of online daters, which influence romantic relationships (Cramer & Jowett, 2010; DeVille et al., 2015; Levenson & Gottman, 1985; Zurbriggan et al., 2011). The findings from this investigation inform clinicians' assessment of clinical issues and application of

interventions and psychoeducation in regard to online dating and relationship development.

Significance for Counselor Educators

Recommendations made by CACREP (2016) encourage the examination of contemporary societal issues in the counseling field. One such issue is that of social communication technology (SCT) amongst emerging adults (Hoffman, 2013; Mesch & Talmud, 2010; Tao, 2013). While CACREP recommends counselor educators to use technology in the classroom, CACREP does *not* require counselor educators to delineate clinical issues related to technology use to counselors-in-training. Perhaps because CACREP does *not* require counselor educators to discuss clinical issues related to technology use as part of master's students' clinical training, counselors report being undertrained and unprepared to work with clients with issues related to intimacy stemming from online use (Goldberg et al., 2008).

The findings from this study relate to online dating and quality of romantic relationships. Further, the findings from this study provide data on emerging adults' levels of empathy and other-objectification in the context of use of online dating services. The data reported in this investigation provides clinical implications relevant to courses taught in CACREP accredited programs including courses in (a) couples counseling, (b) human development, (c) counseling theory, and (d) diagnosis and treatment.

Significance for Researchers

One of the primary contributions of this research investigation is the examination of the constructs of online dating, empathy, objectification of others, and quality of romantic relationships in combination. While some of these constructs have been examined in relation to one another, *no* identified study has studied all of the constructs simultaneously. Therefore, this research investigation provides new theoretical understanding of the constructs of interest and contributes to the literature regarding findings for each construct.

Additionally, the current research investigation follows recommendations made by researchers to examine specific online activities (i.e., online dating) as opposed to general online use (Best et al., 2014). Similarly, this research investigation also provides data further validating and supporting the use of various instruments with emerging adult populations (e.g., ODI, AMES [Vossen et al., 2015], and ECR-RS [Fraley et al., 2011]). Furthermore, no known instruments have been empirically supported to measure the intensity of an individual's use of online dating services, and this investigation's modification of Ellison and colleagues' (2007) FBI to measure this construct may provide a consistent and empirically supported instrument to for future researchers. While the SOOS resulted in successful data acquisition and did *not* succumb to problems reported by other researchers in the measurement of the objectification of others (Davidson et al., 2015; Linder et al., 2012), the instrument did *not* demonstrate strong psychometric properties with these data, further supporting a need for the development of a strong instrument to measure the objectification of others. Overall, this research study

contributed to the literature regarding the constructs of interests in this investigation and provided empirical support for the use of the assessment instruments to examine research questions. Recommendations for future research are offered.

Theoretical Framework

This research investigation is founded on the principles and tenets delineated in attachment theory (Ainsworth, 1989; Bowlby, 1969; 1973; 1980), interpersonal neurobiology (Badenoch, 2008; Siegel, 2010; 2012; 2013), and objectification theory (Fredrickson & Roberts, 1997; Szymanski, Moffitt, & Carr, 2011), as well as social trends identified in SCT use (Lenhart, 2015) and online dating (Smith & Duggan, 2013). The following section provides a brief overview of these constructs.

Attachment Theory and Quality of Romantic Relationships

Scholars have examined attachment theory with a variety of populations spanning age groups (Zilberstein, 2014), and it is considered its own therapeutic model for client treatment as well as a key component of many integrative therapies (Gold, 2011). The central concept in attachment theory is that an infant's survival – and thus feelings of safety and security – revolve around the availability and response of a supportive caregiver (Ainsworth, 1989; Bowlby, 1982). Thus, infants with responsive and supportive caregivers develop *secure* attachment, leading to feelings of self-worth and a positive view of the world (Ainsworth & Bowlby, 1991).

In contrast, infants develop *insecure* attachment patterns when caregivers are inconsistent or nonresponsive (Ainsworth, Blehar, Waters, & Wall, 1978). Specifically, children who have inconsistent caregivers tend to have *anxious-ambivalent* attachment styles in which an individual develops an inconsistent view of one's self as having self-worth and inconsistent feelings of the world and others being safe and trustworthy (Ainsworth et al., 1978). Children who have attachment figures who are unresponsive tend to develop *avoidant* attachment styles in which they have feelings of being unworthy and views of the world as unsafe and rejecting (Ainsworth et al., 1978).

Researchers determined two orthogonal factors to predict attachment styles (Brennan, Clark & Shaver, 1998; Mikulincer & Shaver, 2007): (a) *attachment anxiety*, and (b) *attachment avoidance*. Whereas, an individual with anxious attachment fears that an attachment figure or romantic partner would be unavailable when needed, and an individual with avoidant attachment would *not* trust that an attachment figure or partner would be helpful when needed. As it relates to the current investigation, attachment styles are formed in infancy and are relatively stable in providing the foundation for one's beliefs about one's self and others – even in romantic relationships where partners are related to as early attachment figures (Bowlby, 1982; Hazen & Shaver, 1987). Shaver and Hazan (1993) identified that individuals with a secure attachment report greater satisfaction in romantic relationships and have more positive relationship qualities. Similarly, Kirkpatrick and Davis (1994) identified that individuals with insecure attachment styles experienced lower levels of satisfaction and stability in romantic relationships, as well as lower levels of trust and intimacy. Furthermore, individuals with

insecure attachment styles experience greater levels of jealousy and are more likely to perceive threats to their romantic relationship (Buunk, 1997; White & Mullen, 1989).

Overall, researchers identified attachment styles as relatively stable, yet vulnerable to change depending on life experiences (Waters, Merick, Treboux, Crowell, & Albertsheim, 2000). Furthermore, attachment styles are a viable measure of romantic relationship quality (Pistole, 1989), as attachment styles are related to an individual's level of commitment, trust, relationship satisfaction, and emotional experience in a romantic relationship (Simpson, 1990). Therefore, paired with a measure of relationship satisfaction (e.g., RAS; Hendrick, 1988), attachment theory's dimensions of anxious-ambivalent attachment and avoidant-attachment provide a sound theoretical foundation for understanding emerging adults' quality of romantic relationships.

Interpersonal Neurobiology and Empathy

The major tenets of interpersonal neurobiology revolve around the concept of neuroplasticity (Badenoch, 2008; Siegel, 2010), in which the behaviors that an individual practices physically restructure the individual's brain to be more efficient towards those practiced behaviors (Siegel, 2010; 2012). Emerging adulthood is a period of time ripe for brain development (Siegel, 2013) through the process of neurogenesis (i.e., the creation of neurons in response to novel experience), synaptogenesis (i.e., the establishing of connections between neurons), the laying down of myelin sheathing (i.e., tissue that overlaps synapses to accelerate movement of electric signals in the brain), and pruning (i.e., the atrophy and reduction of unused neurons). As it relates to the current research

investigation, there is concern that emerging adults' regular use of online technology, heavily based in nonverbal communication (Riva, 2002), might be impairing their empathic development (Siegel, 2013).

Empathy is difficult for researchers to define (Spreng, McKinnon, Mar, & Levine, 2009), but it has been identified as having both cognitive and affective components (Davis, 1980; 1983). Empathy development is a crucial task in childhood and adolescence (McDonald & Messinger, 2011; Soenens, Duriez, Vantsteenkiste, & Goosens, 2007), and that it can viably predict social variables in later life (Allemand, Steiger, & Fend, 2015). Indeed, research supports that empathy is important in individuals' conflict resolution skills (de Wied, Branje, & Meeus, 2007), capacity to forgive (McCullough, Worthington, & Rachal, 1997), and social competence – resulting in being more liked by peers and more likely to help others (Eisenberg et al., 2009).

Beyond social variables, empathy is an essential component of developing healthy interpersonal relationships (Szalavitz & Perry, 2010) and the success of romantic relationships (Cramer & Jowett, 2010; Levenson & Gottman, 1985; Thomsen & Gilbert, 1998). Individuals who possess empathy are more in synch with their partners during times of conflict (Thomsen & Gilbert, 1998) and more accurately evaluate the negative emotional experience of their partner (Levenson & Ruef, 1992). As such, researchers have called for interventions that promote empathy development in romantic couples (Coutinho, Silva, & Decety, 2014) and further exploration of the relationship between attachment style and empathy (Mikulincer, Shaver, Gillath, & Nitzberg, 2005).

In summary, empathy is central to individuals' quality of life (Mavroveli, Petrides, Rieffe, & Bakker, 2007), and empathy deficits are associated with dangerousness in individuals (Ali, Amorim, & Chamorro-Premuzic, 2009). Furthermore, empathy is important in the development and maintenance of successful romantic relationships (Cramer & Jowett, 2010; Levenson & Gottman, 1985). However, researchers have expressed concern that, overall, empathy has been declining in emerging adults since the year 2000, with some researchers believing the empathic decline is associated with increases in technology use and online communication (Konrath et al., 2011).

Objectification Theory

A prerequisite of empathy is the humanization of another individual (Fiske, 2009). However, researchers have theorized that the hypersexuality of western culture results in individuals' adoption of cultural standards of beauty, placing an emphasis on physical traits over personhood (Fredrickson & Roberts, 1997). Consequently, individuals who compare themselves to cultural standards of beauty engage in a process of self-objectification, which is associated with a variety of clinical issues including depression, anxiety, and disordered eating (Maradi & Huang, 2008; Szymanski et al., 2011). Researchers have further examined associations with self-objectification and identified a relationship with the objectification of others (Strelan & Hargreaves, 2005).

Researchers identified that those who self-objectify are more likely to also objectify others (Strelan & Hargreaves, 2005); thus, resulting in a cycle of objectification

(Davidson et al., 2015; Linder et al., 2012). In the cycle of objectification, individuals adopt others' view and emphasis on physical traits to evaluate one's self and also evaluate others in comparison to one's self (Davidson et al., 2015). However, through the objectification of others, the individuals being objectified perpetuate the cycle by also adopting self-objectifying views of themselves and then continuing to objectify others as well.

While objectification theory originally focused on women's experience of self-objectification (Fredrickson & Roberts, 1997), researchers expanded the scope of objectification theory to include couples, men, and minority groups' experiences as well (Heimerdinger-Edwards, Vogel, & Hammer, 2011). Beyond perpetuating the clinical issues associated with being objectified (Moradi & Huang, 2008), researchers identified that those who objectify others treat others as if they lack mental capacity and moral status associated with humanity (Loughan et al., 2010). In addition to the relationship with self-objectification, associations have been established between other-objectification and age (Swami et al., 2010), identifying that the objectification of others might be especially relevant to present-day emerging adults.

As it relates to romantic relationships, researchers have identified associations between objectification of others and attachment styles (DeVille et al., 2015), and decreased satisfaction in romantic relationships (Zubriggen et al., 2011). However, a review of the literature finds that the construct of other-objectification is understudied in association with romantic relationships, despite researchers' call for more research related to objectification in broader social context (Szymanski & Carr, 2011).

Furthermore, researchers have recommended a return to examining intrapsychic processes associated with objectification (Fischer, Bettendorf, & Wang, 2011). Therefore, this study follows recommendations made by researchers to study objectification in the social context of online dating and to focus on the intrapsychic process of empathy.

Social Communication Technology and Online Dating

The use of technology and the Internet has been debated amongst researchers for its unique ability to allow individuals to communicate publicly or privately in the immediate or in delayed form (Barak, 2007). Other researchers have emphasized that SCT may *not* threaten social communities but actually strengthen relationships (Bargh & McKenna, 2004). Nonetheless, SCT has been criticized for its ability to enable behaviors that create intimacy problems (Hertlein & Stevenson, 2010) and to promote communication without nonverbal cues (Riva, 2002). Researchers held the view that online communication is weaker than face-to-face communication as a form of interaction (Best et al., 2014). Researchers examined emerging adults' use of social communication technology with a variety of constructs and reported mixed findings and encouraged future researchers to investigate specific online activities as opposed to general online use (Best et al., 2014).

Online dating is one form of online activity gaining in popularity (Smith & Duggan, 2013); however, research related to online dating is still in its infancy. For example, McKenna, Green, and Gleason (2002) found that participants ($N = 567$) had only been using the Internet for an average of 34 months at the time of survey, indicating

that, the Internet – and consequently online dating – have not historically had the cultural relevance they currently have. Comparing American use of online dating services from 2005 ($N = 3,215$) to 2013 ($N = 2,252$), Smith and Duggan (2013) identified a 15% increase (44% to 59%) in Americans' belief that online dating is a good way to meet people.

Thus far, researchers have examined the experiences of online daters (Heino et al., 2010), as well as the characteristics (Blackhart et al., 2014; Kim, Kwon, & Lee, 2009), and practices of those who use online dating services (Hitsch et al., 2006). Researchers have concluded that, online daters are similar to traditional daters, except in the sense that online daters place greater emphasis on physical attractiveness of potential partners (Rosen et al., 2008). Further, researchers identified online dating as promoting the evaluation of potential partners (Sritharan et al., 2010) and the consequential promotion of self-objectification and other-objectification (Hitsch et al., 2006). Furthermore, researchers further identified that online dating promotes an element of fantasy (Arvidsson, 2006), in which online daters project an identity onto a potential partner (Ramirez, Sumner, Fleuriet, & Cole, 2015). In combination, it would appear that online daters – who are more prone to objectify others and potential partners – project identities onto a potential partner and then evaluate him or her as to whether or not the individual fits the projected identity.

In light of the tenets of interpersonal neurobiology, emerging adults who use online dating services are using their brains more to evaluate (i.e., objectify) others than to empathically connect with them, thus impairing their ability to form and maintain

healthy romantic relationships. Collectively, the existent literature regarding the associations between online dating, empathy, other-objectification, and quality of romantic relationships with emerging adults is limited. Therefore, the purpose of this investigation was to examine the influence of emerging adults' online dating on their levels of empathy, objectification of others, and quality of relationships with romantic partners.

Operational Definitions

Affective Empathy

Affective empathy is “[...] the experience of another person’s emotional state” (Vossen et al., 2015, p. 66). Affective empathy is typically measured by the construct of *Empathic Concern* (EC; Davis, 1980). EC involves “[...] compassionate, sympathetic responses to others’ misfortunes” (van Lissa, Hawk, de Wied, Koot, & van Lier, 2014, p. 1219).

Anxious Attachment

Simpson (1990) described anxious attachment – or “anxious/ambivalent” attachment – as “[...] characteristic of infants who intermix attachment behaviors with overt expression of protest and anger toward the primary caregiver when distressed” (p. 971). Simpson further elaborated, “those who display an anxious style tend to develop models of themselves as being misunderstood, unconfident, and underappreciated and of

significant others as being typically unreliable and either unwilling or unable to commit themselves to permanent relationships” (p. 971).

Attachment Styles

Attachment styles – or “attachment patterns” – are defined as “[...] specific behavioral and emotional propensities designed to keep infants in close physical proximity to their primary caregivers” (Simpson, 1990, p. 971). While Simpson’s definition relates specifically to infants and their caregivers, it is necessary to note that attachment behaviors and emotional experiences translate into emerging adulthood as well, where individuals will work to maintain comfortable closeness or distance from one’s romantic partner, mirroring patterns of closeness or distance between an infant and his/her attachment figure established in infancy (Bowlby, 1982; Hazen & Shaver, 1987).

Avoidant Attachment

Simpson (1990) described avoidant attachment as “[...] characteristic of infants who avoid the caregiver and exhibit signs of detachment when distressed” (p. 971). Furthermore, “[...] those who have an avoidant style typically develop models of themselves as being suspicious, aloof, and skeptical and of significant others as being basically unreliable or overly eager to commit themselves to relationships” (p. 971).

Cognitive Empathy

Cognitive empathy is “[...] the comprehension of another person’s emotions” (Vossen et al., 2015, p. 66). Cognitive empathy is typically measured by the construct of

Perspective Taking (PT; Davis, 1980). Perspective taking is “[...] a cognitive empathy dimension that involves understanding others’ viewpoints (Davis, 1983)” (van Lissa et al., 2014, p. 1219).

Emerging Adults

Emerging adults are individuals between the ages of 18 and 29 years old (Arnett, 2000; 2004; Arnett & Tanner, 2006; Tanner, Arnett & Leis, 2009).

Empathy

Empathy consists of both cognitive and affective components (Davis, 1983). Empathy relates to an individual’s understanding of another individual’s thoughts and feelings in a situational context (Rogers, 1980). In this study, “empathy is the ability to share and understand others’ thoughts and feelings (Eisenberg & Fabes, 1990; Hoffman, 2000)” (Allemand et al., 2015, p. 229).

Objectification

Objectification is the *object-ifying* of another individual from person to an object (Heflick & Goldberg, 2014). An individual experiencing objectification is “[...] treated as *a body* (or collection of body parts) valued predominantly for its use (or consumption by) others” (Fredrickson & Roberts, 1997, p. 174).

Objectification of Others

Objectification of others, or “other-objectification,” is defined in this research investigation as “[...] perceivers’ tendency to attribute more importance to visible, appearance-related body features ... than to non-visible, competence-related body features” (Piccoli, Cobey, & Carnaghi, 2014, p. 45).

Online Dating

This investigation defines online dating as use of any Internet website or cell phone application where an individual can create a profile and contact others as potential romantic partners for the purpose of sexual activity, dating, or forming romantic relationships.

Quality of Romantic Relationships

For this investigation, quality of romantic relationships is determined by relationship satisfaction (as measured by the RAS [Hendrick, 1988]) and attachment style (e.g., *secure*, *anxious*, *avoidant*; Pistole, 1989) through inferences that can be made about commitment, trust, relationship satisfaction, and emotional experiences in a relationship (Simpson, 1990).

Secure Attachment

Simpson (1990) described secure attachment as “[...] characteristic of infants who successfully use the caregiver as a secure base when distressed” (p. 971). Simpson further described, “people who possess a secure attachment style tend to develop mental models

of themselves as being friendly, good-natured, and likable and of significant others as being generally well intentioned, reliable, and trustworthy” (p. 971).

Self-Objectification

“Objectification theory (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996) is an influential feminist theory that describes the process whereby individuals who are subjected to such objectification come to internalize the perspective of the outsider, a phenomenon called ‘self-objectification’” (Zurbriggen et al., 2014, p. 449). Self-objectification is defined as “the act of taking on an observer’s perspective when thinking about one’s own body” (Linder et al., 2012, p. 222).

Social Communication Technology

Social communication technology (SCT) is a term unique to this research investigation, created as an effort to synthesize previous researchers’ work regarding “communication technology” (Cyr et al., 2015), “social technology use” (Fletcher & Blair, 2014), “information and communication technologies” (Craig, McInroy, McCready, DiCesare, & Pettaway, 2015). SCT is defined in this research investigation as any technology used in a social and interpersonal context (e.g., texting, instant messaging, social media) to facilitate communication between two or more people.

Sympathy

Sympathy is defined as “[...] feeling concern or sorrow about distressful events in another person’s life (Clark, 2010)” (Vossen et al., 2015, p. 67). Differentiating sympathy

from empathy, Szalavitz and Perry (2010) described, “[...] while you understand what others are going through, you don’t necessarily feel it yourself” (p. 13).

Research Hypothesis and Exploratory Research Questions

The purpose of this investigation was to examine the directional relationship between emerging adults’ use of online dating services (e.g., websites and applications), levels of empathy and objectification of others, and quality of relationships with romantic partners. The following research questions and hypotheses guided this investigation:

Primary Research Question

Do emerging adults’ use of online dating websites and applications (as measured by the ODI) contribute to their levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS, and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988])?

Research Hypothesis

Emerging adults’ intensity of use of online dating services (as measured by the ODI) contributes to levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS), and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]). Specifically, emerging adults’ greater intensity of online dating service use

contributes to (a) decreased levels of empathy, (b) increased levels of objectification of others, and (c) decreased quality of relationships with romantic partners (see Figure 1).

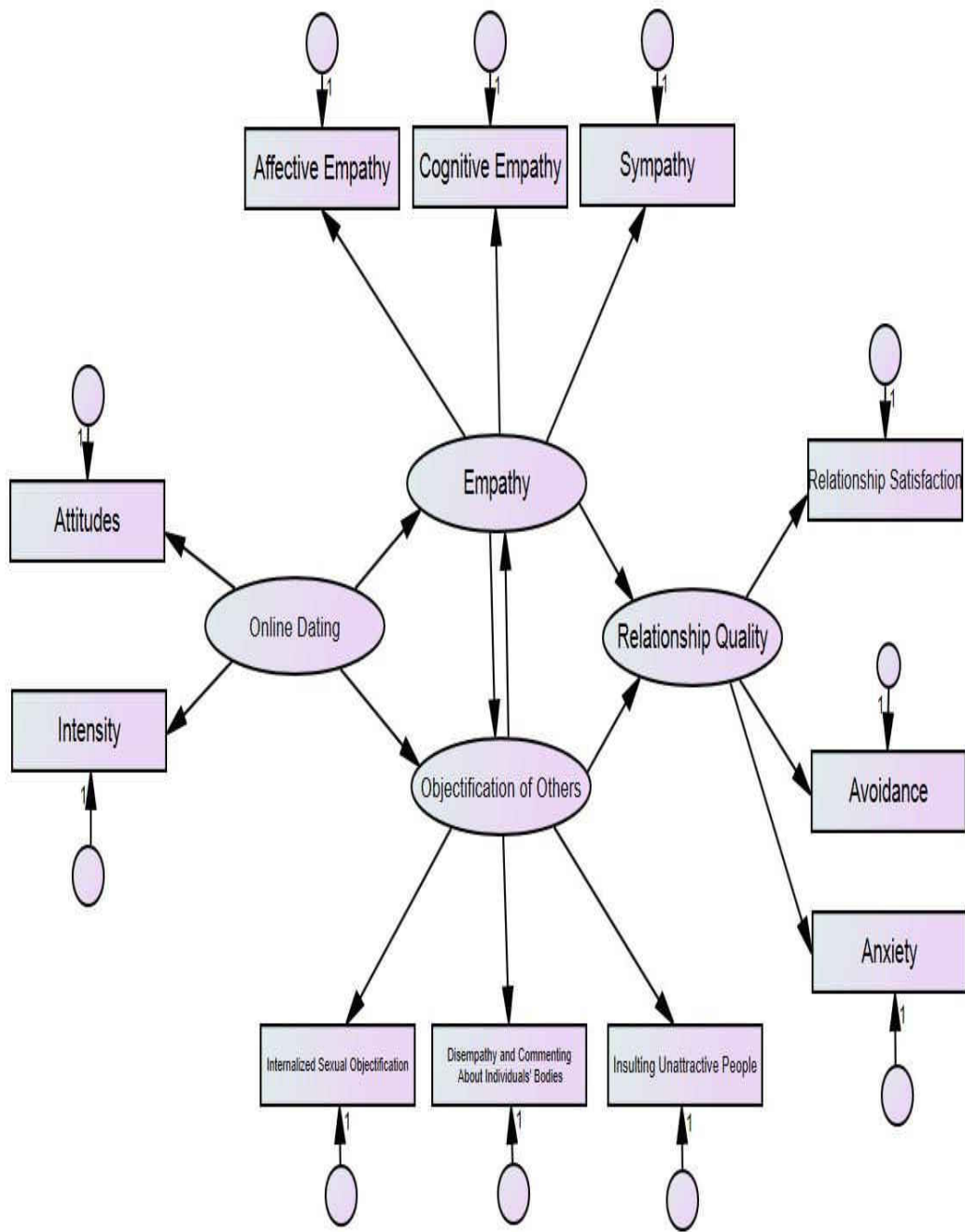


Figure 1: Hypothesis

Exploratory Research Questions

1. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) the online dating website or application (e.g., eHarmony, OkCupid, Tinder) emerging adults use for online dating?
2. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) their reported demographic variables (e.g., age, gender, ethnicity, year in college, geographic location, sexual orientation)?
3. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) with (or and) their scores of social desirability (as measured by the MCSDS-A (Reynolds, 1982)?

4. Is there a difference between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) based on the data collection method?

Research Design

This study followed a descriptive, correlational research design to investigate the hypothesis and questions of this investigation. Correlational research examines the relationship between multiple variables without any manipulation (Gall et al., 2007). Correlational methods can be used to determine the strength and direction of relationships between variables; however, correlational research does *not* indicate causation between variables (Graziano & Raulin, 2007). Nonetheless, researchers can use correlational research designs to investigate potential cause and effect relationships between constructs and predictive outcomes (Tabachnick & Fidell, 2013). Correlational research is often used in the counseling literature, though researchers recommend the use of more advanced correlational analyses (e.g., SEM) to explain complex relationships between variables (Crocket, 2012; Quintana & Maxwell, 1999).

Research Method

The following section delineates the following components of this study: (a) population and sampling procedures, (b) data collection procedures, (c) measurement and instrumentation, (d) data analysis methodology, (e) ethical considerations, and (f) study limitations.

Population and Sampling

In 2013, there were approximately 13,078,512 emerging adult (18-29 years old) college students in the United States (U.S. Department of Education Institute of Education Sciences National Center for Education Statistics, 2014). It is necessary to determine appropriate sample size prior to data collection in order to account for population representation and statistical power (Gall et al., 2007), and participant response rates (Shih & Fan, 2009). Beginning with population representation, larger sample sizes increase generalizability of the target population (Gall et al., 2007).

The researcher utilized Structural Equation Modeling (SEM; Tabachnick & Fidell, 2013) to examine the theoretical model that emerging adults' use of online dating services influences their levels of empathy, objectification of others, and quality of relationships with their romantic partners. In order to avoid making a Type II error (i.e., failing to reject a false null hypothesis; Balkin & Sheperis, 2011), the researcher conducted a power analysis *a priori*. Schumaker and Lomax (2010) recommended using www.Danielsoper.com (sample size calculator) to calculate *a priori* sample size for SEM. Based on this website, a minimum sample size of 387 was required to identify a small

effect size (0.1) at a high power (.8) with four latent variables (e.g., *Online Dating, Empathy, Objectification of Others, Relationship Quality*) and 11 manifest variables (e.g., *Attitudes, Intensity, Affective Empathy, Cognitive Empathy, Sympathy, Internalized Sexual Objectification, Disempathy and Commenting About Individuals' Bodies, Insulting Unattractive People, Relationship Satisfaction, Avoidance, Anxiety*) at the probability of $p < .05$. Thus, based on SEM sample size best practices (e.g., Quintana & Maxwell; Raykov Marcoulides, 2006; Schumaker & Lomax, 2010), the researcher deemed a minimum sample size of 500 completed data collection packets sufficient for this SEM research investigation in order to identify a small affect size at a high statistical power.

Sampling procedure. The population of interest in this investigation was emerging adults. The identified sample for this study included *all* emerging adult undergraduate or master's level college students between the ages of 18 and 29 enrolled at a college or university in the United States regardless of gender, race or ethnicity, or any other demographic variable. Because the entire population was unavailable for sampling, convenience sampling was pragmatic and satisfactory (Gall et al., 2007). Therefore, a convenience sample of emerging adult undergraduate or master's level students enrolled in various colleges and universities throughout the United States were invited to participate in this study through personal and professional contacts of the primary researcher, including students from (a) East Carolina University, (b) Florida Gulf Coast University, (c) Georgia State University, (d) Rollins College, (e) Stetson University, (f) The University of Central Florida, (g) University of North Carolina at Charlotte, (h)

University of San Diego, and (i) Valencia College. To achieve a minimum sample of over 500 completed data collection packets, the researcher anticipated response rates of online potential participants at about 10% (Pike, 2008; Shih & Fan, 2009) and face-to-face participants at about 90% (Blount, 2015; Mullen, 2014). Thus, in order to meet the minimum sample size of at least 500 completed data collection packets, a minimum of 700 physical data packets were distributed for face-to-face data collection and a pool of about 10,153 potential participants were invited to participate online.

Data Collection Procedures

Prior to any data collection, the researcher received approval from the University of Central Florida's (UCF) Institutional Review Board (IRB), as well as approval from the IRB of East Carolina University (see appendices A and B). The IRB of other colleges and universities determined UCF's IRB approval of the study to be sufficient for ethical recruitment of potential participants. The researcher submitted an application to IRB including (a) Human Research Protocol form, (b) a copy of informed consent, and (c) all measurement and assessment instruments including the demographic form. Second, the researcher chose research instruments that were appropriate to answer the research questions of the investigation. Research instruments used in this investigation were free and available online and did not require author permission (e.g., SOOS, MCSDS-FA). Nonetheless, the researcher received approval from the authors of several of the data collection instruments modified or used in the study: (a) FBI (personal communication with Dr. Ellison, July, 10, 2015); (b) AMES (personal communication with Dr. Vossen,

July, 10, 2015); (c) ECR-RS (personal communication with Dr. Fraley, July, 9, 2015), and (d) RAS (personal communication with Dr. Hendrick, July, 26, 2015). Authors of these instruments also granted permission to alter their instrument in any way the researcher deemed necessary as well as to transfer the instruments to Qualtrics (www.qualtrics.com) for online survey distribution. Furthermore, to reduce measurement error, the researcher distributed physical data collection packets and the online survey link to four dissertation committee members and six doctoral student colleagues prior to data collection to confirm the legibility and parsimony of the measurement instruments and the demographic forms (Dillman, Smyth, & Christian, 2009). The researcher implemented identified concerns to the survey regarding this feedback (e.g., readability, instruction). Data collection followed two forms: (a) web-based survey and (b) face-to-face administration.

Data collection initiated on September 3, 2015 following Dillman and colleagues' (2009) *Tailored Design Method* – a survey method designed to increase participant motivation to respond by establishing trust, increasing perceived benefits of participation, and decreasing the perceived cost of participation. To establish trust with potential participants, the researcher pursued endorsement for this research project through involved universities and faculty members and, through informed consent, assured potential participants that their information would be treated confidentially and anonymity would be protected. To decrease potential participants' perceptions of cost, the researcher made the survey convenient and accessible, avoided the use of technical

language, and minimized solicitation of personal or private information (Dillman et al., 2009).

Some participants were recruited through the University of Central Florida (UCF) psychology department's SONA system. Students registered through SONA could view the title of the research study and follow a unique access link leading to the Qualtrics survey including (a) informed consent; (b) general demographic form; and (c) assessment instruments (e.g., AMES [Vossen et al., 2015]; ODI; SOOS; ECR-RS [Fraley et al., 2011], RAS [Hendrick, 1988], and MCSDS-FA [Reynolds, 1982]). Following recommendations made by Dillman and colleagues (2009), the informed consent included a friendly tone, reminded potential participants of the importance of their participation, and included the researcher's contact information. Data collection closed on November 1st, 2015, allowing for an eight-week window of opportunity for potential participants to participate in this research study, as recommended by the researcher's faculty supervisor from the UCF's psychology department (personal communication with Dr. Jentsch, July 27, 2015).

In addition to web-based survey through UCF's SONA system, the researcher scheduled dates with professors at various college and universities to collect data through undergraduate and master's level classrooms. Professors agreed to assist the researcher in either collecting data through face-to-face survey packet distribution or electronically by sharing an online survey link to students. Potential participants had the option to opt out of participation or to withdraw at any time from the study. Professors who chose to distribute the survey to students online sent an email to potential students with a copy of

the informed consent and a link to the online survey site (e.g., Qualtrics). Students had the option to participate or not.

Regarding face-to-face data collection, potential participants received an envelope without identifying information that included the general demographics form, the ODI, the AMES, (Vossen et al., 2015), the SOOS, the ECR-RS (Fraley et al., 2011), the RAS (Hendrick, 1988) and the MCSDS-FA (Reynolds, 1982). Participants who chose *not* to participate returned an incomplete or blank envelope, while participants who chose to participate completed the data collection packet in the envelope. The researcher assigned a number to completed data packets and entered the data into the *Statistical Program Systems 20th edition* (SPSS, 2011). The researcher did *not* collect identifying information (e.g., name, student id). Thus, having utilized both online web-based survey and face-to-face administration, the researcher applied rigorous data collection procedures to ensure heterogeneity in the sample and geographic representation.

Instrumentation

The researcher utilized seven data collection instruments for this research investigation, including: (a) *general demographic form*, (b) The ODI, (c) AMES (Vossen et al., 2015), (d) SOOS, (e) ECR-RS (Fraley et al., 2011), (f) RAS (Hendrick, 1988), and (g) MCSDS-FA (Reynolds, 1982). The instruments were made available online for free and for public use. Nonetheless, the researcher received permission from the authors of several of the instruments (see appendices L, M, N, and O) to manipulate them and to use them electronically (e.g., www.qualtrics.com). The instruments (see appendices E, F, G,

H, I, J, and K) were combined into a digital data collection packet and distributed to potential participants electronically or in physical data collection packets.

General Demographic Questionnaire

The researcher included a general demographics questionnaire to collect participant data related to various demographic variables (e.g., age, gender, and ethnicity). Additionally, the general demographics questionnaire included items related to the quantity of online dating services used by an individual and asked participants to identify which online dating services they used. The general demographics questionnaire listed 16 possible services that were a combination of the most popular online dating services (e.g., eHarmony, OkCupid) and telephone applications (e.g., Tinder, Grindr) as of June and July of 2015 (Corpuz, 2015; “Top 15”, 2015).

Online Dating Intensity Scale (ODI)

A review of the literature identified that the majority of researchers created their own instruments to measure technology use (e.g., Cyr, Berman & Smith, 2015; Ohannessian, 2009; Reich, Subrahmanyam, & Espinoza, 2012) rather than using a consistent and empirically supported assessment instrument. In order to use an empirically supported instrument for this investigation, the researcher reviewed the literature for instruments that measured similar constructs to intensity of online dating and identified the FBI (Ellison et al., 2007) as an established measure for a similar construct. The FBI (Ellison et al., 2007) is a one-factor self-report instrument consisting of nine items on a five-point Likert-scale ranging from *Strongly Disagree* to *Strongly*

Agree, with a neutral “*Not Applicable*” option. The FBI was designed to measure the intensity of an individual’s Facebook use. Sherrell (2014) performed an exploratory factor analysis (EFA) with a sample of undergraduate college students ($N = 717$), resulting in a two-factor solution (a) *Emotional Connectedness* ($\alpha = .89$, 47.04% of the variance explained), and (b) *Friends* ($\alpha = .77$, 14.71% of the variance explained) that explained 61.75% of the total variance. Therefore, in order to measure the intensity of use of online dating services as a construct, with permission from the author (personal communication with Dr. Ellison, July, 10, 2015), the researcher modified the FBI for use in this study (see Dimitrov, 2012).

The FBI was used in a series of studies with undergraduate college students with internal consistency scores ranging from 0.83 ($N = 286$, Ellison et al., 2007) to 0.89 ($N = 2,603$; Valenzuela, Park & Lee, 2009), with other studies reporting internal consistencies of 0.84 ($N = 103$; Orr et al., 2009), 0.85 (53.37% of the variance accounted for, $N = 222$; Lou, Yan, Nickerson, & McMorris, 2012), and 0.86 ($N = 373$; Lampe, Wohn, Vitak, Ellison, & Wash, 2011). Researchers have modified use of the FBI by altering the words of items or reducing the number of items and still achieved strong internal consistency ($N = 246$; $\alpha = 0.92$; Park & Lee, 2014). Sherrell (2014) conducted an EFA and identified a two-factor structure with the removal of item six that resulted in a Cronbach’s α of 0.89 for the first factor structure, *Emotional Connectedness* (Items 1, 2, 3, 4, 5, and 7) and a Cronbach’s α of 0.77 for a second factor labeled *Friends* (Items 8 and 9). With a two-factor solution and the removal of item six, the eight-item assessment had an internal

consistency between 0.53 and 0.92, which the researcher deemed satisfactory (Kline, 2011).

In forming the ODI from the FBI, the researcher implemented feedback received from the creator of the FBI (personal communication with Dr. Ellison, July, 10, 2015). For example, the researcher retained only three items measuring attitudes about using online dating services and modified items to measure specific activities of online dating in regard to quantity, frequency, and duration of use. The researcher anticipated the ODI measurement model to contain two factors (a) *attitudes* and (b) *intensity*, consisting of 10 items (see Figure 2).

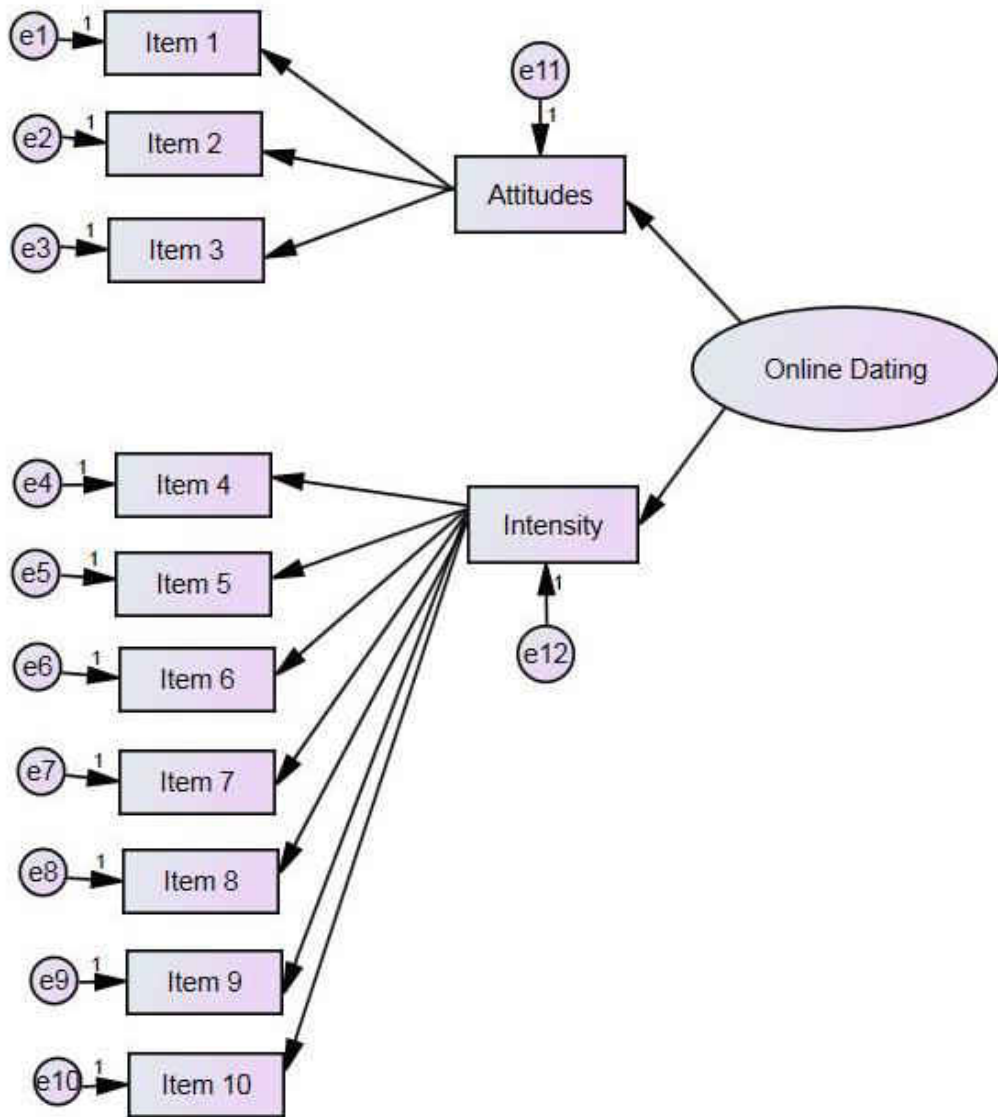


Figure 2: Anticipated Measurement Model for the ODI

Adolescent Measure of Empathy and Sympathy (AMES)

The AMES is an assessment that measures empathy and was designed to address problems related to other measures of empathy including ambiguous wording and confounded measures of sympathy (Vossen et al., 2015). The AMES is a 12-item empathy assessment with three factors consisting four items per factor (a) *Cognitive Empathy*, (b) *Affective Empathy*, and (c) *Sympathy*. Participants respond to each item on a 5-point Likert scale ranging from (1) never, (2) almost never, (3) sometimes, (4) often, and (5) always. *Affective Empathy* scores are calculated by averaging items 5, 7, 9, and 12; *Cognitive Empathy* scores are calculated by averaging items 1, 3, 8, and 10; and *Sympathy* scores are calculated by averaging items 2, 4, 6, and 11.

The AMES was normed in two studies with Dutch adolescents (Vossen et al., 2015). In the first study ($N = 499$; 10-15 years old; 52% male, 48% female), the AMES was reduced to 12 items from 19 items, with four items per factor (a) *Cognitive Empathy* ($\alpha = 0.86$), (b) *Affective Empathy* ($\alpha = 0.75$), and (c) *Sympathy* ($\alpha = 0.76$). The affective empathy and cognitive empathy factors correlated at 0.34. The affective empathy factor and sympathy factors correlated at 0.39, and the cognitive empathy and sympathy factors correlated at 0.54. In total, the three-factor structure accounted for 54.4% of the variance, which is near the recommended 60% of variance accounted for in a strong instrument (Hair et al., 2010).

In a second study (Vossen et al., 2015) with a sample of 450 Dutch adolescents between the ages of 10-15 (50% male, 50% female), a subsample of participants ($n = 248$) completed the assessment a second time two-weeks later. Test-retest reliability was

established and correlations were calculated per each factor (a) *affective empathy* ($r = 0.56$), (b) *cognitive empathy* ($r = 0.66$), and (c) *sympathy* ($r = 0.69$). Furthermore, participants in this study also completed the *Empathic Concern* and *Perspective Taking* subscales of the *Interpersonal Reactivity Index* (IRI; Davis, 1980); the *Strengths and Difficulties Questionnaire* (SDQ; Van Widenfelt, Goedhart, Treffers, & Goodman, 2003), and an adapted form of the *Aggression Questionnaire* (AQ; Buss & Perry, 1992). Vossen and Colleagues used CFA and identified an acceptable fit with three factors (RMSEA = .07 (90% [CI]: .06/.08), CFI = .94, TLI = .92). To test construct validity, the IRI's *empathic concern* subscale (Davis, 1980) was correlated with all three subscales of the AMES (e.g., affective empathy [$\alpha = 0.29$], cognitive empathy [$\alpha = 0.42$], and sympathy [$\alpha = 0.63$]; Vossen et al., 2015). The IRI's *perspective taking* subscale also correlated with all three subscales of the AMES (e.g., affective empathy [$\alpha = 0.21$], cognitive empathy [$\alpha = 0.45$], and sympathy [$\alpha = 0.36$]; Vossen et al., 2015). All AMES subscales were positively related to pro-social behavior (e.g., affective empathy [$\alpha = 0.14$], cognitive empathy [$\alpha = 0.33$], and sympathy [$\alpha = 0.50$]; Vossen et al., 2015). In order to establish discriminant validity, the affective empathy ($\alpha = -0.12$) and sympathy ($\alpha = -0.36$) subscales were negatively correlated to physical aggressive behavior while cognitive empathy was unrelated ($\alpha = -0.07$). Therefore the researcher deemed the AMES as a reliable and valid measure for use in this investigation (see figure 3).

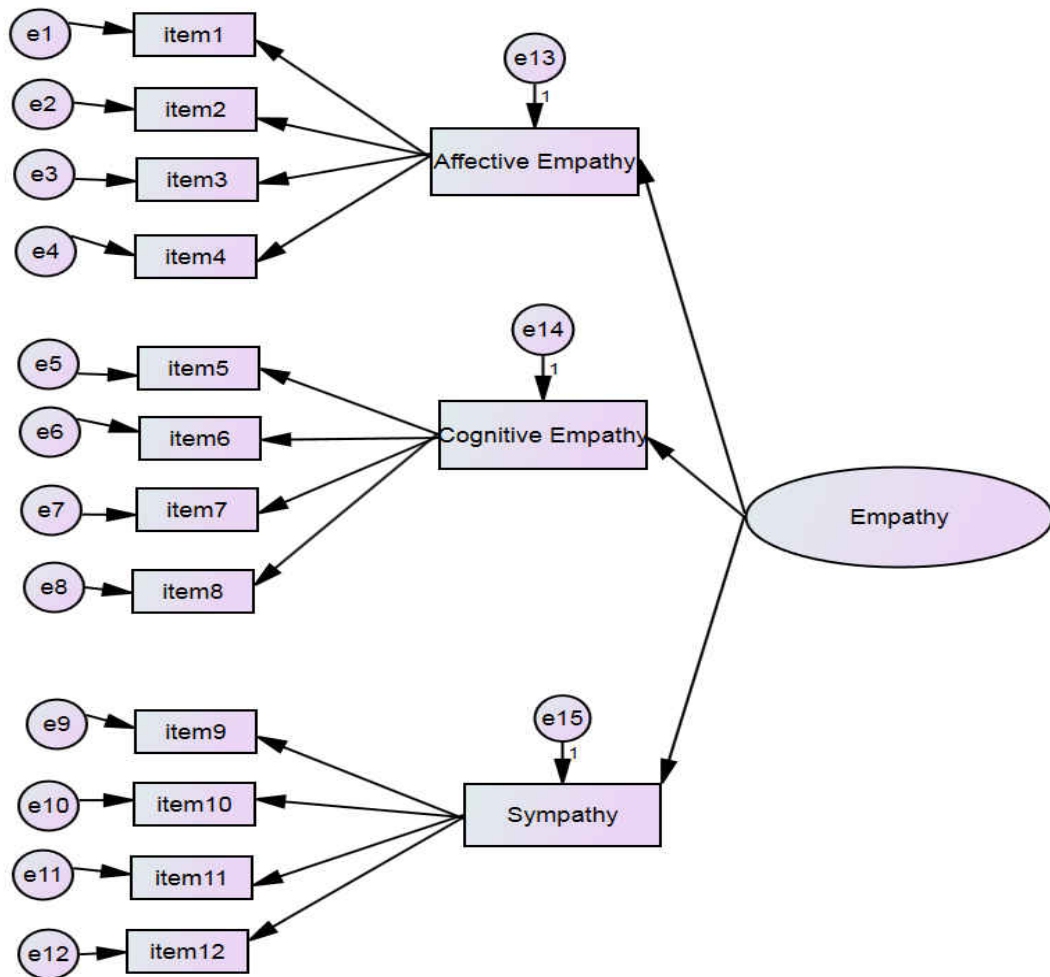


Figure 3: Measurement Model for the AMES

Sexual-Other Objectification Scale (SOOS)

The objectification of others (Linder, Tantleff-Dunn, & Jentsch, 2012; Strelan & Hargreaves, 2005) is an important part in the cycle of objectification (Davidson et al., 2015; Fredrickson & Roberts, 1997). However, few instruments measure the construct of other-objectification. Some researchers have measured the objectification of others by modifying McKinley and Hyde's (1996) *Objectified Body Consciousness Scale*

(Zurbriggen et al., 2011) or using the *Objectification of Others Questionnaire* (OOQ; Strelan & Hargreaves, 2005). However, both instruments have weaknesses (e.g., poor face validity, flawed data acquisition) that make them inappropriate for the current investigation.

A thorough literature view on the construct of other-objectification (see chapter 2) identified a lack of psychometrically sound instruments to measure the construct of the objectification of others. However, two students at Illinois Wesleyan University (Curran, 2004; Zolot, 2003) worked to develop a measure of men's objectification of women that the researcher deemed to be appropriate to modify for the current investigation. Zolot created a pool of about 60 items related to the objectification of others and distributed the 60-item assessment to 93 undergraduate students. Zolot and her research team conducted EFA and refined the 60-item assessment to a 25-item assessment ($\alpha = .89$) with four factors. Curran furthered the development of Zolot's instrument by the addition of several items and normed the instrument with a sample of 60 heterosexual male undergraduate participants. Curran and his research team conducted EFA and item analyses that resulted in a 22-item measure ($\alpha = .92$) with strong test-retest reliability $r(35) = 0.88, p < .01$. Furthermore, Curran also created a short-form of the instrument consisting of 12 items ($\alpha = .86$) with strong test-retest reliability $r(35) = .88, p < .01$. Both the long-form and short-form versions of the scales contain three factors: (a) *Internalized Sexual Objectification*, (b) *Disempathy and Commenting About Women's Bodies*, and (c) *Insulting Unattractive Women*. However, neither Zolot (2003) nor Curran (2004) acquired a large enough sample size to have the power to conduct an EFA (Hair et al.,

2010). Furthermore, Zolot and Curran designed their instrument to be used exclusively with heterosexual males. Therefore, this researcher modified the short-form instrument utilized by Curran to be gender-neutral, inclusive of gay and lesbian individuals, and shortened items that appeared long. The researcher renamed the three anticipated factors to reflect gender neutrality and inclusiveness: (a) *Internalized Sexual Objectification*, (b) *Disempathy and Commenting About Individuals' Bodies*, and (c) *Insulting Unattractive People*.

For this investigation, the researcher modified Zolot and Curran's instrument to measure an individual's objectification of potential sexual partners. While neither Zolot nor Curran named the instrument they developed, this author refers to this modified instrument as the *Sexual-Other Objectification Scale* (SOOS). The researcher considered the psychometric properties of the available measures of the objectification of others and determined the SOOS to be an appropriate instrument for use with a sample of emerging adults in this research investigation (see Figure 4).

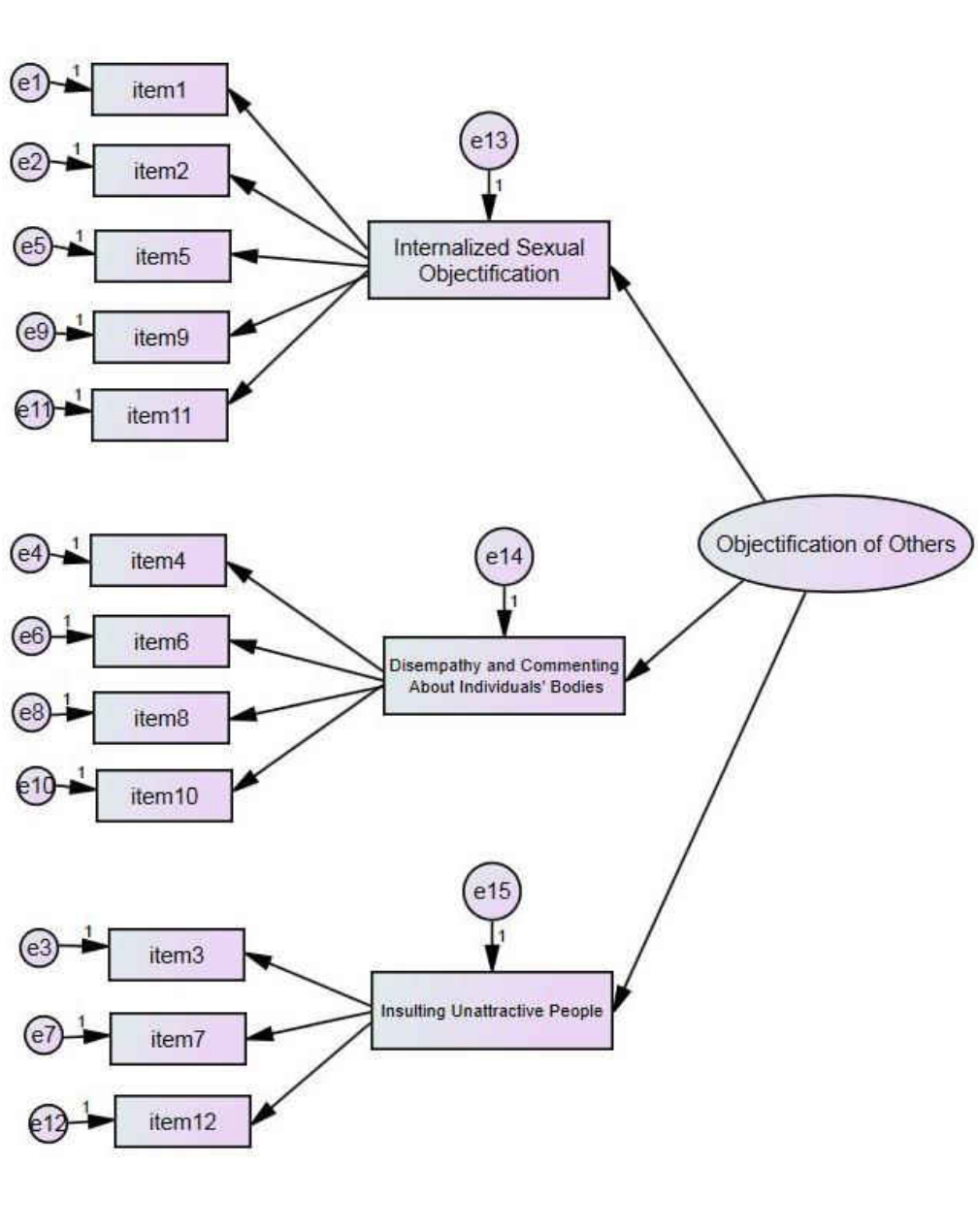


Figure 4: Measurement Model for the SOOS

Relationship Structure Questionnaire (ECR-RS)

The *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) was designed to measure an individual's attachment style. The ECR-RS was modified from *The Experiences in Close Relationships* (ECR; Brennan, Clark, & Shaver, 1998) and *The ECR-Revised* (ECR-R; Fraley, Waller, & Brennan, 2000). Fraley and colleagues (2011) addressed several problems that exist in self-report measures of adult attachment by allowing the researcher to specify the relationship being assessed, and reducing the number of items to make a shorter and more efficient assessment. The ECR-RS is a 9-item assessment consisting of two factors.

Fraley and colleagues (2011) normed their assessment with a sample of 21,838 individuals, with majority of the participants from the United States ($n = 14,781$) and other participants from Great Britain ($n = 1,852$), Canada ($n = 1,232$) or elsewhere. The authors distributed the assessment four times to participants in relation to maternal relationships, paternal relationships, romantic partner relationships, and friendships, resulting in a 40-item assessment. Fraley and colleagues (2011) explored the factor structure of the ECR-RS using principal axis factoring and varimax rotation. Across domains (e.g., maternal, paternal, romantic, friend), two factors represented the data and accounted for over 69% of the variance, which exceeds the recommended level of 60% (Hair et al., 2010). Fraley and colleagues (2011) removed one item for not being “a ‘clean’ measure” (p. 617) and identified a two factor structure (a) *Avoidance* ($\alpha = 0.88$; items 1-6 [items 5 and 6 are reverse-coded]), and (b) *Anxiety* ($\alpha = 0.85$; items 7-9). The Cronbach's alpha scores represent global scores per factor – a composite score per

participant in response to maternal, paternal, romantic, and friend relationships. The authors also presented internal consistency values for each factor per each relational measure (a) maternal (*Avoidance* $\alpha = 0.92$; *Anxiety* $\alpha = 0.88$), (b) paternal (*Avoidance* $\alpha = 0.90$; *Anxiety* $\alpha = 0.90$), (c) romantic (*Avoidance* $\alpha = 0.87$; *Anxiety* $\alpha = 0.91$), and (d) friend (*Avoidance* $\alpha = 0.88$; *Anxiety* $\alpha = 0.90$). Fraley and colleagues (2011) identified that the alpha reliability estimates were “highly comparable” to those of longer scales (e.g., ECR, ECR-R; p. 618).

In their second study, Fraley et al. (2011) surveyed 388 individuals in dating or marital relationships. The average age of participants was 22.59 years and consisted of mostly white (72.2%) women (65%). Participants completed the ECR-R (Fraley et al., 2000), the *Investment Model Scale* to measure relationship quality and functioning (IMS; Rusbult, Martz, & Agnew, 1998), the 9-item version of the *Center for Epidemiological Studies-Depression scale* to measure depressive symptoms (CES-D; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993), and the 44-item *Big Five Inventory* to measure individual differences (John & Srivastava, 1999). As it relates specifically to romantic partners, the authors also presented internal consistency values for each factor (*Avoidance* $\alpha = 0.81$; *Anxiety* $\alpha = 0.83$). The authors identified relationships between the ECR-RS *anxiety* subscales and ECR *anxiety* ($r = 0.66$) and *avoidance* subscales ($r = 0.31$), as well as relationships between the ECR-RS *avoidance* subscales and ECR *anxiety* ($r = 0.31$) and *avoidance* subscales ($r = 0.56$), demonstrating appropriate concurrent validity (Fraley et al., 2011).

While researchers demonstrated validity and reliability using the ECR-RS with diverse samples, the authors identified two main limitations with the assessment: (a) Few reverse-coded items exist and they are only on the *avoidance* subscale, and (b) like all attachment instruments, the ECR-RS is less successful at differentiating between people with secure attachment. Nonetheless, no known self-report instruments to measure attachment are infallible. Therefore, with evidence for validity and reliability, the researcher determined the ECR-RS to be an appropriate instrument for this research investigation (see Figure 5).

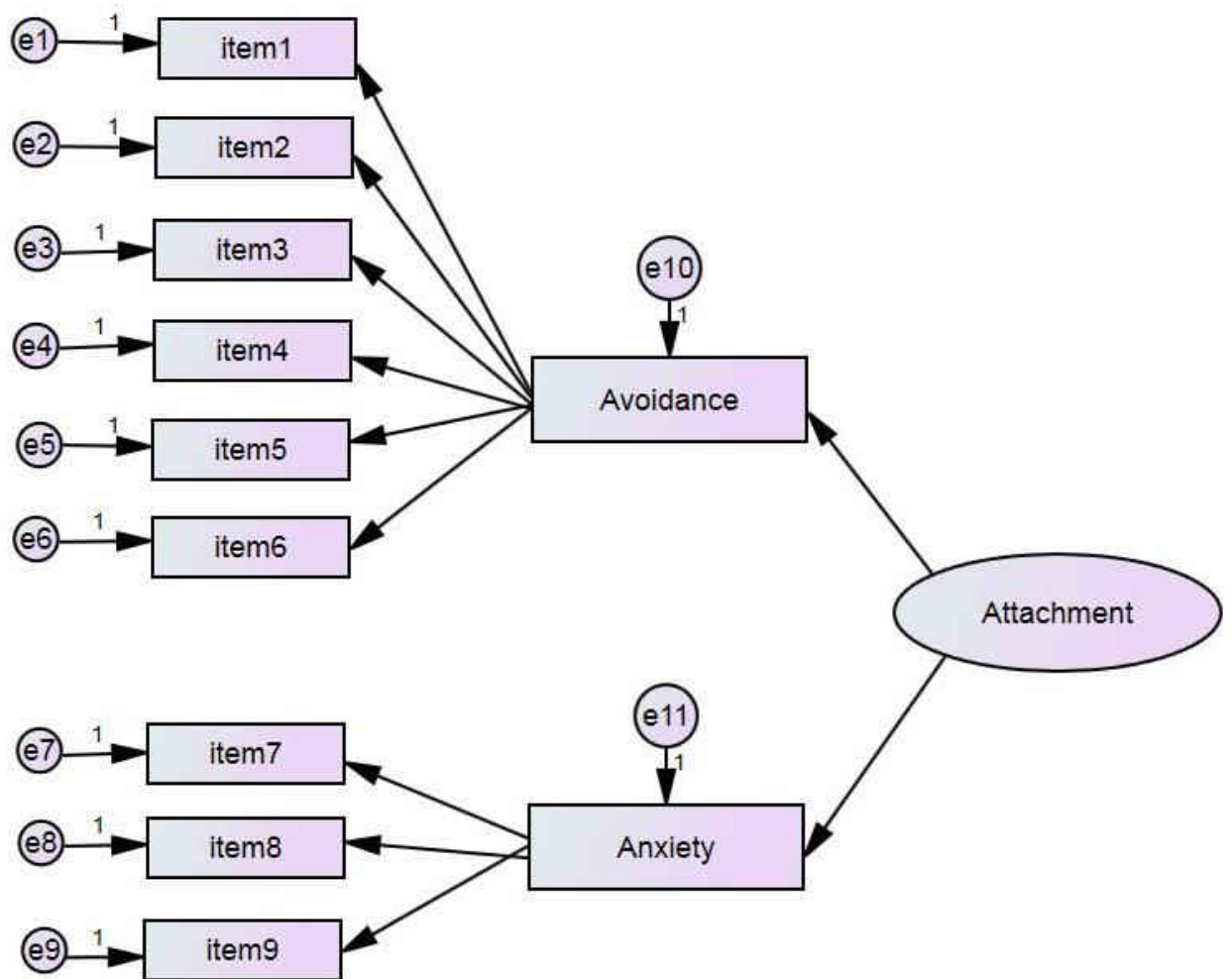


Figure 5: Measurement Model for the ECR-RS

Relationship Assessment Scale (RAS)

The *Relationship Assessment Scale* was developed by Hendrick (1988) to measure relationship satisfaction in a variety of close relationships. The RAS is a 7-item, one factor instrument with a 5-point Likert scale where “1” represents the lowest level of

satisfaction and “5” represents the highest level of satisfaction. In order to score the assessment, item totals are averaged.

Hendrick (1988) normed the RAS on a sample of 125 undergraduate psychology students who reported being “in love” and a sample of 57 dating couples. The results of Hendrick’s (1988) two studies indicated strong concurrent validity, and appropriate convergent and discriminant validity. Additionally, in Hendrick’s second study, participants were contacted at the end of a school semester ($n = 31$) to determine whether the couple was still dating. The RAS predicted 91% of the “together” and 57% of the “apart” participants, thus establishing predictive validity. The RAS has been used in over 150 studies (Graham, Diebels, & Barnow, 2011) and has established strong reliability and validity (Hendrick, Dicke, & Hendrick, 1998). Therefore, the researcher determined the RAS to be a valid and reliable instrument for use in this research investigation (see Figure 6).

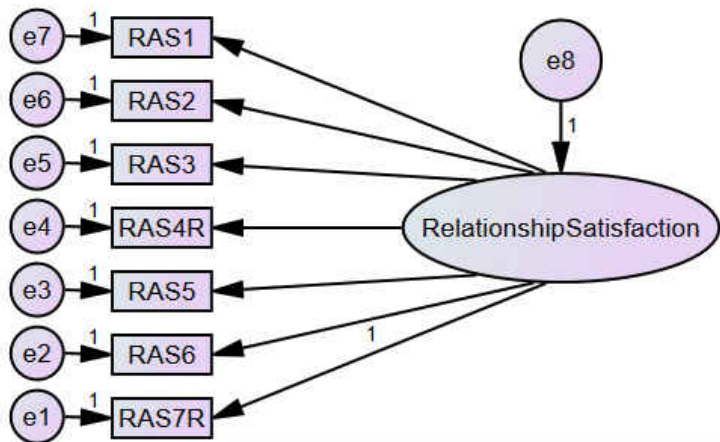


Figure 6: Measurement Model for the RAS

Marlowe-Crowne Social Desirability Scale – Form A (MCSDS-FA)

Crowne and Marlowe (1960) developed the Marlowe-Crowne Social Desirability Scale (MCSDS) to measure social desirability in participant response sets. The initial scale was normed on a sample of college students ($n = 76$) and resulted in a 33-item assessment with strong internal consistency ($\alpha = .0.88$) and test-retest reliability ($r = 0.89$). The MCSDS is a popular instrument and has been used in over 700 research investigations (Barger, 2002). However, due to the length of the MCSDS, multiple short forms of the assessment have also been published (Reynolds, 1982).

Some researchers have lauded the short forms of the assessment for being stronger assessments than the original (Fischer & Fick, 1993), whereas other researchers have criticized shortcomings of the short form versions of the MCSDS for first component factors accounting for low levels of variance in total scores (16%, Reynolds, 1982; 13%, Strahan & Gerbasi, 1972), and demonstrating low levels of internal consistency reliability (Barger, 2002). As such, researchers have repeatedly tested the assortment of short forms of MCSDS, and reported inconsistent findings as to which assessment is the superior short form of the MCSDS (Fischer & Fick, 1993; Loo & Thorpe, 2000).

Reynolds (1982) originally created Form A, B, and C short form versions of the MCSDS, and normed the three forms with a sample of 608 undergraduate students ($n = 369$ female, 60.7%, 81.2% white, $M = 20.54$ years old, $SD = 4.01$ years, with a range of 17 to 54 years old), 30.5% freshmen, 29.8% sophomores, 21.0% juniors, and 19.7% seniors). By comparison of relatedness to the original MCSDS (Crowne & Marlowe,

1960), brevity, and strong internal consistency across studies, the researcher determined Reynolds' (1982) Form A to be the strongest and most efficient version of the short form assessments.

Data Analysis

The researcher collected the data utilized in this research study from (a) face-to-face data collection, and (b) an electronic survey hosted on Qualtrics (www.qualtrics.com). Both data collection methods included the *General Demographics Questionnaire* and six assessment instruments including (a) the ODI, (b) AMES (Vossen et al., 2015), (c) the SOOS, (d) ECR-RS (Fraley et al., 2011), (e) the RAS (Hendrick, 1988), and (f) MCSDS-FA (Reynolds, 1982). The researcher downloaded the data to *Statistical Program Systems 20th edition* (SPSS, 2011) and analyzed with both SPSS (for data cleaning and Multiple Regression analysis) and the *Analysis of Moment Structure 21st edition* (AMOS, 2012; for Structural Equation Modeling [SEM] analysis). The researcher cleaned the data by analyzing missing data (Hair et al., 2010; Osborne, 2013) and addressing outliers (Crocket, 2012). The researcher tested data for normality, homogeneity, and multicollinearity, to ensure that data were appropriate for analysis.

Statistical Method to Examine Research Hypothesis

This study utilized SEM to analyze the research hypothesis. SEM has been described as a confirmatory procedure (Kline, 2011) that encompasses an array of additional statistical methods including multiple regression, path analysis, and

confirmatory factor analysis (Schumacker & Lomax, 2010) in order to examine the directional relationships of multiple variables (Tabachnick & Fidell, 2013). SEM is often used in correlational studies (Kline, 2011), and is increasingly being used in counseling research (Crocket, 2012; Quintana & Maxwell, 1999).

The theoretical model tested in this research study contained latent variables (e.g., online dating intensity, empathy, objectification of others, relationship quality) and manifest variables, which are the subscale factor scores of assessments directly measured by assessment items (Kline, 2011; Schumacker & Lomax, 2010). Unique to SEM is the representation of two kinds of models, (a) the measurement model, which indicates how manifest variables contribute to latent variables; and (b) the structural model, which identifies hypothesized relationships between constructs (Schumacker & Lomax, 2010). One strength specific to SEM is that measurement error is accounted for, and thus relationships identified in SEM models are free of measurement error (Schumacker & Lomax).

The hypothesized theoretical model (structural model) is presented in Figure 1. This structural model presents online dating services as a predictor for levels of empathy and objectification of others, and relationship quality with romantic partners. An 11-factor model of these constructs was hypothesized. Specifically, use of online dating services was identified as a latent variable with two anticipated manifest variables (i.e., *Intensity*, *Attitudes*) composed of 10 items. Empathy was a latent variable with three manifest variables (i.e., *Cognitive Empathy*, *Affective Empathy*, and *Sympathy*) with 12 direct measured items, four per construct. Objectification of others was another latent

variable composed of three anticipated manifest variable (i.e., *Internalized Sexual Objectification, Disempathy and Commenting About Women's Bodies*, and *Insulting Unattractive People*) consisting of 12 items. Lastly, quality of relationship with romantic partners was measured by two manifest variables of the ECR-RS (i.e., *Anxiety* and *Avoidance*, Fraley et al., 2011) consisting of nine items total and one manifest variable of the RAS (*Relationship Satisfaction*, Hendrick, 1988). The researcher hypothesized that emerging adults' greater intensity of use of online dating services would predict (a) *decreased* levels of empathy, (b) *increased* levels of objectification of others, and (c) *decreased* quality of relationships with romantic partners.

Statistical Method to Examine the Exploratory Research Questions

The researcher used multiple parametric and non-parametric statistical procedures to examine the exploratory research questions in this research investigation including (a) descriptive statistics, (b) Pearson Product-Moment Correlations, (c) Spearman Rank Order correlations (d) multiple regressions, (e) ANOVA, and (f) Independent-Samples T-Test. The researcher also utilized Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to conduct SEM. The researcher examined the descriptive statistics of the data in order to more thoroughly understand the demographic information of the sample (Hair et al., 2010). The researcher used Pearson Product-Moment and Spearman Rank Order correlations to explore independent correlations (i.e., relationships) between the constructs of interest (e.g., online dating, empathy, objectification of others, and quality of relationship with romantic partners) and

demographic factors (e.g., age, gender, ethnicity; Gall et al., 2010) to determine if relationships existed between the constructs and to provide theoretical evidence supporting or contesting the existence of extraneous variables. The researcher also used ANOVA to investigate mean differences between emerging adults' scores on the data collection instruments (ODI, AMES [Vossen et al., 2015], SOOS, ECR-RS [Fraley et al., 2011], RAS [Hendrick, 1988]) by their demographic information.

Ethical Considerations

Ethical considerations were reviewed by the by UCF's IRB and the researcher's dissertation committee prior to any recruitment of participants and data collection. These ethical considerations included but were not limited to:

1. The confidentiality and anonymity of participant data.
2. Voluntary participation in the study (e.g. participation or non-participation did *not* impact students academically).
3. Participants were be informed of their rights through informed consent (IRB approved) as research participants that included voluntary participation and the opportunity to withdraw from the study without consequence or retribution.
4. The researcher received permission to use the instruments in this study as well as to manipulate them or to transfer them to an online format (i.e., Qualtrics).

5. This study was conducted with the permission and approval of the dissertation chairs, committee members, participating universities and colleges, and the IRB at the University of Central Florida.

Potential Limitations of the Study

This investigation included several limitations. First, this investigation utilized a correlational design, thus causality could not be determined by the relationships identified in this study (Kline, 2011). Moreover, this investigation was vulnerable to several threats to internal, external, and testing validity (Gall et al., 2007). Additionally, convenient sampling procedures utilized in this investigation limit generalizability of research findings.

Limitations notwithstanding, the researcher attempted to mitigate against these identified limitations by conducting a thorough literature review on the constructs of interest in the investigation in order to utilize the most empirically sound assessment instruments for the constructs of interest, as well as to heed precautions and recommendations made by researchers. Moreover, the researcher chose to conduct SEM to better understand the directionality of the relationships between the constructs of this investigation, which is beyond the scope and power of most correlational methods. Furthermore, the researcher employed the MCSDS-FA (Reynolds, 1982) to account for social desirability in participants' responses. The researcher also collected participant demographic information and used it in analyses to examine unique relationships between covariates and to examine and account for unique relationships that influenced

the dependent variables. Furthermore, the researcher also accounted for attrition and assessed the data for patterns and severity of missing data.

Chapter One Summary

This chapter introduced the constructs of interest in this research investigation (i.e., online dating, empathy, objectification of others, and romantic relationship quality). Furthermore, the researcher introduced the rationale for the study, the significance of the study, and operational definitions of terms used throughout the investigation, as well as study limitations. The researcher also introduced the research design including information pertaining to population and sampling procedures, data collection methods, research method and data analysis, as well as the research hypothesis and exploratory research questions guiding the investigation. This study sought to examine the directional relationships between emerging adults' use of online dating on their levels of empathy, objectification of others, and quality of relationships with romantic partners, thus heeding the call of researchers to explore the relationships between these constructs of interest in an empirically sound manner.

CHAPTER TWO: REVIEW OF THE LITERATURE

Chapter two reviews four major areas of theory and research: (a) attachment theory, (b) empathy, (c) objectification of others, and (d) social communication technology. First, the chapter begins with a discussion of the population of interest: emerging adults. Next, the chapter introduces the main concepts of attachment theory (Ainsworth, 1989; Bowlby, 1969, 1973, 1980) and presents research findings in regard to emerging adult romantic relationships. The chapter then presents the primary theoretical tenants of interpersonal neurobiology (Badenoch, 2008; Siegel, 2010; 2012; 2013) and research findings related to empathy. Next, the chapter provides a brief overview of objectification theory (Fischer, Bettendorf, & Wang, 2011; Fredrickson & Roberts, 1997; Heimerdinger-Edwards, Vogel, & Hammer, 2011) as well as research related to the objectification of others. Fourth, the chapter provides a brief overview of research related to social communication technology and a thorough review of research regarding online dating. This chapter concludes with a discussion of the connection between all of these constructs of interest and support for this research investigation.

Emerging Adults

Historically, adolescence has been considered to be a crucial time in an individual's development and the final stage of development before adulthood (Erikson, 1968; Steinberg & Morris, 2001). It has been described as a period of "storm and stress," social and cultural transition (Blakemore & Mills, 2014), a period of vulnerability in establishing psychological health (Stenberg, 2005), and "[...] an essential time of

emotional intensity, social engagement, and creativity” (Siegel, 2013, p. 4). Traditionally, adolescence has been conceptualized as taking place in an individual’s teen years with adulthood following as the next stage in development (Berk, 2008; Siegel, 2013). However, due to changing circumstances in Western society, researchers have argued for the existence of an additional stage between the transition from adolescence to adulthood (Arnett, 2000; 2004; Arnett & Tanner, 2006). Researchers have described this stage of development as, “[...] the age of feeling ‘in between’ and the age of identity, possibilities, exploration, and instability, all highlighting the psychological dimension of becoming an adult” (Tanner, 2008, p. 888). Researchers have termed this unique stage in development as *emerging adulthood* (Arnett, 2000; 2004; 2015)

In generations past, adolescents transitioned to adulthood by moving from dependence on one’s family of origin to independence through their establishment of financial security, partnering romantically with another individual, and beginning their own families (Arnett, 2000; 2015; Arnett & Tanner, 2006). However, due to economic instability, increased need for secondary and post-secondary education, and changing cultural norms, young adults are staying at home and depending on their family of origin for longer periods of time than in previous decades (Arnett, 2000; 2015; Arnett & Tanner, 2006). Thus, some researchers have differentiated stages of development and identified individuals between the ages 10 to 18 years old as adolescents and individuals between the ages of 18 to 29 years old as emerging adults (Jensen & Arnett, 2012). In her review of the literature, Tao (2013) described individuals in emerging adulthood as “[...] figuring out who they are and want to be, identifying their stances on politics and

religion, and understanding their roles across various contexts (e.g., school, home, community)” (p. 125), thus highlighting this period of time as a unique developmental stage.

Beyond social circumstance, emerging adults are also unique due to a series of significant changes in their brain (e.g., neuroplasticity) that continue to develop throughout an individual’s life (Siegel, 2013). Through the process of neurogenesis, emerging adults’ experiences result in the creation of new neurons. Simultaneously, practiced behaviors result in synaptogenesis – the connection between neurons, allowing for more neurons to fire collectively during an experience. Emerging adult brains also lay down myelin sheathing – a tissue that overlaps synapses to accelerate the sending and receiving of electric signals in the brain – which results in brain processes occurring at faster rates. Lastly, through the process of pruning, neurons that are no longer used in the brain atrophy and are reduced. Combined, all of these processes enable emerging adults’ brains to be highly efficient in activities they practice – in breadth, depth, and speed. Therefore, that which “fires together, wires together,” (Siegel, 2012; p. 9-1), resulting in a brain geared toward continuing practiced behaviors compared to unpracticed behaviors (Siegel, 2010; 2012). For example, if an individual who appraises the value of art for a living attends an art show, the individual would begin to speculate on the value of the art on display, and it might be difficult for that individual to view the art in an appreciative manner outside the realm of appraisal.

With the understanding that emerging adulthood is a unique period of time in an individual’s development, the current generation of emerging adults is made even more

unique because it is “the first cohort to have ‘grown up’ with social networking,” (Best, Manktelow, & Taylor, 2014, p. 28). Using an interpersonal neurobiology lens (see Siegel, 2012), it is plausible that emerging adults are training their brains – through their use of social communication technology – to become efficient in digital (i.e., online) relationships, perhaps with greater proficiency than face-to-face relationships, and thus potentially negatively affecting their ability to develop and establish healthy romantic relationships (Cyr, Berman, & Smith, 2015). In their review of the literature, Best and colleagues (2014) identified technological advances as a potential cause for the unique challenges and demands current emerging adults face – unlike any previous generations. While research has explored the relationship between social communication technologies and various constructs (e.g., depression, loneliness, anxiety), research regarding online dating specifically is still developing. Therefore, this study investigated the relationships between emerging adults’ online dating behaviors and the quality of their relationships as well as the influence of mediating relational constructs such as empathy and objectification of others.

Emerging Adult Relationships

Emerging adulthood involves developing meaningful relationships (Chickering & Reisser, 1993). Individuals who have support systems are less severely impacted by negative life events than individuals who lack meaningful relationships (Cohen & Ashby Willis, 1985). Furthermore, researchers identified that the presence or absence of healthy interpersonal relationships affect the formation or healing of psychological disorders

(Cozolino, 2006) and are associated with individuals' well-being (Argyle, 1987; Best et al., 2014; Nezlek, 2000). Beginning in adolescence, peer relationships become increasingly important (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996; Manago, Taylor, & Greenfield, 2012), and romantic relationships develop with greater levels of seriousness in permanency and consistency (Fincham & Cui, 2000) through emerging adulthood (Arnett, 2000; 2015). While researchers continue to explore definitions of healthy interpersonal relationships (Siegel, 2010) as well as their antecedents, many researchers subscribe to the major tenets of attachment theory to examine relationship phenomena.

Attachment Theory

Attachment theory originated in John Bowlby's theoretical work and developed throughout the 1960's and into the 1990's through his partnership with Mary Ainsworth (Ainsworth & Bowlby, 1991). The researchers worked both independently and collaboratively to establish a theory to explain the nature of children's attachment to parents, and parent-like surrogates, in infancy and throughout the life span (Ainsworth, 1989; Bartholomew & Horowitz, 1991). Attachment theory has been examined with a variety of populations from infancy through adulthood (Zilberstein, 2014), and has been utilized in its entirety as a therapeutic model for client treatment and adopted into integrative therapies (Gold, 2011).

Similar to Freud's psychoanalytic theory, Bowlby (1982) emphasized the importance of early parent-child interactions. With an evolutionary lens, Bowlby

suggested that an infant's survival was dependent upon his or her relationship with strong and capable parental figures - termed *attachment* figures – to care for and to protect the infant. Therefore, a fundamental component of attachment theory is that individuals seek supportive *others* in times of need in order to acquire care, support, and protection, resulting in feelings of safety and security (Ainsworth, 1989). Consequentially, Ainsworth and Bowlby (1991) theorized that the availability and responsiveness of a caregiver had profound effects on an infant's view of self and the world.

When an individual perceives a threat – real or symbolic – and successfully seeks out the support of a caregiver and is comforted, the relationship is considered *secure*, and the individual has a *secure attachment style* or *attachment pattern* (Ainsworth, Blehar, Waters, & Wall, 1978; Grossman & Grossman, 1991; Hazan & Shaver, 1987; Main, Kaplan, & Cassidy, 1985; Simpson, 1990). Individuals with secure attachment styles tend to have received attentive and consistent caregiving from attachment figures, allowing the individual to form healthy internal working models promoting self-worth and a view of the world as safe. However, different parenting styles result in less healthy attachment styles. For example, children with attachment figures who were inconsistent in their attention and support of the child tend to have *anxious-ambivalent* attachment styles, promoting an inconsistent view of the self and self-worth, and inconsistent feelings of the world and others as safe and trustworthy. Similarly, children with attachment figures who were unresponsive to the child's needs tend to have *avoidant* attachment styles, consequently promoting feelings of being unwanted or not having worth, and a view of the world as unsafe and possibly rejecting (Ainsworth et al., 1978).

Researchers have determined two primary dimensions that predict attachment styles (see Ainsworth et al., 1978, Brennan et al., 1998; Mikulincer & Shaver, 2007): (a) attachment anxiety and (b) attachment avoidance. Attachment anxiety is characterized as an individual's worry that an attachment figure will be *unavailable* when the individual seeks comfort and security (e.g., in times of need or danger). Researchers theorize that increased attachment anxiety results in an individual's increased effort to maintain close relationships to attachment figures. Attachment avoidance, in contrast, is defined as an individual's *distrust* that an attachment figure or partner would be supportive or helpful during a time of need. Accordingly, researchers theorize that individuals with high levels of attachment avoidance increase his or her need to establish independence and self-reliance (Mikulincer & Shaver, 2012).

Influenced by attachment anxiety and attachment avoidance, attachment patterns are formed in the stability and security of emotional bonds in significant relationships in infancy and continue throughout an individual's life in the form of interdependence and reliance on others (Ainsworth, 1989). Bowlby (1973) suggested that the early experiences between an infant and attachment figure form the basis of an individual's understanding of how relationships operate. Hence, just as infants pursue attachment figures for support and security, early attachment behaviors are used in intimate relationships later in life (Collins, 2003), with similar patterns in emotional bonds between romantic partners and caregivers (Bowlby, 1988). Thus, in romantic relationships, just as in early life, individuals work to maintain a comfortable approximation or distance from one's

romantic partner, similar to patterns of closeness or distance first established in infancy (Bowlby, 1982; Hazen & Shaver, 1987).

Romantic Attachment

Adults attach to other individuals on an emotional level during the formation and maintenance of close relationships such as friendships, romantic partners, business associates, etc. (Fraley & Shaver, 2000). Attachment issues also play a central role in romantic relationships (Ainsworth, 1989; Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010). Researchers indicated that attachment style is related to an individual's emotional experience (e.g., experiencing positive or negative emotions) in the relationship and the consequential quality of the relationship (i.e., relationship satisfaction; Agishtein & Brumbaugh, 2013; Pallini, Baiocco, Schneider, Madigan, & Atkinson, 2014). Whereas individuals with secure attachment tend to feel more satisfied in their relationship and tend to have more positive relationships qualities (Shaver & Hazan, 1993), individuals with insecure attachment relationships tend to experience lower levels of satisfaction and stability in their romantic relationship, as well as lower levels of trust and intimacy (Kirkpatrick & Davis, 1994).

According to attachment theory, insecurely attached individuals fear the loss of the relationship or the unpredictable response of the attachment figure (i.e., romantic partner), thus, threatening the individual's sense of security in the relationship, partner, or view of self (Ainsworth, 1989). Moreover, individuals with insecure attachment styles experience greater levels of jealousy and are more likely to perceive threats to their

romantic relationships (Buunk, 1997; White & Mullen, 1989). By contrast, anxiously attached individuals – high in anxiety, low in avoidance – fear rejection but crave emotional closeness, and fear that their partner will leave them to find another partner (Mikulincer et al., 2010). Thus, anxiously attached individuals tend to worry about the potential loss of their partner and/or relationship, hold negative-self views, and then try to alleviate anxiety by initiating closeness, attention, and security in their relationship through controlling behaviors or emotional manipulation (Mikulincer & Shaver, 2007). Finally, adults with avoidant attachment styles – low in anxiety, high in avoidance have expectations that caregivers cannot be trusted. They tend to use strategies to implement or maintain emotional distance through emotional and behavioral strategies that deny the need for intimacy and closeness (Mikulincer & Shaver).

Besides identifying associations between attachment styles and quality of relationships, researchers identified ways in which attachment style is associated with inaccurate assessment of the relationship. For example, Overall, Fletcher, Simpson, and Fillo (2015) investigated the accuracy with which individuals could perceive their partners' emotions and found that the couples with avoidant attachment styles overestimated the intensity of their partners' negative emotions and individuals with an anxious attachment style reacted to their partners' negative emotions with hostility or defensive behavior.

In summary, attachment theory extends beyond infant-caregiver relationships and is applicable to understanding the behaviors and patterns between partners in romantic relationships. Specifically, attachment theory provides a foundation for understanding the

interplay of essential perceptive and behavioral dynamics between partners that promotes or hinders relationship success. Therefore, in this current investigation, the researcher measured the quality of romantic relationships through the use of the RAS (Hendrick, 1988) and attachment theory as measured by the ECR-RS (Fraley et al., 2011). The following section reviews the empirical research related to romantic attachment.

Research on Romantic Attachment

Dinero, Conger, Shaver, Widaman, and Larsen-Rife (2011) summarized the literature on insecure attachment and found that individuals with anxious attachment patterns expressed lower levels of enjoyment with romantic partners, experienced greater levels of distress, and used maladaptive communication skills when in disagreement with romantic partners. Further, the researchers reported that individuals with avoidant attachment styles are identified in the literature as being less attentive to their romantic partners and making less nonverbal connections to their partner (e.g., eye contact, smiling, physical contact). In contrast, individuals with secure attachment styles tend to have positive early family experiences, trusting attitudes towards others, high self-confidence, longer relationships, and more fulfillment (e.g., lower ratings of “unfilled hope”) compared to individuals with insecure attachment (Feeney & Noller, 1990).

Pistole (1989) examined relationship satisfaction and attachment styles in a sample of 137 undergraduate students. Participants completed Hazan and Shaver’s (1987) *Adult Attachment Measure* (AAM) and the *Dyadic Adjustment Scale* (DAS; Spanier, 1976). Pistole identified statistically significant differences between groups with different

attachment styles in relation to relationship satisfaction ($F = 13.88, df = 2, 131, p < .05$) and relationship cohesion ($F = 3.12, df = 2, 131, p < .05$). Specifically, individuals with secure attachment styles ($M = 38.81$) reported experiencing higher levels of relationship satisfaction than individuals with avoidant attachment styles ($M = 34.28$; Newman-Keul = 3.89. $p < .05$) and anxious-ambivalent attachment styles ($M = 33.00$; Newman-Keul = 4.55. $p < .05$). Pistole's investigation is important to the present study because she found that an individuals' attachment style was associated with relationship satisfaction with a sample of college students (i.e., emerging adults). However, Pistole's investigation contained several limitations including the use of Hazen and Shaver's AAM, which has weak psychometric properties and vulnerabilities that may limit the strength of research conclusions (see Simpson, 1990).

In a similar study, Simpson (1990) surveyed 144 undergraduate heterosexual couples ($N = 288, M = 19.1$ years old; $M = 13.5$ month long relationships) using a battery of established assessments with stronger psychometric properties (see Simpson, 1990). The survey measured attachment style (e.g., secure, anxious, avoidant), relationship interdependence (e.g., greater love for, dependency, and self-disclosure), commitment (e.g., commitment to and investment in the relationship), trust (e.g., greater predictability of, dependability of, and faith in the partner [lower levels of insecurity]), and relationship satisfaction. Following the initial investigation, Simpson contacted participants ($n = 264, 91.67\%$ response rate) about six months later to investigate participants' relationship status and relationship distress. Simpson identified that males and females who had secure attachment styles were in relationships with greater interdependence ($r = .26, p <$

.01; $r = .27$; $p < .01$), greater commitment ($r = .15$, $p < .10$; $r = .27$; $p < .01$), greater trust ($r = .38$, $p < .001$; $r = .37$; $p < .001$), and greater satisfaction ($r = .23$, $p < .01$; $r = .29$; $p < .001$). Further, males and females with avoidant attachment styles were in relationships with less interdependence ($r = -.25$, $p < .01$; $r = -.29$; $p < .001$), commitment ($r = -.19$, $p < .05$; $r = -.30$; $p < .001$), trust ($r = -.31$, $p < .001$; $r = -.34$; $p < .001$), and satisfaction ($r = -.20$, $p < .05$; $r = -.27$; $p < .01$). Simpson identified differences between males and females in relation to anxious attachment styles where males with anxious attachment styles were in relationships with less trust ($r = -.40$, $p < .001$) and less satisfaction ($r = -.23$, $p < .01$), while women with anxious attachment styles were in relationships defined by less commitment ($r = -.23$, $p < .01$) and less trust ($r = -.45$, $p < .001$). Males and females with secure attachment styles experienced less mild ($r = -.33$, $p < .001$; $r = -.22$; $p < .001$) and intense ($r = -.19$, $p < .05$; $r = -.15$; $p < .10$) negative emotions and more mild ($r = .31$, $p < .001$; $r = .44$; $p < .001$) and intense ($r = .31$, $p < .001$; $r = .46$; $p < .001$) positive emotions. Whereas males and females with higher avoidant attachment styles experienced more mild ($r = .28$, $p < .001$; $r = .28$; $p < .001$) and intense ($r = .20$, $p < .01$; $r = .23$; $p < .01$) negative emotion, less mild ($r = -.22$, $p < .001$; $r = -.41$; $p < .001$) and intense ($r = -.32$, $p < .001$; $r = -.32$; $p < .001$) positive emotions. Simpson identified similar findings for males and females with anxious attachment styles, as they also experienced more mild ($r = .37$, $p < .001$; $r = .39$; $p < .001$) and intense ($r = .30$, $p < .001$; $r = .26$; $p < .01$) negative emotions, less mild ($r = -.31$, $p < .001$; $r = -.44$; $p < .001$) and intense ($r = -.21$, $p < .05$; $r = -.21$; $p < .05$) positive emotions. Lastly, Simpson identified that men who were higher in avoidant attachment styles experienced statistically

significantly less emotional distress following the breakup of a relationship ($r(46) = -.33$, $p < .02$), which supports the theoretical notion that individuals with avoidant attachment styles engage in romantic relationships with limited depth and emotional closeness. The conclusions of this study identify and support findings consistent in the literature related to the positive qualities of individuals with secure attachment and their romantic relationships, and the negative relationship qualities and experiences of individuals with avoidant and anxious attachment patterns, specifically in regard to experiences of trust, commitment, satisfaction, and emotions. However, the sample in this study was composed of couples in recently formed relationships, thus making it difficult to generalize the results of this study to all couples. Further, the author noted several limitations associated with using the *Adult Attachment Measure* (Hazan & Shaver, 1987), as it reports participants as exclusively one attachment style and the authors modified it for use in their study.

Individuals' attachment styles are related to several marks of romantic relationship quality (e.g., trust, commitment, satisfaction, emotional experience), moreover it is necessary to note that attachment is dynamic and can differ by relationship or by context (Caron, Lafontaine, Bureau, Levesque, & Johnson, 2012; Fraley et al., 2011). Waters, Merick, Treboux, Crowell, and Albersheim (2000) were some of the first researchers to examine the stability of attachment over a longitudinal period. Waters and colleagues detailed the history of attachment research beginning with the Ainsworth and Wittig Strange Situation in 1975 and 1976 (see Ainsworth et al., 1978). The authors reported that 60 one-year-old babies participated in that experiment, and 50 participated

in a follow up study six months later (see Waters, 1978). Nearly 20 years later, 50 participants (21 male and 29 female) participated in George, Kaplan, and Main's (1985) Berkely *Adult Attachment Interview* (AAI). Using data from these studies, Waters and colleagues (2000) examined the relationships between attachment styles: (a) secure, (b) dismissing (i.e., avoidant) and (c) preoccupied (i.e., anxious) over time. The authors reported that 32 of 50 participants (64%) demonstrated consistent attachment styles between infancy and emerging adulthood ($k = .40, p < .005, \tau = .17, p < .003$ [AAI dependent]). Using the secure-insecure dichotomy, 36 of 50 participants (72%) received the same classification, $k = .44, p < .001, \tau = .20, p < .003$.

The researchers also investigated the effect of negative life events, defined as (a) loss of a parent, (b) parental divorce, (c) life-threatening illness of a parent or child, (d) parental psychiatric disorder, or (e) physical or sexual abuse by a family member. With attachment classification in consideration, R^2 change regarding presence or absence of stressful life events was .14, $F(3, 46) = 8.48, p < .006$, indicating that 66% of infants with secure attachment changed attachment styles (compared to 15% with no stressful events reported, $p < .01$). Further, 22% of insecure infants with one or more stressful life events developed secure attachment as emerging adults (compared to 33.3% if no stressful events reported); however, this finding was *not* statistically significant ($p < .59$).

It is necessary to note limitations associated with this study including compounded measurement error at each measurement opportunity, the possibility that observational measurements taken in infancy did not reflect actual attachment styles outside of a laboratory setting, and the authors failed to account for the unique nature of

the middle class sample or the rigid constraints around what researchers qualified as a “stressful life event.” Nonetheless, the authors theorized that attachment stability was possibly related to (a) consistency in caregiver behavior across time, (b) persistence in early cognitive structures, (c) moderate intensity and low frequency of attachment-related stressful events, (d) the effects of individuals on their environment, and (e) stabilizing effects of personality trait variables. Waters and colleagues’ (2000) results indicated that attachment styles are relatively stable, but also open to change depending on life experience. The findings from Waters and colleagues’ (2000) work supports tenets of interpersonal neurobiology in that one’s brain and various facets of functioning (e.g., attachment) can change based on lived experience. As it relates to this investigation, the researcher examined the influence of online dating on attachment styles.

In summary, attachment theory is a viable marker for romantic relationship quality (Pistole, 1989) through inferences that can be made about commitment, trust, relationship satisfaction, and emotional experiences in a relationship (Simpson, 1990). As it relates to the current investigation, Waters and colleagues’ (2000) investigation provided evidence that attachment styles, despite being relatively stable, are vulnerable to change dependent upon one’s life experience. Because attachment styles are vulnerable to change, and researchers argue that practiced behaviors can physically change the brain and one’s emotional experience (Siegel, 2010; 2012), researchers are compelled to answer the question of how online dating might influence the quality of emerging adults’ romantic relationships using attachment style as a measure of relationship quality.

Empathy

Human beings are mammals, possessing a limbic system (amygdala, anterior cingulate, hippocampus, and hypothalamus) that is responsible for memory, emotion, and attachment (Siegel, 2010; 2012). According to Bowlby (1969; 1973; 1980), relationships play an essential role in the development of children and continue to be an important part of an individual's health and well-being throughout one's lifetime, and empathy is the essential ingredient to relationships (Szalavitz & Perry, 2010).

Definitions of empathy vary across studies (Elliott, Bohart, Watson & Greenberg, 2011) and an operationalized definition remains "elusive" (Spreng, McKinnon, Mar, & Levine, 2009, p. 62). Reviewing the history of empathy including the origin of the word *empathy*, Wispé (1987) referred to Titchener's (1909) translation of the German word *Einfühlung*, which translates to "feeling into." Similarly, in the context of counseling, Rogers (1980) described empathy as "[...] willingness to understand a client's thoughts, feelings, and struggles [...]" (p. 85).

Empathy is accepted as including both cognitive and affective components (Davis, 1983; Duan & Hill, 1996; Vossen et al., 2015), each hosted by different brain circuits (Singer, 2006). The cognitive component "[...] involves an intellectual or imaginative apprehension of another's emotional state [...]" (Spreng et al., 2009, p. 62) and encompasses *perspective taking* (PT) of another person's experience. Moreover, PT is the ability to imagine the thoughts and viewpoint or outlook of another individual. The affective component of empathy "[...] is commonly thought of as an emotional reaction (e.g., compassion) to another's emotional response (e.g., sadness)" (Spreng et al., 2009,

p. 62) and has been referred to as *empathic concern* (EC) regarding an individual's interest or investment in another individual's situation (Davis, 1980; 1983). EC relates to the *feeling* component identified by Rogers (1980) and Wispé (1987).

Researchers confound the definition of EC with sympathy (Miklikowska, Duriez, & Soenens, 2011) and other researchers criticized the failure to distinguish between these two constructs (Vossen et al., 2015). Comparing empathy and sympathy, Szalavitz and Perry (2010) described, "With empathy, [...] you feel the other person's pain. You're feeling sorry 'with' them, not just 'for' them" (p. 13). Whereas with sympathy, "[...] while you understand what others are going through, you don't necessarily feel it yourself" (Szalavitz & Perry, p. 13). Perhaps to bypass the problem of defining empathy and to further distinguish it from sympathy, researchers have begun to explore the basis for empathy in the neuroscience of the brain (see Decety & Ickes, 2009).

Every person has a mirror-neuron system consisting of neurons throughout the entire body proper (Siegel, 2012). When an individual has an experience that results in the triggering of a neuron, the same neuron fires in the individual viewing the stimulus (Badenoch, 2008; Siegel, 2010; 2012). The result of the activation of mirror-neuron networks between individuals is the creation of an internal "you-map" of another person (Siegel, 2010, p. 8). For example, if an individual observes another person getting struck by an object, the viewer will cringe or flinch in response, because neurons that activate in the person being struck will also activate in the brain of the person witnessing the contact (Siegel, 2010). As an example of the power of this system, the adage that partners in a long-term relationships begin to look like one another is true (Siegel, 2010): partners in

life-long relationships exchange and mirror the same micro-expressions to one another over a lifetime resulting in hypertrophy of facial muscles used to express nonverbal communication. It is the work of the mirror-network system that allows individuals to experience and demonstrate PT and EC.

Rogers (1957) intuitively understood the necessity of empathy in a counseling relationship, which is now being verified by an understanding of the physiology of the brain (Badenoch, 2008; Decety & Ickes, 2009; Siegel, 2010) and validated in the counseling literature (see Elliott et al., 2011). Essentially, when two people make contact with one another, through non-verbal cues (e.g., tone, gesture, posture), a shared experience is created (Siegel, 2010). An effective relationship, then, is heavily based on the non-verbal communicative exchanges that form empathic connection (Badenoch, 2008; Siegel, 2010).

Research on Empathy

King, Mara and DeCicco (2012) summarized the literature on emotional intelligence (e.g., Goleman, 1995; Mayer, Caruso, & Salovey, 2000; Mayer & Salovey, 1993; Salovey & Mayer, 1990) and defined the construct as the ability to accurately perceive and manage emotions, to make meaning of emotions, and to use emotions to facilitate thinking. King and colleagues noted the central role of empathy in emotional intelligence, and research has since identified the role of emotional intelligence and empathy in individuals' well-being (Mavroveli, Petrides, Rieffe, & Bakker, 2007) as well as the dangerousness associated with empathy deficits in adult individuals (Hare, 1991).

Researchers examined the relationships that exist between higher levels of empathy and deficits of empathy on a wide array of constructs, identifying a spectrum of related prosocial and antisocial behavior. In their review of the literature, Eisenberg, Eggum, and Giunta (2010) summarized empathy-related responding as “[...] believed to influence whether or not, as well as whom, individuals help or hurt” (p. 144). In their review, the authors identified connections between empathy and prosocial behavior – an individual’s actions performed for another individual’s benefit – consisting of helping, sharing, and comforting, amongst other behaviors. Similarly, consistent with the literature, researchers identified individuals with greater empathy as more likely to volunteer (Davis et al., 1999), to donate to charity (Wilhem & Bekkers, 2010), and to possess greater levels of conflict resolution skills (de Wied, Branje, & Meeus, 2007; Paleari, Regalia, & Fincham, 2005). Researchers also found that individuals with greater empathy are more likely to feel grateful (McCullough, Emmons, & Tsang, 2002) and to be more forgiving in close relationships and in romantic relationships than individuals with lower levels of empathy (McCullough, Worthington, & Rachal, 1997; Paleari et al., 2005). A review of the literature illustrates the positive influence on the lives and well-being of individuals who have higher levels of empathy.

Eisenberg and colleagues (2010) reported that empathy and/or sympathy were negatively associated with antisocial behavior across populations (e.g., children, adolescents, young adults, adults), suggesting that empathy or sympathy might inhibit aggression. Indeed, researchers have associated deficits in empathy with behaviors related to aggression (Jolliffe & Farrington, 2004; Richardson, Hammock, Smith, &

Gardner, 1994), sexual aggression (Wheeler, George, & Dahl, 2002), and bullying (Gini, Albiero, Benelli, & Altoé, 2007). Ali, Amorim, and Chamorro-Premuzic (2009) investigated the relationships between psychopathy and Machiavellianism with emotional intelligence and empathy with a non-clinical sample of 84 undergraduates (67 females, 17 males, 18-46 years [$M = 20.7$, $SD = 4.1$], 63% Caucasian, 13% Black). Participants completed the *Levenson Self-Report Psychopathy Scale* (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995), the *Mach-IV* (Christie & Geis, 1970), the *Spielberger State-Trait Anxiety* (STAI, Spielberger, Gorsuch, & Luschene, 1970), the *Trait Emotional Intelligence Questionnaire – Short Form* (TEIQue-SF, Petrides & Furnham, 2006), and the empathy image task using the *Self-Assessment Manikin* (SAM, Bradley & Lang, 1994). After completing each of the initial assessments, participants then rated their affect in response to each of 36 images shown in a controlled university laboratory setting (SAM, see Bradley & Lang).

Ali and colleagues (2009) identified moderate and modest negative relationships between trait emotional intelligence secondary psychopathy ($r = -.48$, $p < .01$) and Machiavellianism ($r = -.23$, $p < .05$), but failed to identify statistically significant relationships with primary psychopathy ($r = -.17$, $p > .05$). The statistically non-significant relationship between Machiavellianism and psychopathy was deemed appropriate, as psychopathy and Machiavellianism are overlapping constructs, yet distinct from one another (Paulhus & Williams, 2002). The researchers reported that the findings of this study were consistent with previous research identifying that psychopathic individuals experience dysfunction in their ability to perceive sadness and

to connect to others empathically (Blair, 1995), yet contest the findings of Malterer, Glass, and Newman (2008) who identified a small but negative association between primary psychopathy and emotional intelligence. Ali and colleagues' (2009) study had several limitations including the use of a small sample consisting of mostly females and only using two basic emotions (e.g., happy, sad) for the empathy image task rather than a wide array of emotions. Nonetheless, this study was the first to examine facial emotion processing in Machiavellianism in addition to psychopathy, and identified the relationship between deficits in empathy and the possession of negative and potentially dangerous character traits.

Noting the importance of empathy in the quality of lives of individuals and their relationships, Allemand, Steiger, and Fend (2015) performed the first longitudinal study on empathy and examined the associations between adolescent empathy development (measured annually at ages 12 [$N = 2,054$], 13 [$N = 2,047$], 14 [$N = 2,003$], 15 [$N = 1,952$], and 16 years old [$N = 1,790$]) and adult social variables (measured at participants' age 35 [$N = 1,527$, 48.3% female]) in a sample of German individuals. Allemand and colleagues' 23-year study focused on the final collected sample of participants ($N = 1,527$, 48.3% female). Of the final sample, the researchers reported that 22.1% had completed a college or university degree, while 22.5% had completed a technical or professional training, 50.1% had completed an apprenticeship, and about 4.5% had no post-secondary education. Related to romantic relationships, 85.2% of the sample reported being in a romantic relationship. Using items pulled from existing self-report instruments, the researchers investigated a variety of research questions involving several

constructs (e.g., empathy, social integration, communication skills, relationship satisfaction, conflicts in relationships) through testing longitudinal measurement invariance, testing second-order latent growth models, and examining predictive associations between empathy and the adulthood social outcome variables.

Allemand and colleagues (2015) identified that empathy increased in participants from ages 12 to 16 ($r = .63, p < .01$ [age 12 to 13], $r = .78, p < .01$ [age 13 to 14], $r = .70, p < .01$ [age 14 to 15], $r = .71, p < .01$ [age 15 to 16]). Additionally, the authors examined linear growth models and ultimately identified variance in the amount of empathy individuals' possessed at the time of the first empathy measurement (intercept [$M = 0.28, p < .01, SE = 0.03$] and slope [$M = 0.09, p < .01, SE = 0.01$] did *not* statistically significantly covary [Cov = $-0.01, SE = 0.01$]), and changes in empathy were *not* consistent across individuals in the sample (statistically significant variances in intercept [Var = $0.20, p < .01, SE = 0.03$] and slope [Var = $0.01, p < .01, SE = 0.003$]). When examining differences in gender in relation to empathy, the researchers reported that females had higher initial levels of empathy compared to males (intercept [B = $-0.23, p < .01, SE = 0.04$]), but that it otherwise developed similarly to males' empathy during adolescence (slope [B = $-0.02, p > .10, SE = 0.01$]). Overall, females ($M = 4.49, SD = 0.69$) exhibited more empathy than males ($M = 4.17, SD = 0.73, d = 0.45$). Lastly, Allemand and colleagues (2015) identified that adolescent empathy development predicted social variables (i.e., greater communication skills, feelings of being socially integrated) in adulthood when controlling for gender (X^2 s = 1149.19 to 1475.55, $dfs = 874$ to 1006, $ps < .01$; CFIs = .983 to .989, RMSEAs = .014 to .017). The researchers

concluded that not only did levels of empathy matter but changes in adolescent empathy also predicted differences in individuals' level of social competence in adulthood over 20 years later. The findings reported in this study indicate that, perhaps more important than levels of empathy, are changes in empathy throughout adolescence – and thus emerging adulthood. The researchers reported “[...] increases in empathy might lead to better integration and interpersonal security in a variety of relationship experiences” (p. 238). The authors further cautioned, “It is possible that a decrease in empathy thus leads to negative relationship experiences, which might be related to negative outcomes later in life” (p. 238). However, the findings of this study are vulnerable to several limitations including the use of flawed assessment procedures (e.g., instrumentation), only having one data measurement in adulthood, and being vulnerable to additional extraneous variables.

Regarding the development of or decreases in empathy, Konrath, O'Brien, and Hasing (2011) performed a meta-analysis to examine changes over time in American emerging adult college students' dispositional empathy. Konrath and colleagues used a cross-temporal meta-analytic methods, such as the time-lag method, “[...] which separates the effects of birth cohort from age by analyzing samples of people of the same age at different points in time” (p. 180). The researchers performed a vigorous search on the Web of Knowledge citation index for articles that cited the IRI (Davis, 1980, 1983) and included in their investigation all identified studies published between the years of 1979 and 2009 that (a) utilized at least one subscale of the IRI on a 5-point Likert scale (Davis, 1980) and (b) included participants who were undergraduates at 4-year

institutions in the United States. The researchers also included two unpublished honors theses, three unpublished sets of data from Mark Davis, two unpublished dissertations, and two unpublished sets of data from the authors' own research, resulting in a final sample of 72 studies and a total sample size of 13,737 American college students (63.1% female; 69.0% Caucasian; mean age of 20.27).

When weighted by sample size, Konrath and colleagues (2011) concluded that American college students scored lower on EC and PT over the 30-year period of time with a statistically significant negative correlation between the year of data collection and EC ($\beta = -.38, p = .002, k = 66$) and PT ($\beta = -.27, p = .03, k = 64$). The researchers observed a moderate effect size in the reduction of EC scores over time ($d = 0.65$; Cohen, 1977) and a small to medium effect size for the decrease in PT scores over time ($d = 0.44$; Cohen, 1977). By conversion to percentile ranks, Konrath and colleagues reported “[...] between two thirds and three quarters of recent college students are below the 1979 PT and EC means, respectively” (p. 186).

When attempting to establish relationships between empathy and ethnicity, despite being limited by only 36 of 72 studies reporting ethnicity, Konrath and colleagues identified that samples with higher percentages of Caucasian participants possessed lower levels of EC ($\beta = -.44, p = .009, k = 34$) and PT ($\beta = -.36, p = .04, k = 33$). Limited by studies that reported male and female participants ($n = 69$), Konrath and colleagues also considered relationships between gender and empathy and failed to find statistically significant differences between gender on EC ($\beta = -.17, p = .19, k = 64$) or PT ($\beta = -.14, p = .28, k = 62$). Despite these findings, Konrath and colleagues' results are vulnerable to

limitations associated with the use of self-report data (e.g., instrumentation, social desirability), inclusion of non-peer reviewed and unpublished and research, and – for some studies included in their analysis – having to estimate when data was collected.

Making sense of their findings, the researchers (Konrath et al., 2011) discussed other trends in the literature spanning the 30 years between 1979 and 2009 which included increasing narcissism, violence, and bullying behaviors, and decreasing pro-social behaviors like charity and volunteerism. Reviewing the literature for trends that might explain the decrease in empathy, Konrath and colleagues suggested, “[...] one likely contributor to declining empathy is the rising prominence of personal technology and media use in everyday life. [...] With so much time spent interacting with others *online* rather than in reality, interpersonal dynamics such as empathy might certainly be altered” (p. 188).

In summary of this review on research findings related to empathy, empathy is vital to individuals’ quality of life, and deficits in empathy are associated with harmful characteristics that presumably inhibit an individual’s quality of life and potentially harm others’ lives. Thus, researchers have growing concern in the counseling field about wholesale decreases in empathy in emerging adults. In combination, a review of the literature illustrates the need for further examination of emerging adults’ empathy and, as it relates to this investigation, the contribution of online dating on emerging adults’ empathy.

Empathy and Relationships

Empathy is essential to healthy relationship development (Siegel, 2010; Szalavitz & Perry, 2008), and it is central to the success or failure of romantic relationships (Levenson & Gottman, 1985). Researchers identified that couples with higher levels of empathy have higher ratings of satisfaction and relationship success (Cramer & Jowett, 2010; Thomsen & Gilbert, 1998). However, empathy not only enhances relationships but also mitigates conflict, as individuals who possess empathy in romantic partnerships are more synchronous with one another during times of conflict (Thomsen & Gilbert, 1998) and can more accurately evaluate the negative emotions in their partner (Levenson & Ruef, 1992). Thus, researchers called for interventions to promote empathy development in romantic couples (Coutinho, Silva, & Decety, 2014). The following section reviews the work of Mikulincer, Shaver, Gillath and Nitzberg (2005), who investigated the relationship between attachment security (as measured by a revised form of the ECR; Brennan et al., 1998) and empathy through five studies in which various constructs were manipulated (e.g., attachment-security priming). In each study, the researchers performed four-step hierarchical regression analyses to investigate the contribution of attachment-style on compassion and empathy.

In their first study with a sample of North American ($n = 90$, 68 female, 19 to 30 years old) and Israeli ($n = 90$, 68 female, 18 to 33 years old) undergraduates, researchers (Mikulincer et al., 2005) identified a unique main effect for attachment avoidance for compassion ratings and willingness and agreement to help a suffering confederate woman (β s of $-.31$, $-.22$, and $-.21$, $ps < .01$). The researchers identified that higher scores on

attachment avoidance were associated with lower levels of rated compassion towards the confederate and expressed decreased willingness to help her. Further, a statistically significant main effect of attachment anxiety was identified $\beta = .26, p < .01$, which indicated that higher attachment-anxiety scores were associated with higher personal distress watching the confederate's distress.

The researchers' (Mikulincer et al., 2005) second study was nearly identical, except different strategies were used to prime the memory of attachment figures. In the second study with a sample of North American ($n = 90$, 56 female, 19 to 30 years old) and Israeli ($n = 90$, 64 female, 18 to 35 years old) undergraduates, researchers identified similar pattern attachment and empathy patterns. First, researchers identified a unique main effect for attachment avoidance ($\beta = -.37, p < .01$) for compassion ratings and willingness to help ($\beta = -.34, p < .01$) and agreement to help ($\beta = -.32, p < .01$) the confederate. Further, a statistically significant main effect of attachment anxiety was identified ($\beta = .24, p < .01$), which indicated that higher attachment-anxiety scores were associated with higher personal distress watching the confederate's distress.

Studies three through five (see Mikulincer et al., 2005) involved reading about a woman in financial distress (as opposed to watching a video of a confederate), and participants' responses were again measured in relation to their attachment with experimental examination or manipulation of priming conditions, mood-enhancement, empathic joy, or emotional closeness to the target. In study three ($n = 120$ North American undergraduates, 91 female, 18-34 years old; $n = 120$ Israeli undergraduates, 84 female, 18-30 years old), researchers identified statistically significant effects for

attachment anxiety ($\beta = .21, p < .01$) and main effects for attachment avoidance for compassion ($\beta = -.36, p < .01$) and willingness to help ($\beta = -.28, p < .01$). With continued consistency, study four ($n = 120$ North American undergraduates, 88 female, 17-31 years old; $n = 120$ Israeli undergraduates, 79 female, 19-39 years old), resulted in statistically significant effects for attachment anxiety ($\beta = .22, p < .01$) and main effects for attachment avoidance were statistically significant whereas the greater the avoidance of participants, the lower participants' compassion was rated ($\beta = -.35, p < .01$). Study 5 replicated the findings of studies one through four ($n = 120$ North American undergraduates, 92 female, 17-36 years old; $n = 120$ Israeli undergraduates, 86 female, 20-27 years old), in which researchers identified statistically significant effects for attachment anxiety ($\beta = .34, p < .01$) and main effects for attachment avoidance for compassion ($\beta = -.31, p < .01$) and willingness to help ($\beta = -.18, p < .01$).

Across the five studies and regardless of national sample, results indicated that “[...] attachment-security priming led to greater compassion and willingness to help a person in distress” (p. 835). The researchers concluded, “In all five experiments, attachment avoidance was associated with lower levels of rated compassion and willingness to help a suffering woman, whereas attachment anxiety was consistently associated with higher levels of personal distress that did not translate into helpful behavior” (p. 835). The findings of this study support the importance of attachment style in helping behaviors and empathic connection between individuals. However, it is necessary to note that attachment style was measured with the ECR (Brennen et al., 1998) and might have been vulnerable to errors in measurement (Fraley et al., 2011), and the

samples across all studies over-represented women and make it difficult to generalize results of this study to larger populations. Limitations notwithstanding, the results of these five studies provide support for the importance of empathy in emerging adults' romantic relationships as measured by attachment style.

Objectification of Others

In order to empathize with another human being, one must first experience the other person as human (Fiske, 2009). Some groups are minimized and perceived to be less than human (e.g., poor people, drug addicts) and some individuals are perceived as tools to be used and are objectified (Fiske, 2009). For the latter, Western society promotes a culture of hyper-heterosexuality in which women (Fredrickson & Roberts, 1997) – and more presently men (Frith & Gleeson, 2004) – are objectified and valued for superficial appearance-based features as opposed to one's personhood (Fredrickson & Roberts, 1997), with consequential implications for counselors (Moradi & Huang, 2008; Szymanski, Carr, & Moffitt, 2011). The following sections review the major tenets of objectification theory (Fredrickson & Roberts) and research associated with self-objectification and the objectification of others (Strelan & Hargreaves, 2005).

Objectification Theory

Fredrickson and Roberts (1997) offered a theoretical framework for understanding females' lived experiences in a sexually objectifying sociocultural context. The authors defined sexual objectification as “[...] the experience of being treated *as a*

body (or collection of body parts) valued predominantly for its use (or consumption by others” (p. 174). As such, the authors argued that sexual objectification enabled oppressive conditions and experiences including employment discrimination, sexual violence, and diminishment of females’ work and accomplishment.

A key component of Fredrickson and Roberts’ (1997) objectification theory is the practice of gazing. The authors described a consistent potential for objectification whenever a woman is looked at, highlighted by the media’s portrayal of women’s *body parts* rather than *women*. The authors recounted research indicated that women are gazed at more often than men (Hall, 1984) and that “[...] women are more likely to feel ‘looked at’” (Argyle & Williams, 1969). The authors recounted the literature on the pervasiveness of heterosexuality in western culture and argued that the normalcy of gazing at women through interpersonal encounters and in visual media encourages females to adopt an objectifying view of one’s self (i.e., self-objectification). The authors argued that, insidiously, individuals’ gaze at others and at one’s self is *not* an act of appreciation, but an act of evaluation.

Fredrickson and Roberts (1997) acknowledged arguments (see Unger, 1979) that female beauty equates to power for women. Similarly, some participants in a qualitative study (see Moffitt & Szymanski, 2011) who worked in an environment that enabled objectification (e.g., Hooters) contended that being objectified is “fun” or even empowering. However, Fredrickson and Roberts contested, “the value of this currency [power], however, may differ across subgroups of women. Arguably, for example, to be traded for social and economic power, a woman’s beauty must appeal to that tastes of the

dominant (White male) culture” (p. 178). Similarly, Fischer, Bettendorf, and Wang (2011) asked “[...] what happens when the next observer (particularly, one with power) disapproves or finds fault” (p. 132)? To illustrate this point, one participant from Moffitt and Carr’s (2011) qualitative study of the experiences of women in sexually objectifying environments reported on her experience as a waitress at Hooters, “I mean that’s the thing that bothers me most, if I walk up to a table and the customer won’t look at me or say anything because they’re so pissed because I’m not white with blonde hair and blue eyes” (p. 83). Indeed, the majority of women reported negative experiences with being sexualized (Moffitt & Szymanski, 2011), and their objectification – and consequential self-objectification - has been linked to a variety of clinical issues (e.g., sexual assault, body shame, lowered interoceptive awareness, depression, anxiety, disordered eating, substance abuse; for an overview, see Moradi & Huang, 2008; Szymanski, Moffitt, & Carr, 2011).

Fredrickson and Roberts (1998) argued that one’s view of self is based largely on physical attributes that appear to matter more in the formation of self-worth than academic accomplishment or behavioral merit (Harter, 1987). Thus, the consequences of internalizing an observer’s perspective results in shame, anxiety, hyper-awareness or self-consciousness, and distorted view of one’s own physical body and bodily needs, contributing to psychological dysfunction. Accordingly, researchers have worked to delineate treatment and clinical training implications for therapists regarding objectification (Moradi, 2011; Szymanski, Carr, & Moffitt, 2011).

Research on objectification theory. Researchers on objectification theory have

focused on women in the form of self-objectification. However, researchers are beginning to expand the lens of objectification theory to also examine couples, men, and minority groups (Heimerdinger-Edwards, Vogel, & Hammer, 2011; Moradi & Huang, 2008). In their review of the literature, Heimerdinger-Edwards and colleagues reported increasing rates of men being objectified. The authors suggested that men's experiences with objectification might be different from women's experiences, but their internalization of ideals affects their health similarly. In a review of a decade of research grounded in objectification theory, Moradi and Huang (2008) identified patterns that suggested males report lower levels of self-objectification, body surveillance, and body shame than females. However, overall, Moradi and Huang reported that males and females' experience similar levels of negative associations with self-objectification, with some cases being larger for women and fewer cases being larger for men.

Other researchers acknowledged that objectification happens to both men as well as women, but emphasized that it affects men and women differently based on the meaning attributed to being objectified (Fischer et al., 2011). Fischer and colleagues (2011) suggested further explorations of the meaning of being objectified across identities (e.g., gender, sexual orientation, and social class). Heimerdinger-Edwards and colleagues (2011) emphasized the effect of objectification on the formation and experience of romantic relationships through decreased intimacy and the adoption of unrealistic sexual standards. Thus, the researchers encouraged future research investigating relational factors in accordance with objectification theory.

Since its origination, objectification theory has been used as a lens to examine a

variety of constructs as it relates to women's experiences of being objectified (i.e., self-objectification). Fischer and colleagues (2011) provided commentary on the direction of this research and suggested that future studies should move from external consequences of objectification (e.g., sexual assault, substance use; see Szymanski, Moffitt & Carr, 2011), back to individuals' intrapsychic processes (e.g., body shame, body surveillance). Further, Fischer and colleagues and Moradi (2011) suggested that researchers contextualize the environments in which objectification occurs (e.g., occupational settings, restaurants) by the degree to which it occurs rather than categorically labeling objectification as present or not.

In summary, researchers defined objectification theory to explain individuals' adoption of mainstream cultural standards for beauty and the consequential self-objectification that follows when individuals are objectified. Objectification is a phenomenon theorized to originate in the sociocultural context of Western society where an individual is evaluated by his or her physical appearance as opposed to the individual's personhood. Researchers (e.g., Carr & Szymanski, 2011; Fredrickson & Roberts, 1997) have noted a connection or a cycle between individuals' experiencing objectification and their consequential internalization of others' perspective and values (i.e., self-objectification). Expanding on the cycle, Strelan and Hargreaves (2005) noted the relationship between self-objectification and other-objectification, proposing that individuals who are objectified and self-objectify may look to others to establish comparisons, which ultimately increases the objectification of others and the increased likelihood of the *other's* self-objectification behaviors, further perpetuating the cycle. The

following section delineates theory related to the objectification of others and research associated with the objectification of others.

Objectification of Others

Fredrickson and Roberts' (1997) defined sexual objectification as valuing an individual's body in its appearance in an evaluative way – as a means to an end. Focusing on the process of objectification, Heflick and Goldberg (2014) argued that individuals who objectify others – rather than those who are objectified – attribute less traits to others that distinguish them from people. Though their literature review focused on research related to women, they reported that women (and presumably all people) who are objectified behave “[...] in a more objectlike manner” (p. 228). The following section reviews the literature on the objectification of others (i.e., other-objectification).

Brand, Bonatsos, D’Orazio, and DeShong (2012) reviewed the literature on attractiveness in individuals and cited multiple studies (see Dion, Bersheid, & Walster, 1972; Gross & Crofton, 1977) and meta-analyses (see Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992) supporting conclusions that people assign personality traits to attractive people. In summary of their review, the researchers reported, “[...] people tend to think physically attractive individuals have other attractive qualities” (p. 166). At face value, beliefs that attractive individuals have other attractive qualities might appear to be a positive phenomenon; however, it supports an alternate theory on objectification of others “[...] where a body focus does not diminish the attribution of all mental capacities, but, instead, leads perceivers to infer a different kind of mind” (p. Gray,

Knobe, Sheskin, Bloom, & Barrett, 2011, p. 1207).

Loughan and colleagues (2010) argued that objectification of others is not merely an emphasis on the body, but rather a denial of one's personhood and humanity. With a sample of emerging adults ($N = 86$, 54 female, $M = 20.5$ years of age, $SD = 3.0$ years), participants viewed three photographs featuring either (a) a full-body image of a woman (e.g., head and body), (b) a head-only image of a woman, or (c) a body-only image of a woman, and completed the *Mental State Attribution* task (MSA, Haslam, Kashima, Loughan, Shi, & Suitner, 2007) and the *General Mind Attribution* task (GMA; Loughan et al., 2010) to assess participants' perception of the images' sense of emotionality.

The researchers conducted a 3 (image type) X 2 (participant gender) mixed model ANOVA for MSA score ($\alpha = 0.88-0.94$) with image type as a within-subjects variable (Loughan et al., 2010). The authors identified a statistically significant main effect of image type, $F(2, 81) = 11.84, p < 0.001, \eta^2_p = 0.23$. The authors reported that the effect was not qualified by participant gender ($p > 0.5$). The authors reported that head-only images received higher ratings of mental state attribution ($M = 4.68, p < .05$) compared to full-body images ($M = 4.56, p < .05$) and the lowest rated body-only image ($M = 4.32, p < .05$). The authors reported similar results for the GMA scale, which also revealed a statistically significant main effect of image type ($F(2, 81) = 13.18, p < 0.001, \eta^2_p = 0.24$), which was also not qualified by participant gender ($p > .70$). Further analysis revealed a statistically significant difference between head-only ($M = 4.86, p < .05$) and body-only ($M = 4.13, p < .05$) images. After averaging the two items that measured General Moral Status, the researchers conducted another 3 (image type) X 2 (participant

gender) ANOVA with image type as within-subjects variable. The researchers identified a statistically significant main effect of image type ($F(2, 81) = 4.11, p < 0.05, \eta^2_p = 0.09$), which was not qualified by participant gender ($p > .030$). The authors reported statistically significantly lower scores for the body only image ($M = 6.00, p < .05$). Lastly, the authors reported strong reliability for all image scores on the Experience Scale ($\alpha = 0.85-0.88$) and conducted a 3 (image type) X 2 (participant gender) ANOVA with image type as a within-subjects variable. The researchers identified a statistically significant main effect of image type ($F(2, 81) = 11.26, p < 0.001, \eta^2_p = 0.22$), which was not due to participant gender ($p > .40$). The researchers reported that all image ratings statistically significantly differed with the head-only photo receiving the highest score ($M = 6.25, p < .05$) compared to the full-body image rating ($M = 6.21, p < .05$) and the body-only image ($M = 6.00, p < .05$).

Loughan and colleagues (2010) concluded that participants might be willing to depersonalize (i.e., objectify) highly-objectified others (i.e., body-only images) and, to a lesser degree, less objectified images (i.e., full-body). Although, the results were limited by several shortcomings including (a) the absence of male images, (b) unequal gender ratio of participants, and (c) the authors did not specify the sample of the study, making it difficult to generalize the findings from this study to larger populations. Despite these noted limitations, the authors replicated their findings with similar results in a second study that included a more diverse sample ($N = 80, 40$ female, $M = 19.2$ years old, $SD = 2.44$) as well as the inclusion of male targets. Thus, it could be inferred that individuals who objectify others treat others as if they lack mental capacity and moral status

associated with humanity.

Strelan and Hargreaves (2005) conducted one of the first studies to explore the question of what leads individuals to objectify others. The researchers investigated the relationship between self-objectification and the objectification of others with a sample of 132 undergraduate college students and their non-collegiate friends from Australia (64 female, $M = 20.7$ years old, $SD = 1.8$ years, 68 male, $M = 21.0$ years old, $SD = 2.5$ years). The researchers used Noll and Fredrickson's (1998) *Self-Objectification Questionnaire* (SOQ), composed of 10 items – five related to physical attributes (e.g., weight, sculpted muscles) and five related to competence based attributes (e.g., health, strength) – that participants rank on a scale of 1 (least important) to 10 (most important). The result of the difference between the sum of physical traits and competence based traits results in a score ranging from -25 to 25, with higher scores indicating self-objectification. The authors then modified the same scale but asked participants to rank the items in relation to *other* people's bodies, resulting in Strelan and Hargreaves' *Objectification of Others Questionnaire* (OOQ). Participants in this investigation completed the OOQ in relation to men's bodies and women's bodies. Participants also completed an adaption of the *Body Cathexis Scale* (Slade, Dewey, Newton, & Brodie, 1990) to measure participants' body satisfaction. The researchers reported internal reliability for women at $\alpha = 0.87$ and for men $\alpha = 0.60$. Psychology students completed the assessments in class, and then administered the same assessments to a friend of the opposite sex, who then mailed the results to the researchers.

Strelan and Hargreaves (2005) identified that females had greater levels of self-

objectification ($M = -3.89$, $SD = 14.78$) than men ($M = -9.91$, $SD = 11.98$), $t(129) = 2.57$, $p < .05$. Further, the researchers noted that 43% of women ($n = 27$ of 64) reported self-objectification scores greater than a midpoint of 0, compared to 24% of men ($n = 16$ of 68). Self-objectification scores were negatively related to body satisfaction for women ($r = -.40$, $p < .01$) but not for men ($r = -.17$, $p > .05$). Most notably, as this study was the first study to investigate rates of other-objectification, the researchers identified that men objectified women ($M = 5.46$, $SD = 13.33$) more than they objectified other men ($M = -7.00$, $SD = 13.95$), $t(63) = 5.64$, $p < .001$. Researchers identified that women also objectified other women ($M = 0.13$, $SD = 15.43$) more than they objectified men ($M = -1.78$, $SD = 12.16$), but the difference was not statistically significant ($t(63) = 1.52$, $p > .05$). The researchers reported that women were more likely to objectify other women than to self-objectify ($t(63) = 2.57$, $p < .05$), and though *not* statistically significant, men were more likely to objectify other men than themselves ($t(65) = 1.49$, $p > .05$). Lastly, men objectified women more than women objectified other women ($t(127) = 2.26$, $p < .05$), and men objectified other men less than women objectified men ($t(127) = 2.10$, $p < .05$). The researchers argued that women and men who self-objectify were more likely to objectify women, though the relationship was stronger for women ($r = .69$, $p < .001$) than for men ($r = .27$, $p < .05$). Further, women and men who objectify themselves were also more likely to objectify men, and this relationship was also stronger for women ($r = .52$, $p < .001$) than for men ($r = .26$, $p < .05$). Women had strong relationships between the objectification of other women and men ($r = .76$, $p < .001$), however men's objectification of women and other men was unrelated ($r = .19$, $p > .05$).

To summarize the results of Strelan and Hargreave's (2005) investigation, the researchers identified that females self-objectify more than males, which is linked to lower body satisfaction among women. Similarly, this investigation supported the notion that men objectify women more than they objectify men. Also, men objectify women more than women objectify women. Furthermore, the researchers identified that men are objectified less in comparison by both men and women. The researchers concluded that women who self-objectify might exume a preoccupation with appearance that they then project onto women more than men, as would theoretically be expected (Fredrickson & Roberts, 1997), and that women place greater importance on other women's appearance than their own. While, more research is needed to investigate the causation of the relationships between self-objectification and other-objectification, the findings from this investigation support the theory that individuals who are objectified will objectify others, perpetuating a cycle of objectification. Results notwithstanding, it is necessary to note that this research study might have been limited by having undergraduate psychology students administer the assessment to friends as opposed to researchers; and it is also necessary to note that the sample was attained through convenience and snow-ball sampling, thus limiting the ability to make generalizations about the results of the investigation.

Further exploring the antecedents of other-objectification, Swami and colleagues (2010) conducted a series of three studies with a total of 1,158 participants from a British community to investigate the associations between sexist beliefs, other-objectification, media exposure, and distinct beauty ideals and practices. In their first study, researchers

used convenience sampling to attain participants ($N = 351$, 183 female), who then completed a series of measurements with established assessment instruments (see Sawmi et al., 2010). Swami and colleagues used the OQ (Strelan & Hargreaves, 2005) and the *Photographic Figure Rating Scale* (PFRS; Swami et al., 2008) – an instrument composed of 10 gray scale photographs of real women and their bodies with two images per *Body Mass Index* (BMI) category, where participants rate the figures they find most and least physically attractive in relation to size (e.g., largest, thinnest).

The researchers (Swami et al., 2010) reported that a regression with the figure rated most attracted resulted in statistical significance ($F(8, 181) = 5.08, p < .001, \text{adj. } R^2 = .17$), and objectification of others ($\beta = -.22, t = -3.11, p = .007$) statistically significantly predicted ratings of a thinner body as attractive. The researchers also identified that when the attractiveness range – as opposed to one ideal body type – was entered as the dependent variable, the regression for women was statistically significant ($F(8, 181) = 2.97, p < .001, \text{adj. } R^2 = .08$), and participants' greater tendency to objectify others was associated with a narrower attractiveness range ($\beta = -.32, t = -4.03, p = .007$). The results of this investigation highlighted that women with a greater tendency to objectify others adopt sociocultural standards for beauty where thinner figures were identified as maximally attractive and a preference for figures with narrower body styles. The researchers theorized, “[...] given women are the primary targets of objectification (via the male gaze), they may internalize the belief that women must be thing to be valued” (p. 371).

The researchers conducted a second study similar to their first study but in regard

to individuals' height rather than weight (Swami et al., 2010). Researchers employed the same measurement instruments as the first study, including a measurement regarding lifetime exposure to Western media (i.e., television, movies, magazines, music). The researchers reported that the media exposure assessment had strong psychometric properties per the researchers' exploratory factor analysis (see Swami et al., 2010) and was slightly correlated with participants' ($N = 383$; 218 female) scores on the OOQ ($r = .14, p < .05$; 2% of the variance explained). While this was not the primary investigation of study two, it is noteworthy that small relationships existed between participants' objectification of others and their exposure to media. Regarding the influence of culture on objectification of others, these findings support the theorized assumption that media consumption is related to objectification of others and the adoption of ideal body standards, despite the limited evidence reported on the media exposure assessments' validity.

In their third study, researchers investigated the endorsement of cosmetic use amongst a sample of 424 British individuals (266 male; Swami et al., 2010). The researchers identified a statistically significant regression for women's cosmetic use ($F(8, 157) = 7.80, p < .001, \text{Adj. } R^2 = .27$), with tendency to objectify others having statistically significant predictive value ($\beta = .29, t = 4.20, p < .001$). Similarly, for men the regression was also statistically significant ($F(8, 265) = 3.87, p < .001, \text{Adj. } R^2 = .09$), with tendency to objectify others also having statistically significant predictive value ($\beta = .16, t = 2.48, p = .016$). In light of these findings, the researchers reported, "[...] cosmetic use may focus attention away from women's abilities and reinforce

notions of women as decorative objects that remain in passive and subordinate roles” (p. 375). However, the researchers also noted a discrepancy in how males and females were surveyed in that men procedurally were asked to respond to questions in relation to what women *ought* to do, whereas women were asked to respond to what they *actually* do in relation to cosmetic use, thus impairing the ability to compare results between sexes.

In their first and third study, Swami and colleagues (2010) identified statistically significant correlations between participants’ objectification of others and their hostility towards women (as measured by the *Hostility Towards Women Scale*; Lonsway & Fitzgerald, 1995). In their first study, this relationship was modest ($r = .21, p < .01$) and in the third study it was small ($r = .18, p < .05$). While these associations demonstrated small effect sizes, the examination of these relationships was not the primary focus of the three studies. The researchers identified a theoretically concerning relationship between these constructs that indicates that those who objectify others through an evaluation of their physical components hold restrictive beliefs about the appropriate roles, behaviors, and identities for women.

Throughout all three studies conducted by the researchers (Swami et al., 2010), participants’ age was correlated with their objectification of others (study 1 [$r = -.22, p < .001$], study 2 [$r = -.16, p < .05$], study 3 [$r = -.28, p < .01$]). The implications of a relationship between objectification of others and age - whereas perhaps younger individuals are more vulnerable to the adoption of cultural standards of beauty and the evaluation of others’ bodies – lend support to the hypothesis of this researcher’s investigation that emerging adults’ objectification of others might be particularly

influenced by environments that promote evaluation of others (e.g., online dating).

Though, it is necessary to note the small size of these relationships.

Overall, the three studies conducted by Swami and colleagues (2010) highlighted the endorsement of beauty ideals by individuals who objectify others and the adoption of hostile sexism in their evaluation of others' bodies. Further, while not the focus of the study, the researchers established relationships between participants' age and their objectification of others, promoting an exploration of emerging adults' objectification of others. However, it is necessary to note that convenience sampling limits the ability to generalize to larger populations from these findings, and this sample was limited to individuals in and around London, England.

Continuing to explore the cycle of objectification, Davidson, Gervais, and Sherd (2015) examined the relationship between stranger harassment on self-objectification and objectification of others with a sample of 495 undergraduate women from a U.S. Midwestern university ($M = 19.89$ years old, $SD = 2.09$). The researchers used the *Stranger Harassment Inventory* (Fairchild & Rudman, 2008) to measure participants' experiences of harassment from strangers, the *Objectified Body Consciousness Scale* (OBCS, McKinley & Hyde, 1996) to measure self-objectification through factor scores on body surveillance, body shame, and control beliefs, and the OOQ (Strelan & Hargreaves, 2005) to measure objectification of others. The researchers reported that total stranger harassment scores were related to body surveillance ($r = .241, p < .01$) and other-objectification of women ($r = .133, p < .05$). However, when the researchers used subscale scores rather than total scores (e.g., verbal harassment, sexual pressure), verbal

harassment was related to other-objectification of women ($r = .130, p < .05$) and other objectification of men ($r = .111, p < .05$). Further, the researchers established bivariate correlations between greater levels of body surveillance and greater levels of other-objectification of women ($r = .286, p < .01$) and other objectification of men ($r = .174, p < .01$). As a whole Davidson and colleagues reported that participants objectified women ($n = 319$) at greater rates ($M = 2.81, SD = 13.31$) than men ($n = 320; M = -1.02, SD = 11.42$).

The researchers (Davidson et al., 2015) tested two mediation models: (a) the first of which examined total stranger harassment as a predictor and (b) the second using verbal harassment and sexual pressure as separate predictors. In the first model, researchers identified direct relationships between body surveillance ($R^2 = .058$) and other-objectification of women ($\beta = .249 [B = 3.039, SE = .641], p < .001, R^2 = .071$) and other-objectification of men ($\beta = .166 [B = 1.725, SE = .561], p < .01, R^2 = .034$). In the second model, the researchers identified positive direct relationships between body surveillance ($R^2 = .056$) and other-objectification of women ($\beta = .253 [B = 3.082, SE = .643], p < .001, R^2 = .075$) and other-objectification of men ($\beta = .170 [B = 1.77, SE = .555], p < .01, R^2 = .057$).

The findings of this research investigation (Davidson et al., 2015) identified that more stranger harassment predicts more self-objectification (i.e., body surveillance) as well as objectification of others (both of females and males). The results of this study support the existence of the cyclical relationship between an individual's experience of objectification, adoption of others' view to evaluate oneself (i.e., self-objectification) and

the consequential objectification of others, which in turn perpetuates the cycle. Though, it is necessary to note that some participants incorrectly responded to the OOQ for women and men by failing to rank items, and thus improper responses were omitted. However, participants' responses were retained on other measures, which may have affected the findings in this study. Further, it is necessary to note the cross-sectional nature of the data does not provide evidence for causality; and the findings in this study might be limited to individuals in the sample - predominantly young, white, female college students.

In total, individuals' self-objectification is associated with a variety of negative consequences for the individual; and self-objectification is presumed to be resultant of adopting societal views and standards for beauty by being objectified. Researchers suggested that those who self-objectify may objectify others to establish comparisons between one's self and others, which in turn promotes other individuals' self-objectification and the consequential perpetuation of the objectification cycle. Theoretically, individuals who objectify others do so as a means of evaluation, which inherently inhibits empathy for others, potentially impairing relationships. The following section reviews the associations between objectification of others and romantic relationships.

Objectification of Others and Romantic Relationships

DeVille, Ellmo, Horton, and Erchull (2015) examined the role of romantic attachment (as measured by the *Experiences in Close Relationships* short form (ECR-R, Wei, Russell, Mallinckrodt, & Vogel, 2007) in relation to women's experience of self-

objectification (e.g., body shame, body surveillance [as measured by the *Objectified Body Consciousness Scale*, McKinley & Hyde, 1996]) with a sample of 193 mostly heterosexual (76.2%) white (83.4%) women between the ages of 18 and 30 ($M = 21.72$, $SD = 3.26$). Researchers identified a modest relationship between avoidant attachment styles and body surveillance ($r = .17$, $p < .01$), and a modest relationship between anxious attachment styles and body shame ($r = .17$, $p < .01$), and a moderate relationship between anxious attachment styles and body surveillance ($r = .31$, $p < .001$). The researchers identified a model between the constructs in which avoidant and anxious attachment explained 13.6% of the variance in surveillance ($p = .003$), and attachment style and body surveillance explained 43.8% of the variance in body shame ($p < .001$). The researchers also identified indirect effects of avoidant ($z = 2.53$, $p = .01$) and anxious attachment ($z = 2.53$, $p = .01$) on body shame through surveillance. The findings of this study support the importance of romantic relationship attachment on women's experience of self-objectification. However, it is necessary to note the largely homogenous sample used in this study as well as the reliance on snowball sampling techniques, which may impair generalizability of the findings of this study.

Regarding the counseling implications of objectification theory on relationships, Zurbriggen, Ramsey, and Jaworski (2011) investigated the influence of objectifying media on self-objectification, partner objectification, relationship satisfaction, and sexual satisfaction in a sample of 159 white (67.9%) emerging adults (91 female, $M = 18.98$ years old, $SD = .30$; 68 male, $M = 19.13$ years old, $SD = .38$). To measure objectifying media, participants rated how often they viewed various genres of media (e.g., television,

film, magazines, and Internet sites) and the duration of time in hours per week interacting with that media. Next, a panel of experts rated how objectifying the media format and content was, and researchers assigned weighted means to participants' media use. Researchers also used modified versions of McKinley and Hyde's (1996) *Objectified Body Consciousness scale* to measure self-objectification and partner-objectification as well as *the Relationship Assessment Scale* (Hendrick, 1988; Hendrick, Dicke, & Hendrick, 1998), and one item to measure sexual satisfaction.

Results from the study (Zurbriggen et al., 2011) indicated the relationship between self-objectification and partner-objectification in men ($r = .547, n = 68$) as larger than it was for women ($[r = .185, n = 91], z = 2.61, p = .009$). As a whole, self-objectification was modestly related to relationship satisfaction ($r = -.169, p < .05$) and partner-objectification was moderately related to relationship satisfaction ($r = -.379, p < .001$). Researchers identified a strong model fit ($X^2[2] = .96, p = .62, NFI = .99, CFI = 1.00, IFI = 1.01, MFI = 1.00, GFI = 2.00, \text{standardized RMR} = .02, \text{RMSEA} = .00 [\text{CI} = .00, .13]$). The researchers reported that the predictor variables accounted for 22.7% of the variance in objectification of partner and 15.3% of the variance in relationship satisfaction. Additionally, the researchers reported that objectifying media use was marginally associated with partner-objectification ($t = 1.925, p = .06$) and the researchers reported that partner-objectification was associated with lower levels of relationship satisfaction ($t = -4.44, p < .0001$), albeit only marginally reliable indirect path ($z = 1.77, p = .08$). Unique for men, males had a statistically reliable moderate negative relationship between sexual satisfaction and self-objectification ($r = -.520, n = 31, p = .003$) and a

statistically significant and reliable moderate negative relationship between sexual satisfaction and partner-objectification ($r = -.440, n = 31, p = .013$). Whereas, the relationship between sexual satisfaction and self-objectification was not statistically significant for women ($p = .405$) and neither was the relationship between sexual satisfaction and partner-objectification ($p = .276$).

The results indicated that partner-objectification lowers romantic relationship satisfaction, and even sexual satisfaction in men (Zurbriggen et al., 2011). Further, the findings from this study provide evidence that consuming objectifying media is related to partner-objectification. The researchers concluded that viewing one's partner as an object harms one's romantic relationship, even if the mechanism that causes the harm is currently unknown. While this study explored objectifying media, online dating was not included in the study as a construct or genre of media. Therefore, findings from the researchers' study provide further support for current investigation to examine the influence of online dating on emerging adults' objectification of others as well as their empathy and quality of romantic relationships. However, researchers noted that they used a weak assessment used to measure partner-objectification and that participants in a relationship were for short durations - given participants' age - thus limiting some of the power of the study's findings. Therefore, the researchers encouraged future studies to continue to explore objectification (Zurbriggen et al., 2011), perhaps including variables such as empathy, further providing support for the current research investigation.

In summary, researchers (Fischer, Bettendorf, & Wang, 2011; Heimerdinger-Edwards, Vogel, & Hammer, 2011; Moradi, 2011) have lauded the keystone work of a

series of articles written in *The Counseling Psychologist* (see Carr & Szymanski, 2011; Moffitt & Szymanski, 2011; Szymanski, Carr & Moffitt, 2011; Szymanski, Moffitt, & Carr, 2011). However, research on objectification is not complete (Szymanski & Carr, 2011). Researchers plea for clinicians, educators, and researchers alike, to “[...] effect change in the broader social context to reduce the frequency of occurrence and negative effects of externalized and internalized sexual objectification and other forms of oppression on mental health” (Szymanski & Carr, 2011, p.165). Providing commentary on the current state of objectification research, Szymanski and Carr (2011) reported that a spirit exists in the helping professions to advocate for social justice and adopt multicultural lenses to their work, but that clinical and educational work, and research, falls short of reaching those aspirations. Therefore, with the authors’ contention that researchers need to continue to think “outside the box” and attend to social context, one of the purposes of this research study is to investigate the contribution of online dating on the objectification of others. Further, in continuation of Fischer and colleagues’ (2011) recommendation, this investigation focused on the intrapsychic process of objectification of others as it relates to empathy within the context of online dating. Furthermore, this investigation provided greater exploration of the effect of other-objectification on romantic relationships.

Social Communication Technology

The Internet, as the latest technological advancement, allows individuals to communicate with others over great distances (Bargh & McKenna, 2004). However, the

Internet has *not* developed in isolation; technology hardware has continued to progress as well, enabling Internet connection through televisions, video game systems, computers, and handheld devices (e.g., cell phones, tablets, laptops). Consequently, access to this technology and utilization of these devices and the Internet have increased over time (Lenhart, 2015). As such, researchers have investigated adolescent, emerging adult, and adult use of these devices and activities (e.g., texting, social media), but have failed to identify a consistent construct to measure. For example, Cyr and colleagues (2015) measured “communication technology” as defined by text messaging, e-mailing, instant messaging, and use of social networking sites. Rappleyea, Taylor, and Fang (2014) used the same label of “communication technology,” but their definition included cellular phone talking, cellular phone texting, e-mail, Facebook, MySpace, instant messaging, and dating websites. Other researchers have used other labels entirely. For example, Fletcher and Blair (2014) investigated adolescents’ social technology use, which they defined as cellular telephone use, e-mail, instant messaging, and chat rooms. Similarly, Craig, McInroy, McCready, DiCesare, and Pettaway (2015) measured “information and communication technologies” as defined by Internet use, social media use, and photo/video sharing. Therefore, the researcher of this investigation will use the label *Social Communication Technology* (SCT) to broadly and briefly review the literature related to technology used in a social and interpersonal context (e.g., texting, instant messaging, social media), prior to reviewing the literature specifically related to online dating.

While SCT is an educational tool and source of media entertainment, it has also

been at the center of debate in its role in facilitating or harming relationships. One reason for researcher interest in online communication is the unique properties associated with its use (Hertlein & Stevenson, 2010), such as the ability to communicate privately in both immediate and delayed forms (Barak, 2007). Further, Suler (2010) addressed the “Online Disinhibition Effect” associated with sending and receiving messages, where individuals communicating without nonverbal cues can easily exaggerate or escalate a conversation beyond one’s intention. The majority of researchers generally “[...] view online communication as a weaker form of interaction — the cost of which could be increased risk of depression and/or social isolation” (Best et al., 2014, p. 33).

Bargh and McKenna (2004) cited two key studies from a series of initial research investigations on Internet use (see Kraut et al., 1998; Nie & Erbing, 2000) that concluded Internet use led to neglect of close relationships and increases in depression and loneliness. However, Bargh and McKenna also reported that relevant studies and surveys completed since then – including a follow up study by Kraut and colleagues (see Kraut et al., 2002) – either failed to identify negative consequences of Internet use or identified greater levels of individual adjustment associated with Internet use in psychological and social outcomes. Other researchers have commented on the contrasting findings of research studies (see Nie, 2001) and suggested that differences between users and non-users of the Internet are possibly founded more in base sociological factors (e.g., social connectivity, education, financial success) than Internet use. In their review of the literature, Bargh and McKenna (2004) concluded “[...] The Internet does not make its users depressed or lonely, and it does not seem to be a threat to community life – quite

the opposite” (p. 586). However, the authors cautioned that Internet communication – due to its bypassing of nonverbal communication – might allow individuals to assign attributes and assumptions to others who they do not know in face to face relationships. Aforementioned conclusions notwithstanding, it is necessary to note that these studies were all conducted over ten years prior to this investigation, and the Internet – as well as the technology used to access it – has continued to evolve, though the deficit in nonverbal communication has remained consistent (Riva, 2002).

In recent years, studies have investigated more specific constructs related to SCT use (e.g., social capital [Ellison, Steinfield, & Lampe, 2007], social isolation [McPherson, Smith-Lovin, & Brashears, 2006], cyber-bullying [Juvonen & Gross, 2008]), and their associations (e.g., compulsive Internet use [van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008], and preference for Internet use in communication [Cyr et al., 2015]). Overall, researchers are beginning to identify a balance between positive and negative associations with SCT (Bryant, Sanders-Jackson, & Smallwood, 2006). To better understand the variance in results reported on the influence of SCT, a brief review of the literature is warranted. However, much of the research examining the influence of SCT on a variety of variables related to identity, well-being, and relationships have been conducted with adolescents (see Best et al., 2014; Cyr et al., 2015; Ohannessian, 2009). Therefore, even though emerging adults are a population distinct from adolescents, a brief review of the literature regarding the influence of SCT on adolescents will promote an inferred and theoretical understanding of the influence of SCT use on emerging adults.

Research on SCT and Adolescents

Ohannessian (2009) conducted a literature review and reported that some studies have identified statistically significant relationships between adolescent Internet use and adolescent psychological problems (see Kraut et al., 1998) while others have not (see Gross, Juvonen, & Gable, 2002; Gross, 2004). Ohannessian reported that “differences in methodology, samples, and measures may account for the discrepancy in findings across these studies. It also is important to note that these studies included small and/or non-representative samples” (p. 583). Ohannessian surveyed 14 to 16 year old adolescents ($N = 328$, 58% female) in 9th and 10th grade public high schools in the Northeast United States (41% Caucasian, 22% African-American, 24% Hispanic, 5% other). Participants completed a self-report survey measuring media use on a 6-point Likert scale regarding hours spent using media (e.g., 1 = none, 2 = less than 1 hour, 3 = about 1 hour, 4 = about 2 hours, 5 = about 3 hours, and 6 = 4 or more hours), and additional assessment instruments included the *Center for Epidemiological Studies Depression Scale for Children* (CES-DC; Weissman, Orvaschell, & Padian, 1980), and the *Screen for Child Anxiety Related Disorders* (SCARED; Birmaher, Khetarpal, Cully, Brent, & McKenzie, 1995). Participants completed the survey twice about a year apart. However, some students only participated in one measurement point; thus the researcher compared differences between longitudinal and non-longitudinal samples and only found differences in text messaging and video game playing where the longitudinal sample had higher levels of text messaging ($X^2 [1] = 3.90, p < .05$) and the non-longitudinal sample had higher levels of video game playing ($X^2 [1] = 4.13, p < .05$).

The sample in this study (Ohannessian, 2009) reported spending about 1 hour per day using the Internet ($M = 3.19$, $SD = 1.61$), about 1 hour per day e-mailing and IMing (i.e. instant messaging; $M = 2.76$, $SD = 1.66$), and less than 1 hour per day text messaging ($M = 2.16$, $SD = 1.53$). The researcher reported that the cross-sectional anxiety models were statistically significant for e-mailing/IMing ($F [7, 286] = 218$, $p < .05$) and text messaging ($F [7, 287] = 2.26$, $p < .05$), and interaction effects were not statistically significant, nor were depression models or longitudinal models for either anxiety or depression. Regarding Internet use, the cross-sectional anxiety model was statistically significant ($F [7, 286] = 3.02$, $p < .01$), and a main effect for “surfing the web” was not found. The longitudinal anxiety model was also statistically significant for Internet use ($F [7, 154] = 2.13$, $p < .05$), and a main effect was found ($F [7, 154] = 6.02$, $p < .05$), indicating that adolescents who “surf the web” to a greater degree (two hours or more per day) were more anxious than those who spent less time on the Internet. While this study was limited by small sample size for a longitudinal study and its reliance on self-report data, it does identify relationships between Internet use and clinical issues – specifically anxiety – in relation to Internet use and texting, e-mailing, and IMing. It can be inferred from this study that emerging adults who use the Internet for two or more hours may also experience anxiety compared to individuals who use it for shorter lengths of time. It is important to note that texting and emailing were *not* associated with anxiety or depression, thus these findings may differ for emerging adults.

Cyr, Berman, and Smith (2015) examined adolescent peer relationships, identity development, and psychological adjustment in relation to communication technology use

with sample of high school students from Central Florida ($N = 268$). Participants were recruited from three public high schools ($n = 88$, $M = 16.55$ years old, $SD = .73$; $n = 56$, $M = 16.25$ years old, $SD = 1.18$; $n = 123$, $M = 15.85$ years old, $SD = .83$) and the overall sample was 69% female; 81.9% White, 7.5% Hispanic, 3% Black, 1.5% Asian, and 5.6% of mixed race or other. The sample included 30.7% Freshmen, 28.5% Sophomores, 34.8% Juniors, and 6.0% Seniors. The researchers distributed the *Ego Identity Process Questionnaire* (EIPQ; Balistreri, Busch-Rossnagel, & Geisinger, 1995), the *Identity Stress Survey* (IDS, Berman, Montgomery, & Kurtines, 2004), the *Existential Anxiety Questionnaire* (EAQ, Weems, Costa, Dehon, & Berman, 2004), the *Peer Conflict Scale* (PCS, Marsee & Frick, 2007; Marsee, Weems, & Taylor, 2008), the *Experiences in Close Relationships* (ECR, Brennan et al., 1998), and the *Brief Symptom Inventory-18* (BSI-18; Derogitis, 2000). To measure technology use, the researchers created a measure called the *Technology Usage Scale* (TUS), which asked participants about their use of communication technology (e.g., texting, instant messaging, twitter, social networking). The TUS consisted of two subscales related to time spent using communication technology (CT Time) and preference to use communication technology for interpersonal communication (CT Preference). The CT Time scale is composed of eight questions followed by five possible time-coded responses (e.g., “5 = More than 4 hours per day”), whereas the CT Preference scale consisted of 31 items for which participants responded on a five point Likert-scale ranging from strongly disagree to strongly agree. The researchers reported internal consistency for the CT Time scale at 0.71 and for the CT Preference scale at 0.92. Participants’ scores for CT Time ranged from 1 to 4.5 (1 = Not

at all, 2 = Less than half an hour per day, 3 = Between half an hour and 2 hours per day, 4 = Between 2 and 4 hours per day, and 5 = More than 4 hours per day; $M = 2.46$, $SD = 0.60$), suggesting that high school adolescents reported using communication technology for about a half hour to little more than two hours per day.

Regarding CT Preference, scores ranged from 1 to 3.68 ($M = 1.99$, $SD = 0.60$), suggesting that participants generally did *not* prefer to use communication technology to interact socially. Cyr and colleagues (2015) conducted a Multivariate Analysis of Variance (MANOVA) in regard to all psychological variables (e.g., identity exploration, identity commitment, identity distress, existential anxiety, psychological symptom severity, relationship avoidance, relationship anxiety, and peer conflict), and identified no statistically significant main effects for gender or grade, nor an interaction effect. The researchers conducted a second MANOVA in regard to CT Time and CT Preference and identified no statistically significant difference in gender in relation to CT Time. However, the researchers identified males as having greater CT Preference (Wilks' Lambda = .97; $F(2, 231) = 4.25$, $p = .015$); the authors did *not* identify a statistically significant main effect for grade and they did *not* identify an interaction effect. The researchers identified CT Time as statistically significantly correlated with internalizing symptom severity ($r = .26$, $p < .001$), identity distress ($r = .16$, $p = .012$), peer aggression ($r = .32$, $p < .001$), and existential anxiety ($r = .17$, $p = .005$). It is also worthy to note that CT Time was statistically significantly but negatively correlated with relationship avoidance ($r = -.20$, $p = .001$). Further, CT Preference was statistically significantly correlated with peer aggression ($r = .28$, $p < .001$), relationship anxiety ($r = .21$, $p =$

.001), and existential anxiety ($r = .20, p = .001$).

Related to the current investigation, Cyr and colleagues (2015) performed several One-Way ANOVAs to determine if romantic attachment style or identity status varied by CT Time or CT Preference. The researchers found no differences between attachment styles or between identity status groups based on CT Preference, nor any statistically significant differences between identity status and CT Time. However, regarding CT Time, the researchers reported a statistically significant difference between romantic attachment styles ($F [3, 255] = 6.23, p < .001$), and conducted a Scheffe post hoc analysis to identify that individuals with preoccupied attachment styles (i.e. *anxious attachment*; high anxiety, low avoidance) spent statistically significantly more time ($p < .05$) using communication technology than participants with dismissive (i.e. *avoidant attachment*; high avoidance, low anxiety), fearful (high avoidance, high anxiety), and secure (low avoidance, low anxiety) attachment styles.

Lastly, the researchers (Cyr et al., 2015) conducted a multiple regression analysis with gender and grade entered on step 1, psychological variables entered on step 2, and CT Time and CT Preference entered on step 3, in order to determine if communication technology would predict psychological symptom severity beyond identity and relationship variables. The authors reported a statistically significant model fit ($R^2 = .43$, Adjusted $R^2 = .40, F [11, 226] = 15.47, p < .001$). Furthermore, the authors reported a statistically significant change in R^2 at step 3 (change in $F [2, 226] = 5.33, p = .005$; change in $R^2 = .03$) with standardized beta coefficients reaching significance for identity

distress ($\beta = .28, p < .001$), existential anxiety ($\beta = .23, p < .001$), relationship avoidance ($\beta = .22, p < .001$), relationship anxiety ($\beta = .19, p = .001$), and CT Time ($\beta = .19, p = .002$).

The results supported a relationship between increased communication technology use and experiences of identity distress and existential anxiety, and while the sample in this study did not experience problems in relationship development in relation to communication technology use, communication technology appeared to be related to decreased quality of adolescent peer relationships (Cyr et al., 2015). Furthermore, the researchers identified communication technology to predict psychological adjustment when controlling for identity and relationship variables. In combination, the results of this study “[...] support the notion that communication technology might be increasing psychological maladjustment in general, and specifically in regard to identity formation and relationship quality” (pp. 89-90). This study was completed with a sample of high school students who are not yet emerging adults, but the findings of this study compel researchers to question how emerging adults might reflect similar trends. However, this study was vulnerable to several limitations including the use of self-report measures without any triangulation of data, and the study was correlational in nature; thus, researchers are unable to establish causality in order to know if communication technology use precedes adolescent psychological adjustment problems or if adolescent psychological adjustment problems precede the use of communication technology.

Best, Manktelow, and Taylor (2014) conducted a meta-analysis ($k = 43$) on empirical research regarding SCT and adolescents’ wellbeing published between 2003

and 2013. Using a narrative synthesis methodology, the researchers searched eight bibliographic databases for studies related to “[...] the ‘influence of social networking sites on the mental wellbeing of adolescents’” (Best et al., 2014, p. 28). In their meta-analysis, the authors included any papers that focused on communicative social media technology with a mean sample age of 19 or less. The authors created a multi-dimensional framework of analysis involving theoretical models from the communication, sociology, and psychology fields and employed multi-level approaches (e.g., macro level per communication approaches, meso level per systems approaches, micro level per adolescent development approaches). The researchers reported that the majority of studies reviewed (95%) had mixed-gender samples, though many studies had a greater number of female to male participant ratios. The authors reported that 55% ($n = 32$) of the research reviewed employed a quantitative survey method, while 12% of studies were qualitative, 12% were longitudinal, 11% were content analyses, 4% were experimental, 3% were case control, and 3% were mixed methods. The researchers identified studies as falling into one of five categories: (a) intensity of online communicative practices, (b) preference for online communication, (c) online disclosure processes and motivations, (d) behavior changes through online communication, and (e) differences associated with online and offline communications. Ultimately, the authors identified a series of studies that reported a negative relationship between online communication practices and wellbeing ($n = 8$), but also a series of studies that reported positive relationships between online communication and wellbeing through increased social support, self-esteem, and possible mental health promotion benefits, and reduced

social anxiety and social isolation ($n = 9$). Similarly, the researchers identified one study in which instant messenger was linked with increased depression (see Van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008) and a second study that reported no relationship (see Jelenchick, Eickhoff, & Moreno, 2013).

In summary of their review, the authors (Best et al., 2014) reported inconsistency in study findings and that SCT used as a communicative tool provided more benefits to well-being than SCT not used for communication. The researchers reported that SCT used for communicative purposes simultaneously promoted adolescents' well-being while possibly also increasing exposure to harm. Therefore, the researchers recommended that future studies move away from examining the intensity of online use in minutes online or by quantity of online friends and instead explore specific online activities. However, it is necessary to note limitations to this study including the reliance on cross-sectional survey based research as opposed to experimental design research, and conclusions being limited by the quality of the studies included in the meta-analysis. Further, Best and colleagues did *not* report quantitative data on the specific studies used in their meta-analysis (e.g., demographic data, correlation coefficients, instrumentation, effect sizes), which consequently inhibits the strength of conclusions reported by the researchers. While this study did *not* examine samples of emerging adults exclusively, young emerging adults (18-19 year olds) were included in this study. It can be inferred from the results that studies examining the influence of SCT with samples of emerging adults should also explore specific activities. As it relates to the present study, the researcher investigated specific activities related to an individual's use of online dating

websites and telephone applications.

SCT has changed the landscape for how individuals form relationships and connect with one another. Researchers have identified that SCT is used to strengthen their relationships and communicate from afar. However, the concern amongst researchers is the distinction between using SCT as a tool to connect versus a preferred method of communication “[...] especially when this preference stems from a desire to avoid direct face to face social contact. Such avoidance might interfere with the development of appropriate social skills, with lack of practice increasing fears of social inadequacy which in turn increases avoidance, in a cyclical pattern” (Cyr et al., 2015, p. 82). In accordance with recommendations made by Best and colleagues (2014), this research investigation moved the literature forward by examining a specific use of SCT: Online dating. The following section delineates research associated with SCT and romantic relationships with samples of emerging adults.

Social Communication Technology and Emerging Adult Romantic Relationships

The Internet and technology can be used as a powerful tool in individuals’ lives, with researchers indicating both positive and negative associations with its use. However, couple therapists report working with clients with an increasing number of cases involving problems related to the Internet (Cooper & Griffin-Shelley, 2002), and marriage and family therapists have reported that they have not been trained by their program to deal with these kinds of problems (Goldberg, Peterson, Rosen, & Sara, 2008).

Craig, McInroy, McCready, Di Cesare, and Pettaway (2015) conducted a

grounded theory investigation into sexual minority emerging adults' ($N = 19$; 18-22 years old, $M = 19.46$, $SD = 1.22$) use of information and communication technologies to understand the types of technology used and the importance of its use. The sample consisted of individuals who identified as a sexual minority (e.g., lesbians [$n = 4$], gays [$n = 6$], bisexuals [$n = 2$], queers [$n = 1$], polysexuals [$n = 1$], and individuals with multiple identifications [$n = 5$]). The majority of participants identified as cisgender (79%), and three participants identified as transgendered men and one participant identified as genderqueer. Participants reported using a wide array of information and communication technology including computers, music devices, televisions, cell phones, smart phones, radios, gaming systems, e-readers, and/or tablets. The researchers reported two main themes resultant of the investigation relevant to this literature review. First, participants reported online experiences as feeling safer than being offline, in that participants were less likely to be bullied, and that online experiences were typically supportive. Second, participants reported that information and communication technology enabled them to build supportive relationships with other members of a sexual minority community to find support and resources. While this study was not without limitations (e.g., limited transferability, selection bias), it contributed to the literature by indicating that, despite some threats that exist in online activity, for individuals who fit outside of society's norms and might be vulnerable to bullying offline, information and communication technology might provide tools to build positive and healthy relationships.

To further review the influence of technology on relationships, Schade, Sandberg, Bean, Busby, and Coyne (2013) used exploratory path analysis with a sample of

emerging adults ($N = 276$; 18-25 years; [mean age for men = 23, $SD = 1.87$; mean age for women = 22, $SD = 1.97$]) and their partners in committed heterosexual relationships. Participants identified as being engaged or committed to being married (female $n = 64$, male $n = 64$), seriously dating (female $n = 52$, male $n = 52$), or married (female $n = 22$, male $n = 22$). Participants reported being in relationships for different lengths of time (0 to 3 months, female $n = 9$, male $n = 9$; 4 to 6 months, female $n = 17$, male $n = 13$; 7 to 12 months female $n = 24$, male $n = 25$; 1 to 2 years, female $n = 40$, male $n = 45$; 3 to 5 years, female $n = 38$, male $n = 35$; or 6 to 10 years, female $n = 10$, male $n = 11$). The majority of participants identified as Caucasian (Caucasian, female $n = 120$, male $n = 116$; African/Black, female $n = 5$, male $n = 9$; Latino, female $n = 3$, male $n = 5$; mixed or biracial, female $n = 5$, male $n = 5$; Native American, female $n = 2$, male $n = 2$; or Asian, female $n = 3$, male $n = 1$). Participants completed five assessments.

First, participants completed the *Relationship Evaluation Questionnaire* (RELATE; Busby, Holman, & Taniguchi, 2001). Second, participants completed a technology use questionnaire regarding frequency of use of two types of technology use (a) texting and (b) social networking sites on a 7-point Likert scale to address how frequently the technology was used to communicate with their partner, the purpose for technology use in the relationship (e.g., to discuss serious issues, to discuss a potentially confrontational subject, to apologize), frequency of use of technology to communicate in the relationship (e.g., texting, e-mail, instant messaging, blogs, mobile phones, social networking sites, or webcams), and how often technology was used to hurt their partner. The researchers reported Cronbach's α for men as .78 and for women as .82. Third,

participants completed the *Brief, Accessibility, Responsiveness, and Engagement* assessment (BARE; Sandberg, Busby, Johnson, & Yoshida, 2012) to measure attachment behaviors in couple relationships (men $\alpha = .76$; women $\alpha = .84$). Also, participants completed an unnamed researcher-created relationship satisfaction questionnaire using a 5-item Likert scale that assessed different facets of the relationship (men $\alpha = .82$; women $\alpha = .81$). The researchers reported previous test-retest reliability for the instrument at .78 (see Busby et al., 2001) and reported the assessment as being “highly correlated with existing relationship quality and satisfaction measures both in cross-sectional and longitudinal research” (p. 322; see Busby et al., 2001; Busby, Ivey, Harris, & Ates, 2007). Lastly, participants answered three questions related to relationship stability on a 5-point Likert scale. Researchers reported test-retest reliability values between .78 and .86 (see Busby et al., 2001, 2007; Busby & Gardner, 2008).

Schade and colleagues (2013) reported strong relationships between male and female frequency of texting ($r = .88$), frequency of use of social technology ($r = .75$), and relationship stability scores ($r = .73$). Additionally, the authors reported relationship satisfaction scores at .57 and attachment and relationship satisfaction scores for men ($r = .59$) and women ($r = .72$). The authors reported male attachment was statistically significant ($p \leq .01$) and moderately correlated with relationship stability ($r = .40$) and female attachment ($r = .51$). The authors assessed relationships between (a) texting frequency to connect in the relationship, (b) use of social media to connect in the relationship, (c) use of technology to express affection in the relationship, (d) use of technology to discuss serious issues, and (e) use of technology to hurt one’s partner with

the constructs of relationship satisfaction and relationship stability, with partner attachment as a possible mediating variable. The authors reported that the model fit the data: $X^2(35) = 43.4, p = .157$, Tucker Lewis index (TLI) = .97, comparative fit index (CFI) = .991, and root mean square error of approximation (RMSEA) = .042. Regarding factor effects, the researchers reported that partner attachment was associated ($p \leq .001$) with relationship satisfaction for men ($\beta = .45$) and women ($\beta = .56$), and partner attachment was also positively associated with relationship stability for both men ($\beta = .18, p = .04$) and women ($\beta = .36, p \leq .001$).

Regarding texting, frequency of female texting was positively associated with relationship stability ($\beta = .34, p = .02$), while male texting frequency was negatively associated with relationship satisfaction ($\beta = -.27; p = .05$). In relation to technology use to express affection, male use was positively related to male relationship satisfaction ($\beta = .16, p = .02$) and their partner attachment ($\beta = .18, p = .02$). Similarly, female technology use to express affection was also positively related with their reported partner attachment ($\beta = .19, p = .04$). The authors further reported that females' technology use to regulate the relationship was negatively associated with their relationship satisfaction ($\beta = -.19, p = .001$). It is worth noting that no statistically significant female paths were identified for using technology to hurt one's partner. For men's use of technology to hurt their partner, negative associations were established with their own satisfaction ($\beta = -.20, p = .01$), stability ($\beta = -.35, p \leq .001$), and reported partner attachment ($\beta = -.42, p \leq .001$).

Regarding partner effects, researchers identified positive correlations for male report of partner attachment and female relationship satisfaction ($\beta = .13, p = .04$) and

positive correlations between female report of partner attachment and both male relationship satisfaction ($\beta = .15, p = .03$) and male relationship stability ($\beta = .21, p = .01$). The researchers reported that males' frequency of texting was negatively associated with female relationship satisfaction ($\beta = -.27, p = .01$) and with female relationship stability ($\beta = -.42, p = .003$). However, the researchers did *not* identify statistically significant effects from female texting to their male partner variables. The authors reported that male use of technology to express affection was positively related to female report of partner attachment ($\beta = .18, p = .03$), but no statistically significant associations were established from female technology use to express affection to male report of partner attachment. Male use of technology to hurt one's partner was negatively associated with female relationship satisfaction ($\beta = -.15, p = .01$) and female relationship stability ($\beta = -.27, p \leq .001$), whereas female use of technology to hurt partners was negatively associated with male report of partner attachment ($\beta = -.18, p = .02$). The researchers conducted a Sobel test for mediating effects of female or male reported attachment. The researchers identified male report of partner attachment mediated technology use to hurt a partner and self-reported relationship satisfaction ($p = .02$). Further, male report of partner attachment mediated males' use of technology to express affection and female relationship satisfaction ($p = .02$).

Using attachment theory as markers for romantic relationship quality, Schade and colleagues (2013) concluded from their study that relationship attachment is an important indicator for relationship satisfaction and stability, and it may mediate negative relationship effects (e.g., using technology to hurt one's partner). It is also noteworthy

that social technology use was *not* statistically significantly associated with relationship quality, but technology could be used to either support the relationship (e.g., using texting to express affection) or harm the relationship (e.g., using texting to hurt one's partner). The results from this study further support that partner attachment is strongly related to the success of a relationship in terms of relationship quality and stability. The researchers also noted that males' texting might be driven by feeling the relationship is threatened, which would explain the negative relationship between male texting and global relationship satisfaction and females' relationship stability, which contradicts females' texting frequency and feelings of relationship satisfaction. The authors recommended further exploration of gender differences related to texting and further exploration of relationship regulation in relation to technology use as "attempts to regulate relationships through this new use of social technology may be confounded by the uncertainty inherent in this population" (pp. 331-332). The authors noted that attachment might mediate the effects of negative communication, but cautioned that emerging adult partners might not be aware of the strong negative affect of using technology to hurt one another. The findings of this study are vulnerable to several limitations, including demographic variables (e.g., largely Caucasian sample with post-secondary education). Additionally, constructs like texting, expressing affection, and hurtful communication were measured with only a single item, which harms potential validity and reliability. Also, as is the nature of correlational research, causation cannot be established.

In total, a brief review of the literature identifies significant relationships between SCT use and emerging adult relationships. However, research regarding SCT on

emerging adult relationships is still unfolding, and researchers have reported conflicted conclusions about the positive and negative influence of SCT. Regardless of the population studied, the constructs of interest, or the timing of when research was conducted in the history of the development and use of SCT, definitive conclusions have *not* been established. Thus, more recently, researchers have argued for a movement in empirical research from general SCT use towards an examination of specific online activities “[...] rather than variables such as the ‘amount of time’ or ‘number of online friends’” (Best et al., 2014, p. 34). One of the lesser studied constructs of SCT is that of online dating. Therefore, the focus of this research investigation is the influence of online dating on emerging adults, especially as it relates to relationship quality with romantic partners and mediating variables (e.g., empathy, objectification of others). The following section reviews the literature regarding online dating.

Online Dating

Online dating is a vehicle for relationship initiation that then progresses to face-to-face relationships (Sprecher, 2009). Some researchers have theorized that online dating might be a tool to form relationships specifically for individuals with high anxiety, but researchers found evidence to contest this theory (Stevens & Morris, 2007). Rather, individuals from emerging adulthood through older adulthood use online dating services to establish relationships (Alterovitz, & Mendelsohn, 2011; McWilliams & Barrett, 2014), and not necessarily to compensate for anxiety (Sprecher, 2009). However, researchers criticized online dating as a medium social interaction and communication

because its use bypasses essential face-to-face experiences that researchers argue are necessary for relationship development (e.g., nonverbal cues, physical proximity, physical attraction; Riva, 2002); yet, online relationships and online dating are widespread and prevalent in American society across demographic variables (Smith & Duggan, 2013).

Pew Research Center (Smith & Duggan, 2013) conducted a survey in the spring of 2013 with a sample of American adults aged 18 or older ($N = 2,252$) and reported on the current state of online dating. Researchers reported that 11% of Internet users (9% of adults) have personally used an online dating website (e.g., Match.com, eHarmony, OK Cupid) and 7% of cell phone application users (3% of adults, 5% of 18-24 year olds, $n = 243$) have used a dating application (e.g., A, b, c) on their cell phone, resulting in 11% of all American adults having used at least one of the two methods of online dating. As such, researchers termed this population of users of websites or phone applications designed for online dating as “online daters.”

Smith and Duggan (2013) noted that 38% of single Americans have used online dating to find a partner and 66% of online daters have gone on a date with a person met through a dating website or application. The prevalence of online dating has increased throughout the last decade so that 42% of Americans know an online dater, and 29% of Americans know someone who has found a spouse or long-term partner through online dating. The researchers reported that, compared to data from a survey in 2005 ($N = 3,215$), Americans’ belief that online dating is a good way to meet people is increasing (59% compared to 44%), as is the belief that online dating allows people to find a better

match (53% compared to 47%), and beliefs stigmatizing online dating are diminishing (e.g., *people who use online dating are desperate*, 21% compared to 29%).

Despite Americans' positive attitudes towards online dating, it is also worth noting that 32% of Americans believe *online dating keeps people from settling down* (Smith & Duggan, 2013). Further, 54% of online daters have encountered profiles that misrepresent the online dater, and 28% of online daters reported having been made uncomfortable or felt harassed by another online dater (42% of females, 17% of males). Nonetheless, 5% of Americans currently married or in a long-term relationship met their partner online (8% of 18-29 year olds, $n = 243$), and 11% of Americans, those who have been partnered for ten years or less, met online. Generally, data collected from the Smith and Duggan survey, compared with data from 2005, shows behavior and attitudes trending towards increased online dating activity and influence in American lives.

Even though online dating is prevalent and used amongst American individuals, research on online dating is still in its infancy – partly due to its novelty. For example, a study conducted by McKenna, Green, and Gleason in 2002 with a sample of 567 individuals ($M = 32$ years old) identified that participants had only been using the Internet for an average of 34 months at the time of the survey (ranging from 1 to 243 months). In its short existence, research efforts have generally focused on the use of deception in online dating (Hall, Park, Song, & Cody, 2010) – such as misrepresentation of photographs and profiles – and the evaluation of authenticity of the user and that information (Lo, Hsieh, & Chiu, 2013). Similarly, researchers identified that online daters may change their self-reported personality characteristics and appearance when they

anticipate meeting a potential date, and that online dating specifically “[...] may exacerbate people’s tendency to engage in deceptive self-presentation” (Guadagno, Okdie, & Kruse, 2012, p. 647). Some researchers have reported on risks identified by online daters (e.g., deceitfulness [false identities], sexual risks [pregnancy, sexually transmitted infections], emotional risks [online bullying], and physical risks [sexual violence]; Couch, Liamputtong, & Pitts, 2012). However, overall, researchers concluded that online dating and traditional dating share many qualities, with evidence that online daters place greater importance on attractiveness and communication style (Rosen, Cheever, Cummings, & Felt, 2008). Therefore, the following section will provide a brief review of the literature related to online dating.

Online dating research. Blackhart, Fitzpatrick, and Williamson (2014) examined the Big-Five personality traits, self-esteem, rejection sensitivity, and attachment styles on the use of online dating services with a sample of adults who were single or who were currently in a relationship for less than a year ($N = 725$; 18-71 years old, $M = 22.31$, $SD = 6.75$, 73.9% female, 91.6% heterosexual, 86.6% White/Caucasian). Participants completed a battery of empirically sound instruments to assess participants’ various dispositional factors. The researchers conducted a regression analysis and identified statistical significance ($F(9, 715) = 5.09, p < .01$). The researchers reported that rejection sensitivity was the only statistically significant predictor of online dating website use ($\beta = .14, t = 3.05, p < .01$), where participants with greater levels of rejection sensitivity used online dating websites more than those who were lower in rejection sensitivity. The researchers also examined whether rejection sensitivity, preoccupied attachment, self-

esteem, agreeableness, conscientiousness, and gender would predict the amount of time spent communicating online prior to meeting face to face. The researchers reported that the overall regression was statistically significant ($F [6, 718] = 4.62, p < .001$), but that *no* individual variable reached statistical significance. The results of this study support other findings that indicate very few qualities that distinguish online daters from non-online daters, with the results of this study indicating that only rejection sensitivity predicted online dating behavior. Findings from this study can be used to suggest that individuals who engage in online dating might find it *less* risky to try to meet potential dates through the added buffer of the Internet, and perhaps more sensitive in general. However, it is necessary to note the limitations of this study including the self-report nature of the assessments used and that the nature of correlational research lacks the ability to establish causation.

Kim, Kwon and Lee (2009) used data from the 2004 DDB *Needham life Style Survey* ($N = 3,345$; 1,757 female, $M = 48$ years old) to examine three consumer characteristics of online daters: self-esteem, involvement in romantic relationships, and sociability. Five items measured self-esteem “which conceptually reflected Rosenberg’s self-esteem measure” (p. 447). The researchers measured involvement in romantic relationships by three items ($\alpha = 0.61$) to determine how much a participant valued participation in a romantic relationship. Four items measured sociability, and one item measured the use of Internet dating services on a 7-point Likert scale ranging from “never in the past year” to “52+ times in the past year.” The researchers identified a statistically significant interaction effect between self-esteem and romantic relationship involvement

using Internet dating services ($F [1, 2838] = 6.65, p < .05$). However, when romantic relationships were valued, the effect of self-esteem on Internet dating services was statistically non-significant $p > .05$. Participants who considered romantic relationships less important, individuals with low-self-esteem ($M = 1.13$) were more likely to use Internet services than individuals with high self-esteem ($[M = 1.05], F [1, 2955] = 4.71, p < .05$).

Kim and colleagues (2009) identified a statistically significant three-way interaction effect between self-esteem, involvement in romantic relationships, and sociability ($F [1, 2838] = 6.63, p < .05$). The researchers reported that highly sociable participants with high self-esteem ($M = 1.19$) used Internet dating services more often than individuals with low self-esteem ($M = 1.09$) when romantic relationships were deemed important ($F [1, 2838] = 3.75, p = 0.05$). However, when relationships were not important to participants, individuals with low self-esteem were more likely to use dating services ($M = 1.17$) than those with high self-esteem ($[M = 1.05], F [1, 2838] = 7.42, p < .05$).

While Kim and colleagues' (2009) examined some of the characteristics of online daters (e.g., sociable individuals with high self-esteem interested in romantic relationships, less sociable people with low self-esteem when not interested in romantic relationships), several limitations existed for this study. First, the results of this study were dependent upon flawed instruments with little to no psychometric validation; and secondly, the data from this study was collected in 2004, which may no longer be relevant to the population of present-day online daters.

Rosen, Cheever, Cummings, and Felt (2008) conducted a series of studies comparing online daters to traditional daters. In one study with a sample of junior and senior level college students (18-25 years old, 65%) in the Los Angeles area ($N = 1,379$) of online daters ($n = 417$) and traditional daters ($n = 962$), participants rated 21 qualities in a potential date on a 4-point Likert scale ranging from very important to very unimportant. Sixty percent of participants reported that a user's picture was one of three most important parts of a profile, as was age (61%), and weight/body type (32%). Similarly, an additional study completed by the same researchers with a sample of 759 current (48%) and former (52%) online daters from the Los Angeles area (18-25 years old, 55%) further identified the importance of appearance (Rosen et al., 2008). Researchers reported that 52% of online daters would *not* contact a potential partner *without* a photograph. Further, 17% of respondents said they would be willing to contact a potential partner only after first asking for a photograph, and another 22% said they would ask for a photograph after exchanging a few e-mails. Participants in this study agreed that having multiple photographs of a person was very important (30%) or somewhat important (41%), and 32% of participants chose to not pursue a second date with a partner specifically because (s)he did not match his or her picture. The findings of these studies support the notion that online daters place great emphasis on physical appearance and "looks" of potential partners. However, it is necessary to note that the participants for these studies came from a specific region (e.g., Los Angeles), and the sample does not heterogeneously represent emerging adults.

Hitsch, Hortacsu, and Ariely (2006) examined the website activities of users of a

major online dating service ($N = 21,745$, 55% male) for a period of about three and a half months in 2003. The researchers described the process of joining an online dating service through profile creation (i.e., webpage). To create a profile, users identify demographic and socioeconomic information (e.g., race, income, religion), physical characteristics (e.g., age, height, weight, eye color, hair color), responses to open-ended essay prompts, and choose whether or not to upload a picture. Users of the services then contacted potential dates by email through the website. The majority of users were “hoping to start a long term relationship” (39% female, 36% male), “just looking/curious” (27% female, 26% male), or “seeking an occasional lover/causal relationship” (14% male, 4% female). The researchers reported that about two-thirds of the users had never been married; and the majority of users from the study were between the ages of 18-25 (52%).

Hitsch and colleagues (2006) recruited 100 graduate and undergraduate participants (aged 18-25) to rate the attractiveness of profile pictures (400 male, 400 female) on a Likert scale from 1 to 10. The researchers identified a Cronbach’s alpha 0.80 across 12 ratings per photo. The researchers standardized each photo rating by (a) subtracting the mean rating given by the participants, (b) dividing it by the standard deviation of the participants’ ratings, and (c) averaging the standardized rating across participants’ ratings of the particular photo. For members who did *not* post a photo to their profile, self-report ratings of their self-descriptions (e.g., “average looks”) were used in conjunction with the participant rated photographs to classify ratings into deciles, with the top decile split a second time into two halves; the researchers performed this process separately for males and females. The researchers did not report the full regression results

from their study; however, they reported that a user's "looks" explained the greatest amount of variance accounted for in whether or not females (30% of the variance accounted for) or males (18% of the variance accounted for) received contact emails from individuals viewing their profile. The researchers reported that men and women in the fourth decile (i.e., highest ranked category by looks) received about twice as many emails. Further, the researchers reported that women received *at least* twice as many e-mails, and men receive *at least* 60% more emails, when they posted pictures to their profile, compared to users without pictures who describe themselves as having "average looks." The researchers also gave examples of the importance of physical characteristics like height and weight, describing that men between 6'3 and 6'4 received about 65% more first-contact e-mails than men between 5'7 and 5'8. Similarly, researchers reported that the average woman at 6'3 received 42% fewer e-mails than women who were an average height of 5'5. In terms of the body mass index (BMI), researchers found that women with a physically unhealthy BMI of 17 received 90% more first-contact e-mails than a woman with a healthy BMI of 25. The researchers also reported that physical features such as hair color and hairstyle had an effect on first-contact emails received. For example, men with long curly hair received 18% less first-contact emails than men with medium straight hair.

The findings lend support to the theory that online dating creates an environment of both self-objectification and objectification of others, in which the evaluation of the physical features of one's self and others holds greater importance than personality characteristics (Hitsch et al., 2006). However, it is necessary to note that the data from

this survey came from two main geographical locations (e.g., San Diego, Boston), and data was collected from 2003, which may no longer be an accurate reflection of the online dating environment. Further, researchers failed to report the specific statistical results of their regression analysis, making it difficult for readers to evaluate their outcomes.

In continuation of the evaluative nature of online dating, Sritharan, Heilpern, Wilbur, and Gawronski (2009) investigated impression formation in online dating with a sample of 100 heterosexual female college students between the ages of 17 and 22 ($M = 18.48$, $SD = 0.85$). Researchers randomly assigned participants to one of two conditions in a 2 x 2 between-subjects experiment. Researchers used four hypothetical online dating profiles featuring a male online dater pursuing a female partner. The researchers identified the profile's demographic information and various physical and behavioral traits (e.g., height, weight, non-smoking), selected the profile's photograph as either a "highly attractive" or "highly unattractive," and altered the ambition of the profile by detailing the profile as invested in his education or not. Participants completed a five-item likeability questionnaire on a 7-Point Likert scale ranging from "not at all" to "very much" in relation to how interested they would be to go on a date or socialize with the individual characterized in the experimental profile. Participants completed a deliberate evaluation and a spontaneous evaluation (Affect Misattribution Procedure; see Payne, Cheng, Govorun, & Stewart, 2005). Researchers counterbalanced the order in which participants completed the evaluations.

Sritharan and colleagues (2009) used a factorial ANOVA (2 attractiveness x 2

ambition) procedure to examine spontaneous evaluations and identified a statistically significant main effect of attractiveness ($F [1, 96] = 77.40, p < .001, n^2 = .446$), thus providing evidence that participants showed favorable responses towards the profile when paired with an attractive photograph. The researchers reported that no other main or interaction effects reached significance (all F s < 1.07). To score deliberate evaluations, researchers averaged participants' item ratings on the likeability questionnaire ($\alpha = 0.89$). Using a factorial ANOVA (2 attractiveness x 2 ambition), the researchers identified a statistically significant main effect of ambition, with more favorable evaluations of the ambitious profile than the unambitious profile ($F [1, 96] = 5.28, p = .02, n^2 = .052$). Further, the researchers identified that attractiveness was a statistically significant main effect with participants reporting more favorable evaluations of the profile with the attractive photograph rather than the unattractive photograph ($F [1, 96] = 17.39, p < .001, n^2 = .153$). An additional factorial ANOVA (2 attractiveness [high vs. low] x 2 ambition [consistent vs. inconsistent with attractiveness]) identified a statistically significant two-way interaction ($F [1, 96] = 5.28, p = .02, n^2 = .052$), identifying a statistically significant effect of attractiveness when consistent with ambition ($F [1, 47] = 21.66, p < .001, n^2 = .315$), but not when the two kinds of information were inconsistent ($F [1, 49] = 1.70, p = .20, n^2 = .034$).

Sritharan and colleagues (2009) argued that spontaneous evaluations supported deliberate evaluations when information was consistent and identified evidence for this conclusion with spontaneous evaluations being positively related to deliberate evaluations when the information was consistent ($r = .45, p = .001$). Though, spontaneous

and deliberate evaluations were not correlated when the information was inconsistent ($r = .04, p = .77$). The researchers concluded that when attractiveness-related, spontaneous response was consistent, facial attractiveness was a primary determinant of spontaneous evaluations. Further, self-described ambition only influenced deliberate evaluations, which were also affected by attractiveness. The researchers reported that individuals with attractive profile photos might elicit positive affective responses in potential online daters, which might only be discounted after deliberate evaluation if the attractiveness of the profile picture is inconsistent with other perceived negative information (e.g., low ambition). Similarly, the researchers reported that individuals with unattractive profile photos might stimulate less favorable affective responses in potential online daters, though the initial less favorable response may be accounted for by a deliberate evaluation of the profile if the individual has positively perceived information (e.g., high ambition).

Recognizing a main limitation of the study – that an individual’s facial attractiveness might have been the first information processed by participants – the Sritharan and colleagues (2009) conducted a similar second experiment with 80 heterosexual female college students ($M = 18.60$ years old, $SD = 2.28$, age range of 17-33 years). In this second experiment, instead of participants receiving the profile picture *and* the profile information simultaneously, participants received the picture and information sequentially, with half of the participants receiving the picture first and the other half of participants receiving the description first. Overall, the researchers reported a replication of findings from the first experiment, indicating spontaneous evaluations being affected *only* by photograph attractiveness ($F [1, 72] = 15.50, p < .001, \eta^2 = .18$) and deliberate

evaluations being influenced by both photograph attractiveness ($F [1, 72] = 26.41, p < .001, n^2 = .27$) and level of ambition ($F [1, 72] = 34.34, p < .001, n^2 = .32$). The results supported that facial attractiveness is likely an essential component of both spontaneous and deliberate evaluations of individuals viewing potential dating partners through an online dating service, regardless of the order in which profile pictures or information are received. However, it is necessary to note that participants in this study were mostly young (e.g., 18 or 19) and exclusively heterosexual females, making it difficult to hypothesize across potential online daters of varying sexual orientations, age, and sex.

Beyond increased reliance on attractiveness and the evaluation of potential partners' physical attributes, online dating allows for unique interactions between individuals because photographs are only visual cues and not actual physical representations of partners. McKenna and colleagues (2002) reviewed the literature on relationship development and cited the work of Gergen, Gergen, and Barton (1973) who identified "[...] when individuals interacted in a darkened room where they could not see one another, they not only engaged in greater self-disclosure but also left the encounter liking one another more" (p. 24). The authors used Gergen and colleagues' finding as a metaphor for relationships on the Internet in which – without audio/visual media – two individuals communicate without the influence of physical data (e.g., appearance, nonverbal cues) to prevent relationship gating. Therefore, McKenna and colleagues examined the effect of face-to-face interactions compared to chat room interactions on relationship gating features (e.g., physical appearance, nonverbal communication).

With a sample of 60 undergraduate students (50% female), participants were

randomly assigned to three conditions to engage in two 20-minute meetings (McKenna et al., 2002). In the control condition, each participant interacted with his or her partner face to face and by Internet chat room. In the second condition (i.e., Internet Chat Room [IRC]), participants interacted first by Internet chat room and then met face to face for the second meeting. In both of these conditions, participants were aware that they would be interacting with the same person on both occasions. In the third condition (i.e., trading places [TP]), participants interacted with one person in a face-to-face situation and then again over the Internet, though participants were led to believe it would be a different partner over the Internet. The researchers paired participants with opposite-sex partners resulting in 10 cross-sex pairs per condition. Participants completed a 14-item scale assessing participants' "liking" of their partner and completed eight items from the *Relationship Development Scale* (Parks & Floyd, 1995) to measure participants' perceptions about the quality of the interaction and the level of intimacy of the interaction. Neither the communication mode (e.g., face to face, Internet chat room) nor effect of time (e.g., first meeting, second meeting) were statistically significant ($F [1, 40] = 2.27, p = .12$; $F [1, 40] = 1.35, p = .25$); however, the interaction of communication and time was statistically significant ($F [1, 40] = 4.98, p < .05$). The researchers reported that the amount of liking for one's partner was statistically significant by the end of the interaction at Time 2, indicating that those interacting by chat room ($M = 4.70$) liked their partners more than individuals who met consistently face to face ($[M = 2.45], t [38] = -2.18, p < .05$).

McKenna and colleagues (2002) also conducted a within-participants *t*-test for

individuals in the IRC condition comparing participants' liking of one another at Time 1 (after IRC only) and Time 2 (face to face). The researchers identified a statistically significant increase from Time 1 to Time 2 ($t [20] = 1.83, p < .05$), one-tailed, while a within-participants t -test for the control group was statistically non-significant ($t [20] = 1.45, p > .10$). The results indicated that participants' liking of one another was enhanced when meeting face to face after first meeting by Internet chat room. Researchers also conducted a within-participants t -test to determine that the same person was liked more when interacting with a partner by Internet ($M = 4.95$) rather than by meeting face to face ($M = 3.11, t (20) = 3.33, p < .001$). Using a t -test to compare conversation quality ratings of the chat room partner and face-to-face partner in the trading places condition (the same participant, though participants believed their second partner to be a new partner), the authors reported that participants felt they knew their chat room partner better than their face-to-face partner ($t (18) = 3.64, p < .001$), and participants exhibited greater self-disclosure by reporting to their chat room partner what they liked about him or her, as opposed to doing the same with their face-to-face partner ($t (18) = 2.80, p < .01$).

In total, the findings (McKenna et al., 2002) supported the theory of the online disinhibition effect (Suler, 2010) as evidenced by participants' self-disclosure. Results from this study indicated that relationships can develop and grow with intimacy through online mediums. A foundational theoretical principal of this study was that online communication would negate the superficiality that is associated with face-to-face encounters; while this tenant may have been true at the time this study was conducted (i.e., 2002), there is some evidence that contemporary online dating promotes

superficiality beyond face-to-face encounters (Heino, Ellison, & Gibbs, 2010). McKenna and colleagues' (2002) work was vulnerable to several limitations including instrumentation error and relatively small sample sizes. However, the results indicated that online dating might promote a fantasy-like projection onto online potential partners. In light of objectification theory, the author argues that online dating is an environment that promotes superficiality and the objectification of others by their physical traits and further evaluation when potential partners do not live up to one's projected fantasy.

Arvidsson (2006) argued that the format of online dating encourages fantasy by asking the user to "fill in the blanks" (p. 679) about a potential partner. Paired with the superficiality promoted by online dating - the emphasis on the looks of a potential partner (Hitsch et al., 2006) – there is limited room for a solicited partner to *be* him or herself. Rather, she or he is obligated to fill the fantastical image created by the viewer. In line with this theory, Ramirez, Sumner, Fleuriet, and Cole (2015) examined how online daters ($N = 433$, 265 female, $M = 39.77$ years old, $SD = 11.49$) switched modalities from online communication to face to face communication and identified that the amount of time partners spent online prior to meeting face to face shared a curvilinear, inverted U-shaped relationship with perceived outcome value of the relationship ($\beta = -.23$, $p < .01$). The researchers identified that the amount of time spent communicating online prior to face to face meeting accounted for 4% of the variance in perceived outcome value of the relationship (R^2 -change = .04, F -change (1, 427) = 8.23, $p < .01$).

In relation to the fantasy-projection of the online partner, Ramirez and colleagues (2015) reported that online partners create mental constructs of potential partners through

the reading and interacting with an online profile, consequently “Daters who wait too long to meet in person, and therefore cross this tipping point, might find it difficult to accept any discrepancies from their idealized mental construct of their partner” (p. 110). However, it is necessary to note the limitations of this study, which asked participants to call upon previous experiences, thus possibly traducing memory bias and the over-emphasizing previous positive or negative experiences. While only a small effect size (4%) was observed, this study provided support for the existence of discrepancies between online daters’ perception of an individual’s online persona (fantasy projection) and experience of an individual’s real life personality, which might be heightened by the evaluative (i.e., objectification) process promoted by online dating.

In line with the objectifying nature of online dating, Heino and colleagues (2010) explored the experiences of online daters ($N = 34$; 50% female) using a marketing metaphor to examine participants’ self-concept and interactions with potential partners through semi-structured interviews. The researchers reported on the history of the use of marketing metaphors to describe relationship development and mate selection (see Arvidsson, 2006; Becker, 1973; Roloff, 1981) and referred to online dating websites as “[...] a place where people go to ‘shop’ for potential romantic partners and to ‘sell’ themselves in hopes of creating a romantic relationship” (Heino et al., 2010, p. 429). Participants were recruited from a large online dating service where users create profiles, view others’ profiles, and communicate through a double-blind e-mail system. In contrast to the study conducted by McKenna and colleagues (2002), participants had access to multiple photographs and written descriptions to convey themselves, as well as their ideal

partner, in addition to responses to closed-ended questions regarding descriptors including height, salary, religion, marital status, and alcohol use. Participants in this study ranged in age from 25 to 70 years ($M = 42$, $SD = 9.35$), and had been active in online dating for 1 month to 5 years ($M = 28$ months, $SD = 17.96$).

After completing semi-structured interviews with participants, the Heino and colleagues (2010) employed a four step data analysis process: (a) open coding, (b) coding the data again, (c) identifying participant strategies influenced by the market metaphor, and (d) grouping strategies into five broader themes, higher abstraction categories, or codes. The researchers identified five main themes: (a) assessing others' market worth, (b) determining one's own market worth, (c) shopping for perfect parts, (d) maximizing inventory, and (e) calibrating selectivity. Participants compared their profiles to that of a résumé, and reported on strategies of presenting one's self as more attractive (e.g., males exaggerated height, females diminished weight) while taking into account others' over-emphasizing of positive characteristics. Participants reported that to compensate for others' deception, they would avoid profiles that lacked photos or multiple photos, or profiles that used only one blurry photo. Several participants reported the experience of online dating being good for their self-esteem with one participant stating (in response to the number of e-mails she received), "I'm much more attractive than I had thought" (p. 436). For some participants, they learned that they were less "marketable" compared to others and had to lower their expectations as to the caliber of potential mate they might meet. Other participants reported that, despite some of the positive qualities of online dating – such as the convenience of online dating and the filtered availability of so many

potential partners – online dating encouraged “quick decision making on surface-level characteristics” (p. 440).

It is worthy to note that this study (Heino et al., 2010), conducted eight years after McKenna and colleagues’ (2002) study, exemplifies the evolution of online dating and online attraction through the necessity of online media (i.e., pictures) to associate with a potential partner. Further, experiences of this study also exemplified the objectifying nature of online dating through the use of media and superficial qualifiers (e.g., salary, height) to find potential partners. However, it is also worthy to note that this study was *not* conducted with emerging adults, and that the findings of this study may be unique to the one online dating site participants from which the participants were recruited. Nonetheless, the results of this study highlight the “[...] commodification of relationships and people, which devalues the uniqueness of individual actors” (p. 444), potentially contributing to the objectification of others. Therefore, the authors made recommendations for online dating sites which translates to recommendations for counselors and counselor educators as well: help users succeed in online dating by counseling them how to write profiles, initiate, and nurture relationships.

In combination, survey reports consistently indicate intensive use of technology to participate in online relationships and to support existing face-to-face relationships. Researchers reported mixed findings on the influence of SCT on relationships and encouraged the investigation of more specific online activities. Online dating is one specific online activity that is widespread and prevalent in North American culture. While some emerging adults have successfully connected to others and established

relationships through the use of online dating, the concern amongst researchers is that online dating promotes an environment of objectification of others based on physical attributes and denial of one's personhood, which theoretically inhibits empathic development – the key component for healthy romantic relationships (Szalavitz & Perry, 2010). In light of researchers' recommendations, the focus of this research investigation is to examine the specific online activity of dating on its influence of emerging adults' quality of romantic relationships and an examination of empathy and objectification of others as mediating variables.

Summary

Interpersonal relationships are important at every point in an individual's life (Bowlby, 1969; 1973; 1980). Evolutionarily, human beings have survived as a result of their ability to establish strong relationships, founded in the ability to empathetically connect with others (Szalavitz & Perry, 2010). However, for the first time in the history of the world, technological advances have provided a new foundation for people to connect to one another by using a digital vehicle that bypasses nonverbal communication – a fundamental piece of developing and sustaining empathy (Siegel, 2010). While SCT has been studied in the literature, research regarding online dating is still developing – especially regarding its association with emerging adults and their relationships. Therefore, it is necessary to examine the directional relationships between emerging adults' use of online dating and their levels of empathy and objectification of others in contribution to their quality of relationships with romantic partners. Specifically, this

study examined the hypothesized model that greater use of online dating services (as measured by the *Online Dating Intensity Scale*) will contribute to decreased levels of empathy (as measured by the *Adolescent Measure of Empathy and Sympathy* [Vossen et al., 2015]), increased levels of objectification of others (as measured by the *Sexual-Other Objectification Scale*) and decreased quality of relationships with romantic partners (as measured by the *Relationship Structure Questionnaire of the Experiences in Close Relationships Scale* [Fraley et al., 2011] and the *Relationship Assessment Scale* (Hendrick, 1988)).

CHAPTER THREE: METHODOLOGY

In chapter three, the author reviews the research design, methods, and procedures of this investigation. The purpose of this research study was to investigate the directional relationship between emerging adults' use of online dating and their levels of empathy, objectification of others, and quality of relationships with romantic partners. This researcher tested the theoretical model that emerging adults' intensity of online dating (as measured by the *Online Dating Intensity Scale* [ODI]) contributed to their levels of empathy (as measured by the *Adolescent Measure of Empathy and Sympathy* [AMES; Vossen, Piotrowski, & Valkenburg, 2015]), objectification of others (as measured by the *Sexual-Other Objectification Scale* [SOOS]), and quality of relationships with romantic partners (as measured by the *Relationships Structure Questionnaire* [ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011] and *Relationship Assessment Scale* [RAS; Hendrick, 1988]). Specifically, the study examined the hypothesized directional relationship that emerging adults' greater intensity of using online dating services (e.g., websites, applications) would have decreased levels of empathy, increased levels of objectification of others, and decreased quality of relationships with romantic partners. Additionally, this study investigated the relationship between emerging adults' demographic variables (e.g., age, gender, ethnicity, etc.) and the intensity of their use of online dating services, levels of empathy and objectification of others, and relationship quality with romantic partners.

The researcher used a correlational research design (Gall, Gall, & Borg, 2007) to examine the research hypothesis and exploratory questions. The researcher employed a

correlational design in order to determine directional relationships between emerging adults' online dating, levels of empathy, objectification of others, and relationship quality with romantic partners without any manipulation (Fraenkel, Wallen, & Hyun, 2011). This chapter delineates the following components of this research study: (a) population and sampling procedures, (b) data collection methods, (c) measurement and instrumentation, (d) research design and method, (e) research hypothesis and questions, (f) data analysis methodology, (g) ethical considerations, and (h) study limitations.

Population and Sampling Procedures

This study investigated the directional relationship between online dating and levels of empathy, objectification of others, and quality of relationships with romantic partners with a target population of emerging adults. For this study, emerging adults were defined as 18-29 year old undergraduate or master's level college students in the United States. Emerging adults are a unique counseling population due to their social roles and obligations in the context of today's society (Arnett, 2000; 2004; Arnett & Tanner, 2006; Tanner, Arnett & Leis, 2009; Tao, 2013). The researcher identified limited published research that examined emerging adults' utilization of online dating services (e.g., websites, applications) and its association with emerging adults' levels of empathy, objectification of others, and quality of relationships with romantic partners is sparse.

Sample Size

As of the year 2013, there were approximately 13,078,512 emerging adult college students between the ages of 18 and 29 years in the United States (U.S. Department of Education Institute of Education Sciences National Center for Education Statistics, 2014). An appropriate sample size in quantitative analysis is important to determine prior to data collection in order to account for population representation and statistical power (Gall et al., 2007) and to account for participant response rates (Shih & Fan, 2009). Beginning with population representation, larger sample sizes increase generalizability of the target population (Gall et al., 2007).

The researcher utilized Structural Equation Modeling (SEM; Tabachnick & Fidell, 2013) to examine the theoretical model that emerging adults' use of online dating services influences their levels of empathy, objectification of others, and quality of relationships with their romantic partners. The researcher calculated a power analysis in order to avoid making a Type II error (i.e., failing to reject a false null hypothesis; Balkin & Sheperis, 2011). While *no* single agreed upon best practices have been established regarding minimum sample size necessary for SEM (Quintana & Maxwell, 1999; Raykov & Marcoulides, 2006); however, Kline (2011) recommended a minimum sample size of *at least* 200 participants for SEM. Similarly, Schumaker and Lomax (2010) identified that most SEM published research articles use between 250 and 500 subjects and recommended, along with other researchers (e.g., Quintana & Maxwell), to recruit as large of a sample size as possible. Schumaker and Lomax (2010) recommended using www.Danielsoper.com (sample size calculator) to calculate *a priori* sample size for SEM.

Based on this website, a minimum sample size of 387 was required to identify a small effect size (0.1) at a high power (.8) with four latent variables and 11 manifest variables at the probability of $p < .05$. The researcher elected to use a probability value of $p < .05$ because only a subsample of the data ($n = 503$) reported that they had used online dating services. A sample size of 640 would be needed with the same variables to increase the probability level to .01. Therefore, based on SEM sample size best practices (e.g., Quintana & Maxwell; Raykov & Marcoulides, 2006; Schumaker & Lomax, 2010), the researcher deemed a minimum sample size of 500 completed data packets sufficient for this SEM research investigation to identify a small affect size at a high power statistical power. Participant recruitment resulted in a final, usable sample size of 1,613.

Sampling Procedure

Emerging adults were identified as the population of interest in this investigation. The identified population for this study included *all* emerging adult undergraduate or master's students between the ages of 18 and 29 enrolled at a college or university in the United States regardless of gender, race or ethnicity, or any other demographic variable. Samples are measured in order to make generalizations about populations (Tabachnick & Fidell, 2013). When the entire population is *not* available for sampling, convenience sampling is pragmatic and satisfactory (Gall et al., 2007). Therefore, the researcher invited a convenience sample of emerging adults enrolled in various colleges and universities to participate in this study through personal and professional contacts of the primary researcher, including students from (a) East Carolina University, (b) Florida Gulf

Coast University, (c) Georgia State University, (d) Rollins College, (e) Stetson University, (f) The University of Central Florida, (g) University of North Carolina at Charlotte, (h) University of San Diego, and (i) Valencia College. Utilizing a diverse sample from schools throughout the United States provided geographic representation.

The researcher anticipated and calculated non-response rates in order to achieve a minimum sample of over 500 completed data collection packets (Shih & Fan, 2009). In a meta-analysis of 49 Educational Psychology studies, Cook, Heath, and Thompson (2000) reported an average response rate of 35% for online survey research. Similarly, Pike (2008) reported an average response rate between 8% and 40% for web-based survey research conducted with college student samples. Due to the variance in participant response (Shih & Fan), and in order to be conservative in estimation, the researcher determined an anticipated response rate for online data collection at 10%. About 105 students received an invitation from their professor to participate in this research investigation, and the researcher anticipated a response of 10 participants from this form of online data collection.

The researcher also posted the research study on the University of Central Florida's Psychology department's SONA system. The researcher's UCF psychology department's faculty sponsor reported that the SONA system system hosts about 10,157 students and that the researcher could anticipate a response of 200-999 participants (personal communication with Dr. Jentsch, July 28, 2015). The researcher acquired a total 999 completed data packets from the UCF Psychology department's SONA system.

The researcher also utilized face-to-face data collection. For face-to-face data collection, the researcher anticipated response rates of 90% (Blount, 2015; Mullen, 2014). Therefore, in order to meet the minimum sample size of at least 500 completed data collection packets, the researcher invited 800 potential participants to complete face-to-face data packets for an anticipated response of 720 data packets from face-to-face data collection. All combined, the researcher anticipated a total response of about 930 completed data collection packets. However, the researcher received a total of 1,719 responses including 1,613 data packets that were determined to be complete and usable data. Thus, the researcher identified a useable response rate of 93.83%.

Data Collection

Prior to any recruitment of participants and data collection, the researcher received approval from the University of Central Florida's Institutional Review Board (IRB). The researcher submitted an application to IRB including (a) Human Research Protocol form, (b) a copy of informed consent, and (c) all measurement and assessment instruments including the demographic form. Additionally, the researcher procured permission to use the instruments chosen for distribution in this study. All of the instruments used in this study were made available for free online. Nonetheless, the researcher received approval from several of the authors of data collection instruments used in the study: (a) FBI (personal communication with Dr. Ellison, July, 10, 2015); (b) AMES (personal communication with Dr. Vossen, July, 10, 2015); (c) ECR-RS (personal communication with Dr. Fraley, July, 9, 2015) and (d) RAS (personal communication

with Dr. Hendrick, July, 26, 2015). Authors of these instruments also granted permission to alter their instrument in any way the researcher deemed necessary as well as to transfer the instruments to Qualtrics (www.qualtrics.com) for online survey distribution.

To reduce measurement error, physical data collection packets and the survey link were distributed to four dissertation committee members and six doctoral student colleagues prior to data collection to check the legibility and parsimony of the measurement instruments and the demographic forms (Dillman, Smyth, & Christian, 2009). The dissertation committee and doctoral student colleagues reported the amount of time required to complete the survey and additional feedback regarding the clarity of the survey. The researcher then implemented changes to the survey regarding this feedback (e.g., readability, instruction).

Data collection was initiated on September 3rd, 2015. The researcher collected data by (a) web-based survey and (b) face-to-face administration, following Dillman and colleagues' (2009) *Tailored Design Method* – a survey method designed to increase participant motivation to respond by establishing trust, increasing perceived benefits of participation, and decreasing the perceived cost of participation. To establish trust with potential participants, the researcher pursued endorsement for this research project through involved universities and faculty members. Further, the researcher assured potential participants of confidentiality and anonymity if choosing to participate in the study and provided participants information related to the purpose of the study (i.e., informed consent). To decrease potential participants' perceptions of cost, the researcher

made the survey convenient and accessible, avoided the use of technical language, and minimized solicitation of personal or private information (Dillman et al., 2009).

For web-based survey distribution, following Dillman and colleagues' (2009) *Tailored Design Method*, participants registered to UCF's Psychology department's SONA system could view the title of the research study and follow a unique access link leading to the Qualtrics survey including (a) informed consent; (b) general demographic form; and (c) assessment instruments (e.g., AMES [Vossen et al., 2015]; ODI; SOOS; ECR-RS [Fraley et al., 2011]; RAS [Hendrick, 1988] and MCSDS-FA [Reynolds, 1982]). The informed consent included a friendly tone and reminded potential participants of the importance of their participation and also included the researcher's contact information. Participants who completed data collection items received .50 SONA credits. Data collection closed on November 1, 2015, allowing for an eight-week window of opportunity for potential participants to participate in this research study, as recommended by the researcher's faculty supervisor from the University of Central Florida's psychology department (personal communication with Dr. Jentsch, July 27, 2015).

The researcher also collected data through face-to-face administration. First, the researcher received IRB approval from UCF and additional colleges and universities that requested IRB approval in order to be used as data collection points (e.g., East Carolina University). Next, face-to-face data collection began September 10, 2015 and was completed November 1, 2015, following a similar timeline as the online data collection period. The researcher scheduled dates with professors at various college and universities

to collect data through undergraduate and master's level classrooms. Colleges and universities chosen for data collection were based on location (e.g., size, demographic representation, and geographic location) in order to gain geographic representation.

In some instances, the course instructor shared a link to an online survey of the data collection packets to students where students could choose to participate in the research study. In other instances, the course instructor distributed data collection packets to students and returned the packets to the researcher. In order to account for duplications, the researcher selected classrooms for recruitment that were exclusive of one another. For example, the researcher invited students from an introductory course in counseling and elective courses that students enroll in later in their academic track. Or, the researcher recruited students from other colleges and universities with the understanding that students would not *also* be enrolled at UCF.

Potential participants had the option to not participate or to withdraw at any time from the study. Potential participants received an envelope without identifying information that included the general demographics form, the ODI, the AMES (Vossen et al., 2015), the SOOS, the ECR-RS (Fraley et al., 2011), the RAS (Hendrick, 1988) and the MCSDS-FA (Reynolds, 1982). Participants who chose to *not* participate returned an incomplete or blank envelope, whereas individuals who chose to participate completed the data collection packet in the envelope. The researcher assigned a number to completed data packets and entered the data into the SPSS. The researcher did *not* collect identifying information (e.g., name, student id). Having utilized both online web-based

survey and face-to-face administration, the researcher applied rigorous data collection procedures to ensure heterogeneity in the sample and geographic representation.

Instrumentation

The researcher utilized seven data collection instruments for this research investigation, including: (a) *general demographic form*, (b) The ODI, (c) AMES (Vossen et al., 2015), (d) SOOS, (e) ECR-RS (Fraley et al., 2011), (f) RAS (Hendrick, 1988), and (g) MCSDS-FA (Reynolds, 1982). The instruments used in this investigation were made available online, and the author received permission from several authors of the instruments (see appendices L, M, N, and O) to manipulate them and to use them electronically (e.g., www.qualtrics.com). The instruments (see appendices E, F, G, H, I, J, and K) were combined into a digital data collection packet and distributed to potential participants electronically. The following section introduces the six data collection instruments and reviews their psychometric properties with diverse samples.

General Demographic Questionnaire

The researcher utilized a general demographics questionnaire in this study to collect participant data related to various demographic variables (e.g., age, gender, and ethnicity). Specifically, this study collected data related to participants: (a) age, (b), gender, (c) ethnicity/race, (d) current year in college, (e) university of attendance, (f) major area of study, (g) sexual orientation, (i) relationship status, and (j) goal of a relationship (e.g., date, sexual encounter, short-term relationship, long-term relationship).

The researcher chose these demographic variables because they are commonly used demographic variables explored in similar research studies (e.g., Fox & Warber, 2013; Lee, 2013, Oldmeadow, Quinn, & Kowert, 2012).

Additionally, the general demographics questionnaire included items related to the quantity of online dating services used by an individual and asked participants to identify which online dating services they used. The general demographics questionnaire listed 16 possible services that were a combination of the most popular online dating services (e.g., eHarmony, OkCupid) and telephone applications (e.g., Tinder, Grindr) as of June and July of 2015 (Corpuz, 2015; “Top 15”, 2015). The researcher explored the psychometric properties of these items using the data from this study. Overall, a panel of experts (e.g., 10 dissertation committee and research colleagues) reviewed the general demographics questionnaire for readability and clarity.

Online Dating Intensity Scale (ODI)

The researcher conducted a thorough review of the literature investigating technology use and found a deficit of empirically validated instruments designed to measure this construct. The researcher contacted Dr. Richard Hartshorne – Associate Professor of Educational Technology and Program Coordinator for the Instructional Design and Technology department at the University of Central Florida (personal communication, April 26, 2015), who confirmed the limited existence of such instruments. Instead, the majority of researchers created their own instruments to measure technology use (e.g., Cyr, Berman & Smith, 2015; Ohannessian, 2009; Reich,

Subrahmanyam, & Espinoza, 2012). Blackhart and colleagues (2014) created an assessment called the Online Dating Inventory but reported several limitations to its viability including the assessment of intended behaviors rather than actual behaviors related to online dating. Overall, the lack of an established empirically supported instrument with strong psychometric properties used with consistency between studies impairs the ability to draw conclusions from research conducted (e.g., Short, Black, Smith, Wetterneck, & Wells, 2012), highlighting researchers' need for such an instrument.

In order to use a more empirically supported instrument rather than utilizing a researcher-created instrument with unexamined psychometric properties, the researcher reviewed the literature for instruments that measured similar constructs to intensity of online dating. The FBI (Ellison et al., 2007) is a one-factor self-report instrument consisting of nine items on a five-point Likert-scale ranging from *Strongly Disagree* to *Strongly Agree*, with a neutral “*Not Applicable*” option. The FBI was designed “[...] to obtain a better measure of Facebook usage than frequency or duration indices” (Ellison et al., 2007, p. 1150). Further, it was designed, “[...] to measure the extent to which the participant was actively engaged in Facebook activities [...] to tap the extent to which the participant was emotionally connected to Facebook and the extent to which Facebook was integrated into her daily activities” (Ellison et al., 2007, p. 1150).

Sherrell (2014) communicated with the author of the instrument (Dr. Ellison) and explained that the FBI is scored by calculating the mean of all of the items in the scale, resulting in one factor. Sherrell (2014) performed an exploratory factor analysis (EFA)

with a sample of undergraduate college students ($N = 717$), resulting in a two-factor solution (a) *Emotional Connectedness* ($\alpha = .89$, 47.04% of the variance explained), and (b) *Friends* ($\alpha = .77$, 14.71% of the variance explained) that explained 61.75% of the variance.

The researcher conducted a thorough search of EBSCOhost (i.e. PsycInfo, PsycArticles), and determined the FBI to be the most used assessment for social media usage. The FBI has been used in a series of studies with undergraduate college students with internal consistency scores ranging from $\alpha = 0.83$ ($N = 286$, Ellison et al., 2007) to $\alpha = 0.89$ ($N = 2,603$; Valenzuela, Park & Lee, 2009), with other studies reporting internal consistencies of $\alpha = 0.84$ ($N = 103$; Orr et al., 2009), $\alpha = 0.85$ (53.37% of the variance accounted for, $N = 222$; Lou, Yan, Nickerson, & McMorris, 2012), and $\alpha = 0.86$ ($N = 373$; Lampe, Wohn, Vitak, Ellison, & Wash, 2011). However, few authors reported the amount of variance accounted for in these studies.

Other researchers have modified use of the FBI by altering the words of items or reducing the number of items and still achieved strong internal consistency ($N = 246$; $\alpha = 0.92$; Park & Lee, 2014). Sherrell (2014) performed a confirmatory factor analysis (CFA) on the FBI with the factor structure established by Ellison et al. (2007) and identified poor factor loadings with her sample of 717 undergraduate college students (e.g., below 0.70; Kline, 2011); however she did *not* report the specific factor loadings, thus making it difficult to evaluate Sherrell's decision to stray from the factor structure intended by Ellison and colleagues (2007). Sherrell (2014) also conducted an EFA and identified a two-factor structure that accounted for 61.75% of the variance. With the removal of item

six, Sherrell identified a Cronbach's α of 0.89 for the first factor structure, *Emotional Connectedness* (Items 1, 2, 3, 4, 5, and 7) and a Cronbach's α of 0.77 for a second factor labeled *Friends* (Items 8 and 9). With a two-factor solution and the removal of item six, remaining items were between $\alpha = 0.53$ and $\alpha = 0.92$, which were deemed satisfactory (Kline, 2011). Overall, researchers demonstrated success with using the FBI. Therefore, in order to measure the intensity of use of online dating services as a construct, the researcher received guidance from the Dr. Ellison (personal communication, July, 10, 2015) to modify the FBI for use in this study (see Devellis, 2012; Dimitrov, 2012), which resulted in the creation of the *Online Dating Intensity Scale* (ODI).

In order to measure the intensity of an individual's use of online dating services, the researcher modified the FBI in several significant ways. First, the researcher altered references from Facebook and changed them to references to online dating services. The researcher only retained three items related to attitudes about online dating, as Dr. Ellison suggested placing an emphasis on the measure of specific activities (personal communication, July, 10, 2015). Therefore, the researcher altered items to measure specific activities of online daters in quantity, frequency, and duration. The modifications to the FBI resulted in a 10-item instrument on a 5-point Likert scale (see Appendix J). Total scores are obtained by calculating a participant's mean score. The researcher anticipated a two-factor solution (e.g., *attitudes, intensity*) for the assessment and conducted EFA and CFA to explore the psychometric properties of the instrument (see Chapter 4).

Adolescent Measure of Empathy and Sympathy (AMES)

Multiple assessments exist to measure empathy, but each is limited by several shortcomings. First, many scales measure empathy as a single construct without distinguishing cognitive empathy from affective empathy (Vossen et al., 2015). Further, the wording used in most scales is ambiguous, such as items from other assessments that use words like, “swept up” or “touched by” (Vossen et al.). Further, few scales differentiate empathy from sympathy. Therefore, Vossen and colleagues designed the AMES as an empathy assessment that addresses problems related to ambiguous wording and differentiates empathy from sympathy. The AMES is a 12-item empathy assessment with three factors consisting four items per factor (a) *Cognitive Empathy*, (b) *Affective Empathy*, and (c) *Sympathy*. Participants respond to each item on a 5-point Likert scale ranging from (1) never, (2) almost never, (3) sometimes, (4) often, and (5) always. *Affective Empathy* scores are calculated by averaging items 3, 7, 9, and 12; *Cognitive Empathy* scores are calculated by averaging items 1, 3, 8, and 10; and *Sympathy* scores are calculated by averaging items 2, 4, 6, and 11.

Psychometric Properties of the AMES. Researchers normed the AMES in two studies with Dutch adolescents (Vossen et al., 2015). In the first study ($N = 499$; 10-15 years old; 52% male, 48% female), the researchers reduced the 19-item assessment to 12 items, with four items per factor (a) *Cognitive Empathy* ($\alpha = 0.86$), (b) *Affective Empathy* ($\alpha = 0.75$), and (c) *Sympathy* ($\alpha = 0.76$). The affective empathy and cognitive empathy factors correlated at 0.34. The affective empathy factor and sympathy factors correlated at 0.39, and the cognitive empathy and sympathy factors correlated at 0.54. In total, the

three-factor structure accounted for 54.4% of the variance, which is near the recommended 60% of variance accounted for in a strong instrument (Hair et al., 2010).

The authors of the AMES (Vossen et al., 2015) conducted a second study with a sample of 450 Dutch adolescents between the ages of 10-15 (50% male, 50% female). A subsample of participants from this study ($n = 248$) completed the assessment a second time two-weeks later. Participants in this study also completed the *Empathic Concern* and *Perspective Taking* subscales of the *Interpersonal Reactivity Index* (IRI; Davis, 1980); the *Strengths and Difficulties Questionnaire* (SDQ; Van Widenfelt, Goedhart, Treffers, & Goodman, 2003), and an adapted form of the *Aggression Questionnaire* (AQ; Buss & Perry, 1992). Lastly, participants in the second study performed by Vossen and colleagues also completed an adapted version of the *Marlow-Crowne Social Desirability Scale* (Belacchi & Farina, 2012). Vossen and Colleagues used a CFA and identified an acceptable fit with three factors (RMSEA = .07 (90% [CI]: .06/.08), CFI = .94, TLI = .92). Test-retest reliability was also established; correlations were calculated per each factor (a) *affective empathy* ($r = 0.56$), (b) *cognitive empathy* ($r = 0.66$), and (c) *sympathy* ($r = 0.69$). To support construct validity, the IRI's *empathic concern* subscale (Davis, 1980) correlated with all three subscales of the AMES (e.g., affective empathy [$\alpha = 0.29$], cognitive empathy [$\alpha = 0.42$], and sympathy [$\alpha = 0.63$]; Vossen et al., 2015). Further, the IRI's *perspective taking* subscale also correlated with all three subscales of the AMES (e.g., affective empathy [$\alpha = 0.21$], cognitive empathy [$\alpha = 0.45$], and sympathy [$\alpha = 0.36$]; Vossen et al., 2015). Additionally, all AMES subscales were positively related to pro-social behavior (e.g., affective empathy [$\alpha = 0.14$], cognitive empathy [$\alpha = 0.33$], and

sympathy [$\alpha = 0.50$]; Vossen et al., 2015). In order to establish discriminant validity, the affective empathy ($\alpha = -0.12$) and sympathy ($\alpha = -0.36$) subscales were negatively correlated to physical aggressive behavior while cognitive empathy was unrelated ($\alpha = -0.07$). Despite being normed on samples of adolescents, the researcher agreed with the authors' (Vossen et al., 2015) estimation that the AMES would be a reliable and valid measure of empathy and sympathy with alternate samples including emerging adults. Thus, the researcher deemed the assessment to be a viable measure for empathy in the current research investigation.

Sexual-Other Objectification Scale (SOOS)

The objectification of others is a new construct that was identified as an important phenomenon in the cycle of objectification (Davidson et al., 2015; Fredrickson & Roberts, 1997; Linder, Tantleff-Dunn, & Jentsch, 2012; Strelan & Hargreaves, 2005). However, few instruments measure the construct of other-objectification. To examine this construct, researchers have used modified forms of McKinley and Hyde's (1996) *Objectified Body Consciousness Scale* (Zurbriggen et al., 2011) but have called for the development of other scales of partner-objectification. One of the more widely used instruments to measure other-objectification is the *Objectification of Others Questionnaire* (OOQ; Strelan & Hargreaves, 2005).

The OOQ (Strelan & Hargreaves, 2005) is a modified version of Noll and Fredrickson's (1998) *Self-Objectification Questionnaire* (SOQ). Like the SOQ, participants completing the OOQ rank the appearance or competence based

characteristics of others (e.g., males, females). The OOQ consists of five items related to physical appearance based characteristics (e.g., weight, sex appeal, physical attractiveness, measurements, firmness of muscles) and five items related to physical competence (e.g., energy level, coordination, strength, health, fitness) for a total of 10 items. Participants rank the importance of each attribute from 1 (least important) to 10 (most important). Researchers then total the score of each the physical appearance based characteristics and the physical competence based characteristics, and subtract the competence-based scores from the appearance-based scores. The final resulting score ranges between -25 to 25, with positive values identifying greater objectification of others. However, researchers identified difficulties with using the OOQ. For example, Linder, Tantleff-Dunn and Jentsch (2012) attempted to use both the SOQ and the OOQ with a sample of undergraduate college students ($n = 636$) and reported that many participants ($n = 160$ potential participant cases, 25.16%) failed to successfully complete one or both measures. The researchers reported that the style of the assessment (i.e., ranking) made it impossible to use any mean-substitution or data imputation strategy, thus resulting in the researchers' decision to remove the OOQ and SOQ from their analysis. Similarly, Davidson, Gervais, and Sherd (2015) found that some participants *rated* rather than *ranked* (e.g., using the same ranking twice) physical appearance or physical competence based attributes in relation to the other-objectification of women ($n = 182$) and the other-objectification of men ($n = 181$). Therefore, the researcher of *this* investigation opted to *not* use the OOQ to measure other-objectification in this study.

A thorough literature view on the construct of other-objectification (see Chapter

2) failed to identify psychometrically sound instruments to measure the construct of the objectification of others. However, two students at Illinois Wesleyan University (see Curran, 2004; Zolot, 2003) worked to develop a measure of men's objectification of women that the researcher deemed sufficient for modification and use in the current study. Zolot conducted a thorough review of the literature on other-objectification and created a pool of about 60 items related to the objectification of others. The 60-item assessment utilized a 5-point Likert scale with values ranging from "strongly disagree" to "strongly agree." Zolot normed the assessment on a sample of 93 undergraduate students and reported an internal consistency of .89. Zolot and her research team conducted EFA and refined the 60-item assessment to a 25-item assessment ($\alpha = .89$) with four factors.

Curran (2004) further developed Zolot's (2003) instrument by the addition of several newly created items and normed the instrument with a sample of 60 heterosexual male undergraduate participants. Curran and his research team conducted EFA and item analyses that resulted in a 22-item measure ($\alpha = .92$) with strong test-retest reliability ($r [35] = 0.88, p < .01$). Curran also created a short-form of the instrument consisting of 12 items ($\alpha = .86$) with strong test-retest reliability ($r [35] = .88, p < .01$). Total scores for both the long-form and short-form versions of the assessment correlated strongly ($r = .98, p < .01$), and both the long-form and short-form versions of the scales contain three subscales: (a) *Internalized Sexual Objectification*, (b) *Disempathy and Commenting About Women's Bodies*, and (c) *Insulting Unattractive Women*. However, the amount of variance accounted for by each factor was not reported.

The instrument created by Zolot (2003) and Curran (2004) was designed to

measure the other-objectification of the opposite sex from a heterosexual male's point of view. Zolot and Curran's assessment, therefore, measures objectification in a light of potential dating and romantic partners, which aligns with the goal of this investigation. Whereas, in contrast, the OOQ has been used to examine an individual's objectification of individuals who are of the same sex or the opposite sex – regardless of sexual interest in a person – perhaps measuring different aspects of the construct of objectification of others. Neither Zolot nor Curran identified a name for their instrument, therefore this author will refer to this modified instrument as the *Sexual-Other Objectification Scale*.

It is necessary to note that neither Zolot (2003) nor Curran (2004) acquired a large enough sample size to have the power to conduct EFA (Hair et al., 2010). Therefore, the psychometric properties of the instrument need to be interpreted with caution. Further, Zolot and Curran designed their instrument to be used exclusively with heterosexual males, which also calls for caution in the interpretation of the psychometric properties of the instrument when used with different samples. This research investigation explored the objectification of others by both sexes – male and female – regardless of sexual orientation. Therefore, this researcher modified the short-form instrument utilized by Curran to be gender-neutral (e.g., replacing “women” with “people”) and inclusive of gay and lesbian individuals. Additionally, the researcher reworded questions that said “you,” to saying “I.” To exemplify these changes, the researcher modified the item, “You can tell a lot about a woman's sexual availability by how she looks,” to “I can tell a lot about a person's sexual availability by how they look.” The researcher also shortened items that appeared long. For example, after modifying for gender-neutrality, the researcher

shortened an item from “I often imagine what people I meet on a daily basis would be like in bed,” to “I often imagine what someone would be like in bed.” The researcher also reviewed items that were used in Curran’s long-form of the instrument but not the short form and incorporated items that were more gender-neutral than items on the short-form of the instrument. For example, the researcher removed the item, “I am more likely to notice or flirt with a woman with an attractive body than one with an attractive face,” and replaced it with a more gender-neutral item – also modified for to be gender neutral – from Curran’s long-form of the assessment, “The first thing that attracts me to a [person] is a nice body.” The researcher also reordered the questions so that items from the same factor are *not* all in order. Furthermore, the researcher reworded a negatively worded item that was meant to be reverse coded, as reverse-coded items can sometimes confuse participants (DeVellis, 2012; Salazar, 2015). Lastly, the researcher changed the 5-point Likert scale to a 6-point Likert scale that leads participants to choose a response that leans towards a positive or negative agreement (Sriram, 2014). Alterations and modifications made to the assessment resulted in a 12-item assessment that uses a 6-point Likert scale with three anticipated factors. Due to the gender neutral modifications to the instrument, the researcher renamed the anticipated factors to: (a) *Internalized Sexual Objectification* (items 1, 2, 5, 9, and 11), (b) *Disempathy and Commenting About Individuals’ Bodies* (items 4, 6, 8, and 10), and (c) *Insulting Unattractive People* (items 3, 7, and 12). The researcher conducted EFA and CFA to explore the factor structure of the instrument (see Chapter 4).

Relationship Structure Questionnaire (ECR-RS)

Fraley and colleagues (2011) designed The *Relationship Structure Questionnaire* (ECR-RS) to measure an individual's attachment style. The ECR-RS is a 9-item questionnaire with two factors (i.e., *avoidance*, *anxiety*). Participants complete the nine items on a 7-point Likert scale with values ranging from "strongly disagree" to "strongly agree." Scores can be calculated per first reverse coding items one, two, three, and four, and then calculating an average for each factor score. Specifically, items one through six are averaged for the *anxiety* subscale, and items seven through nine are averaged for the *avoidance* subscale.

The ECR-RS is an alternate form of The *Experiences in Close Relationships* (ECR) scale developed by Brennan, Clark, and Shaver (1998). The ECR was originally developed from a pool of 323 items. In its debut study with a sample of undergraduates ($N = 1,085$), the resultant 36-item assessment contained two factors (a) *anxiety* ($\alpha = 0.91$), and (b) *avoidance* ($\alpha = 0.94$). The ECR has been utilized since in over 100 studies nationally and internationally and has been translated into multiple languages (Cameron, Finnegan, & Morry, 2012). While the ECR is a popular assessment, it possessed several limitations due to its Classical Test Theory (CTT) origins (Fraley, Waller, & Brennan, 2000; Mikulincer & Shaver, 2007). Using Item Response Theory (IRT) and factor analysis techniques, Fraley and colleagues (2000) reanalyzed the data originally collected from Brennan et al. (1998) and created the *Experiences in Close Relationships – Revised* (ECR-R). The ECR-R was more psychometrically sound than the ECR but still possessed several limitations including a poor assessment of high attachment security and

redundancy of items (Fraley et al., 2000). Nonetheless, the ECR-R remains a highly used assessment instrument for adult romantic attachment (Sibley, Fischer, & Liu, 2005).

Wei, Russell, Mallinckrodt, and Vogel (2007) revised the original ECR to address the problems related to length and redundancy; however, they did *not* utilize advances made to the assessment by Fraley and colleagues (2000). Through a series of six studies with undergraduate college students, Wei and colleagues (2007) refined the original ECR to a 12-item assessment for use with college student samples. Researchers evaluated limitations to Wei and colleagues' (2007) work due to their use of CTT and norming the assessment on a homogenous samples of North American undergraduate students, and identified "[...] the ECR-S was acceptable only after controlling for two additional latent variables accounting for response sets (which was not the case with the original ECR)" (Lafontaine et al., 2015, p. 2). Therefore, Lafontaine and colleagues (2015) further revised the original ECR through IRT, which is generally regarded as superior to CTT (Embretson & Reise, 2013), to create an alternate short form of the assessment resulting in the creation of the ECR-12. However, Lafontaine and colleagues normed their assessment with couples, couples seeking therapy, and individuals in same-sex relationships, and they established minimal convergent and predictive validity (e.g., relationship satisfaction and psychological distress scales). Further, Lafontaine and colleagues failed to consider other advancements to the assessment made by Fraley and colleagues' (2011).

Fraley and colleagues (2011) addressed several problems that exist in self-report measures of adult attachment. First, most assessment instruments are "referentially

ambiguous” or too narrow and “[...] should specify unambiguously what kind of relationship is being assessed” (Fraley et al., 2011, p. 615). Secondly, most attachment measures are too long (e.g., ECR, ECR-R). Lastly, Fraley and colleagues identified that “[...] contemporary measures of attachment do not allow within-person variation to be assessed across relational contexts” (p. 616), meaning that some individuals might present with different attachment styles in different relational-contexts (e.g., parents, peers, romantic partners). Therefore, Fraley and colleagues created the *Relationships Structure questionnaire* (ECR-RS) – a short-form derivative of the ECR-R.

Psychometric Properties of the ECR-RS. Fraley and colleagues (2011) normed their assessment with a sample of 21,838 individuals who reported dating someone exclusively or being in a marital relationship, including mostly white (70.5%) women (81.5%) from the United States ($n = 14,781$) with other participants from Great Britain ($n = 1,852$), Canada ($n = 1,232$) or elsewhere. Researchers selected an initial pool of 10 modified items from the ECR-R based on their discrimination value, clarity, and *not* being exclusively related to romantic relationships. The 10 items used with a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The authors distributed the assessment four times to participants in relation to maternal relationships, paternal relationships, romantic partner relationships, and friendships, resulting in a 40-item assessment. Fraley and colleagues explored the factor structure of the ECR-RS using principal axis factoring and varimax rotation. Across domains (e.g., maternal, paternal, romantic, friend), two factors represented the data and accounted for over 69% of the variance, which exceeds the recommended level of 60% (Hair et al., 2010). Fraley and

colleagues removed one item for not being “a ‘clean’ measure” (p. 617) and identified a two factor structure (a) *Avoidance* ($\alpha = 0.88$; items 1-6 [items 5 and 6 are reverse-coded]), and (b) *Anxiety* ($\alpha = 0.85$; items 7-9). The Cronbach’s alpha scores represent global scores per factor – a composite score per participant in response to maternal, paternal, romantic, and friend relationships. The authors also presented internal consistency values for each factor per each relational measure (a) maternal (*Avoidance* $\alpha = 0.92$; *Anxiety* $\alpha = 0.88$), (b) paternal (*Avoidance* $\alpha = 0.90$; *Anxiety* $\alpha = 0.90$), (c) romantic (*Avoidance* $\alpha = 0.87$; *Anxiety* $\alpha = 0.91$), and (d) friend (*Avoidance* $\alpha = 0.88$; *Anxiety* $\alpha = 0.90$). Fraley and colleagues identified that the alpha reliability estimates were “highly comparable” to those of longer scales (e.g., ECR, ECR-R; p. 618). Further, the authors reported, “It is possible that the specificity that is added by contextualizing the targets helps to reduce some of the measurement noise that exists when the targets are less precisely specified, thereby allowing the use of fewer items without sacrificing precision” (Fraley et al., 2000, p. 618).

In their second study, Fraley et al. (2011) surveyed 388 individuals in dating or marital relationships. The average age of participants was 22.59 years and consisted of mostly white (72.2%) women (65%). Participants also completed the ECR-R (Fraley et al., 2000), the *Investment Model Scale* to measure relationship quality and functioning (IMS; Rusbult, Martz, & Agnew, 1998), the 9-item version of the *Center for Epidemiological Studies-Depression scale* to measure depressive symptoms (CES-D; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993), and the 44-item *Big Five Inventory* to measure individual differences (John & Srivastava, 1999). As it relates specifically to

romantic partners, the authors also presented internal consistency values for each factor (*Avoidance* $\alpha = 0.81$; *Anxiety* $\alpha = 0.83$). The authors identified relationships between the ECR-RS *anxiety* subscales and ECR *anxiety* ($r = 0.66$) and *avoidance* subscales ($r = 0.31$), as well as relationships between the ECR-RS *avoidance* subscales and ECR *anxiety* ($r = 0.31$) and *avoidance* subscales ($r = 0.56$), demonstrating appropriate concurrent validity.

Regarding attachment styles with romantic partners, the Fraley et al. (2011) also identified relationships between ECR-RS *anxiety* subscale scores and variables from the IMS including *commitment* ($r = -0.22$), *satisfaction* ($r = -0.37$), *alternatives* ($r = 0.21$), *investment* ($r = -0.09$), and CES-D depression score ($r = 0.33$). The moderate negative relationship between the *satisfaction* score of the IMS and the *anxiety* subscale of the ECR-RS established discriminant validity for the *anxiety* subscale of the ECR-RS. Furthermore, the moderate positive relationship between the CES-D score and the *anxiety* subscale score of the ECR-RS indicated an appropriate relationship between the constructs, thus supporting the convergent validity of the *anxiety* subscale score of the ECR-RS.

Fraley et al. (2011) also presented the same relationships with the ECR-RS *avoidance* subscale scores with the IMS including *commitment* ($r = -0.53$), *satisfaction* ($r = -0.49$), *alternatives* ($r = 0.38$), *investment* ($r = -0.28$), and CES-D depression score ($r = 0.27$). The relationships between the subscale scores of the IMS and the *avoidance* subscale of the ECR-RS – specifically the negative relationship with the *commitment* subscale – established discriminant validity for the *avoidance* subscale of the ECR-RS.

Furthermore, the small positive relationship between the CES-D score and the *avoidance* subscale score of the ECR-RS is theoretically appropriate, thus supporting the convergent validity of the *avoidance* subscale of the ECR-RS.

Additionally, Fraley et al. (2011) presented participants' romantic relationships ECR-RS subscale scores for *anxiety* and the *Big Five Personality Traits* (John & Srivastava, 1999), *Extraversion* ($r = -0.13$), *agreeableness* ($r = -0.25$), *neuroticism* ($r = 0.22$), *conscientiousness* ($r = -0.20$), and *openness* ($r = -0.09$). The researchers also presented participants' romantic relationships ECR-RS subscale scores for *avoidance* and the Big Five Personality Traits, *extraversion* ($r = -0.12$), *agreeableness* ($r = -0.28$), *neuroticism* ($r = 0.08$), *conscientiousness* ($r = -0.29$), and *openness* ($r = 0.03$). The relationships identified between the subscale scores of the *Big Five Personality Traits* and the subscales scores of the ECR-RS indicate theoretical levels of connection between the constructs. In total, the relationships between the subscale scores provided evidence for convergent and discriminant validity for the ECR-RS.

While the validity and reliability of the ECR-RS was supported with this data, Fraley et al. (2011) identified two main limitations with the assessment. First, there are few reverse-coded items and they exist only on the *avoidance* subscale. Second, like all attachment instruments, the ECR-RS is less successful at differentiating between people with secure attachment. Nonetheless, no known self-report instruments to measure attachment are infallible. Therefore, with evidence for validity and reliability, the researcher determined the ECR-RS to be an appropriate instrument for this research investigation.

Relationship Assessment Scale (RAS)

Hendrick (1988) developed the *Relationship Assessment Scale* to measure relationship satisfaction in a variety of close relationships. The RAS is a 7-item instrument with a 5-point Likert scale where “1” represents low levels of relationship satisfaction and “5” represents high levels of relationship satisfaction. Due to the nature of the items on the assessment, the response for each item varies. For example, for item 1, “How well does your partner meet your needs?” a response of “1” indicates “poorly” whereas a response of “5” indicates “extremely well.” In contrast, for item 2, “In general, how satisfied are you with your relationship?” a response of “1” indicates “unsatisfied,” whereas a response of “5” indicates extremely satisfied. Items 4 and 7 are reverse coded. To score the assessment, item totals are averaged. Across multiple samples of married and dating couples, average scores ranged from 4.05 to 4.37, whereas clinical samples tend to have lower averages at 3.27 for women and 3.66 for men (see Table 1; Hendrick, Dicke, & Hendrick, 1998).

Table 1

RAS means and standard deviations with multiple samples

Sample	Sample size	<i>M</i>	<i>SD</i>
Intercultural couples ^a			
Anglo	30 women	4.31	.51
Anglo	30 men	4.19	.57
Bicultural	27 women	4.05	.63
Bicultural	27 men	4.19	.66
Hispanic-oriented	27 women	4.13	.80
Hispanic-oriented	27 men	4.37	.51
Parental couples ^b			
	99 women	4.07	.90
	92 men	4.22	.85
Dating couples ^c			
	149 women	4.33	.63
	149 men	4.30	.64
Clinical sample ^d			
	40 women	3.27	1.03
	30 men	3.66	.87

Note. Chart adapted from “The Relationship Assessment Scale,” by S. S. Hendrick, H. Dicke, and C. Hendrick, 1998, *Journal of Social and Personal Relationships*, 15, pp 137-142. ^aData from Contreras, Hendrick, and Hendrick, 1996. ^bData from Inman-Amos, Hendrick, and Hendrick (1994). ^cData from Meeks (1996). ^dData from Unpublished data set (1997).

Psychometric Properties of the RAS. Hendrick (1988) normed the assessment on a sample of 125 undergraduate psychology students who reported being “in love.” Hendrick conducted an EFA using principal-components factor analysis and identified a one-factor solution that identified 46% of the variance. Hendrick also administered several additional assessments to participants. Participants completed *The Love Attitudes Scale* (LAS; Hendrick & Hendrick, 1986) which measures different love styles (e.g., *Eros* [passionate love], *Ludus* [game-playing love], *Storage* [friendship love], *Pragma*

[practical love], *Mania* [possessive, dependent love, and *Agape* [altruistic love]].

Participants also completed *The Sexual Attitudes Scale* (Hendrick, Hendrick, Slapion-Foote, & Foote, 1985), which includes four subscales: *Permissiveness* (casual sex), *Sexual Practices* (responsible sex), *Communion* (idealistic sex), and *Instrumentality* (utilitarian sex). Furthermore, participants completed the *Self-Disclosure Index and Opener Scale* (Miller, Berg, & Archer, 1983), which explores willingness to make self-disclosure to specific others as well as to elicit self-disclosure from others. Lastly, participants completed two items that measured self-esteem, four items exploring beliefs about their ability and their partner's ability to attract others and their investment in the relationship, and four items regarding commitment (Lund, 1985). Hendrick conducted a second study with a sample of 57 dating couples using the RAS, the LAS (Hendrick & Hendrick, 1986), and the *Dyadic Adjustment Scale* (DAS; Spanier, 1976; Spanier & Thompson, 1982), which utilizes four subscales: *Dyadic Satisfaction*, *Dyadic Cohesion*, *Dyadic Consensus*, and *Affection Expression*. The results of Hendrick's two studies are delineated in Table 2.

Table 2

Correlations of the RAS total score with other measures

Measure	Study 1 (<i>n</i> = 125)	Study 2 (<i>n</i> = 114)
Eros	.60*	.50*
Ludus	-.30*	-.53*
Storage	.14	.01
Pragma	.04	-.04
Mania	-.05	-.12
Agape	.36*	.21*
Permissiveness	-.14	-
Sex practices	.15	-
Communion	.24*	-
Instrumentality	.01	-
Self-esteem	.24*	.27*
Self-disclosure, lover	.41*	-
Opener	.21*	-
Commitment	.55	-
Alternative partner	-.21	-
Investment	.45*	-
Dyadic consensus	-	.62*
Dyadic satisfaction	-	.83*
Dyadic cohesion	-	.57*
Affectional expression	-	.51*
Total DAS	-	.80*

Note. Chart adapted from “A Generic Measure of Relationship Satisfaction, by S. S. Hendrick, 1988, *Marriage and the Family*, 50, pp. 137-142. **p* < .05

The results of Hendrick’s (1988) two studies indicated strong concurrent validity and appropriate convergent and discriminant validity for the RAS. Additionally, in Hendrick’s second study, participants were contacted at the end of a school semester (*n* = 31) to determine whether the couple was still dating. The RAS predicted 91% of the “together” and 57% of the “apart” participants, thus establishing predictive validity with samples of college students.

In addition to validity, the RAS also demonstrated strong reliability with a variety of samples (Graham, Diebels, & Barnow, 2011). Graham and colleagues (2011) conducted a meta-analysis regarding measures of relationship satisfaction and identified strong internal consistency for the RAS with an average Cronbach's alpha score of .872 over 196 studies. The authors reported, "subsequent research has shown that the RAS tends to produce more reliable scores than initially indicated during the development of the measure" (p. 45). Therefore, the researcher determined the RAS to be a valid and reliable instrument for use in this research investigation.

Marlowe-Crowne Social Desirability Scale – Form A (MCSDS-FA)

Crowne and Marlowe (1960) developed the *Marlowe-Crowne Social Desirability Scale* (MCSDS) to measure social desirability in participant response sets. The authors normed the initial scale with a sample of college students ($n = 76$) and modified the instrument to 33-items with strong internal consistency ($\alpha = .0.88$) and test-retest reliability ($r = 0.89$). The MCSDS is a popular instrument and has been used in over 700 research investigations (Barger, 2002). However, due to the length of the MCSDS, multiple short forms of the assessment have also been published, including three developed by Strahan and Gerbasi (1972) and three by Reynolds (1982).

Variations on Strahan and Garbasi's (1972) and Reynolds' (1982) short forms of the assessments have been utilized in hundreds of research studies (Barger, 2002). Some researchers have lauded the short forms of the assessment for being stronger assessments than the original (Fischer & Fick, 1993), whereas other researchers have criticized

shortcomings of the short form versions of the MCSDS for first component factors accounting for low levels of variance in total scores (16%, Reynolds, 1982; 13%, Strahan & Gerbasi, 1972), and demonstrating low levels of internal consistency reliability (Barger, 2002). As such, researchers have repeatedly tested the assortment of short forms of MCSDS, and reported inconsistent findings as to which assessment is the superior short form of the MCSDS (Fischer & Fick, 1993; Loo & Thorpe, 2000).

Reynolds (1982) originally created Form A, B, and C short form versions of the MCSDS, and normed the three forms with a sample of 608 undergraduate students ($n = 369$ female, 60.7%, 81.2% white, $M = 20.54$ years old, $SD = 4.01$ years, with a range of 17 to 54 years old), 30.5% freshmen, 29.8% sophomores, 21.0% juniors, and 19.7% seniors). Participants completed the original MCSDS along with Strahan and Gerbasi's (1972) short forms of the assessment. The results of the study are delineated in Table 3.

Table 3

Means and Standard Deviations of the MCSDS Short Forms and relationship to the

MCSDS

Scale	No. of Items	<i>X</i>	<i>SD</i>	Average item <i>X</i>	Skewness	<i>r</i>
MC Standard	33	15.00	5.91	.46	.24	
MC Form A	11	4.81	2.80	.44	.26	.91
MC Form B	12	5.23	2.00	.44	.29	.92
MC Form C	13	5.67	3.20	.44	.27	.93
MC Form XX	20	9.19	4.05	.46	.18	.95
MC Form X1	10	4.44	2.14	.44	.16	.85
MC Form X2	10	4.76	2.30	.48	.17	.88

Note. Chart adapted from “Development of Reliable and Valid Short Forms of the Marlowe-Crowne Social Desirability Scale,” by W. M. Reynolds, 1982, *Journal of Clinical Psychology*, 38, pp. 119-125.

Standard form (Crowne & Marlowe, 1960)

Form A (Reynolds, 1982) items: 3, 6, 13, 15, 16, 19, 21, 26, 28, 30

Form B (Reynolds, 1982) items: 3, 6, 12, 13, 15, 16, 19, 21, 26, 28, 30

Form C (Reynolds, 1982) items: 3, 6, 10, 12, 13, 15, 16, 19, 21, 26, 28, 30

Form XX (Strahan & Gerbasi, 1972) items: 2, 4, 6, 11, 12, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 28, 30, 33

Form X1 (Strahan & Gerbasi, 1972) items: 11, 15, 16, 17, 19, 22, 23, 25, 26, 33

Form X2 (Strahan & Gerbasi, 1972) items: 2, 4, 6, 12, 14, 20, 21, 24, 28, 30

r – Correlation with the standard 33-item Social Desirability Scale

p < .001

Fisher and Fick (1993) administered various forms of the MCSDS to a sample of 390 undergraduate college students (65% female, 52% between the age of 19 and 30 years old). The authors identified strong internal consistency in all of the short forms of the scale, strong correlations with the standard MCSDS, and good model fit. The authors’ data is presented in Table 4.

Table 4

Goodness-of-Fit Indices for Social Desirability Measures

SD Form	No. of Items	AGFI	RMS	Assessment of Fit				
				Chi Sq	<i>df</i>	BBI	ALPHA	<i>r</i>
Standard	33	.396	.054	673	495	.500	.963	
Form A	11	.958	.039	65	4	.787	.863	.941
Form B	12	.949	.040	70	54	.825	.875	.965
Form C	13	.916	.047	103	65	.775	.891	.965
Form XX	20	.781	.051	236	170	.648	.937	.976
Form X1	10	.968	.035	32	35	.831	.876	.958
Form X2	10	.949	.044	47	35	.751	.880	.908

Note. Chart adapted from “Measuring Social Desirability: Short-Forms of the Marlowe-Crowne Social Desirability Scale, by D. G. Fischer and C. Fick, 1993, *Educational and Psychological Measurement*, 53, pp. 417-424.

Standard form (Crowne & Marlowe, 1960)

Form A (Reynolds, 1982) items: 3, 6, 13, 15, 16, 19, 21, 26, 28, 30

Form B (Reynolds, 1982) items: 3, 6, 12, 13, 15, 16, 19, 21, 26, 28, 30

Form C (Reynolds, 1982) items: 3, 6, 10, 12, 13, 15, 16, 19, 21, 26, 28, 30

Form XX (Strahan & Gerbasi, 1972) items: 2, 4, 6, 11, 12, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 28, 30, 33

Form X1 (Strahan & Gerbasi, 1972) items: 11, 15, 16, 17, 19, 22, 23, 25, 26, 33

Form X2 (Strahan & Gerbasi, 1972) items: 2, 4, 6, 12, 14, 20, 21, 24, 28, 30

r – Correlation with the standard 33-item Social Desirability Scale

The results of Reynolds (1982) and Fisher and Fink (1993) support that all the short forms of the MCSDS have a strong model fit and have demonstrated validity and reliability with samples of undergraduate students. However, for this investigation, the researcher deemed Reynolds’ short form MCSDS Form A (MCSDS-FA) as the most efficient version (e.g., fewest items, strong psychometric properties) of the assessment. Therefore, this investigation used MCSDS-FA to measure participants’ social desirability.

Research Design

This study followed a correlational research design to determine directional relationships between emerging adults' online dating, levels of empathy, objectification of others, and relationship quality with romantic partners without any manipulation (Fraenkel, Wallen, & Hyun, 2011). Correlational research examines the relationship between multiple variables without any manipulation (Gall et al., 2007). Correlational methods can be used to determine the strength and direction of relationships between variables, though it does *not* indicate causation between variables (Graziano & Raulin, 2007). In order to support the existence of cause and effect relationships, researchers must establish that (a) measured variables are related, (b) temporal precedence, and (c) the absence of confounding factors (Cook & Campbell, 1979; Johnson & Christenson, 2004). Nonetheless, correlational studies allow researchers to investigate potential cause and effect relationships between constructs and predictive outcomes (Tabachnick & Fidell, 2013). Furthermore, Fraenkel and Wallen (2009) recommended researchers using correlational methods seek alternative explanations for relationships found in. While correlational methods are often used in the counseling literature, there is a call for researchers to use more advanced correlational analyses (e.g., SEM) to explain complex relationships between variables (Crocket, 2012; Fassinger, 1987; Quintana & Maxwell, 1999).

Threats to Validity

Validity refers to “[...] the appropriateness, meaningfulness, and usefulness of specific inferences made from test scores” (Gall et al., 2007, p. 657). Correlational research designs are vulnerable to several threats to validity including: (a) external validity, (b) internal validity, and (c) test validity. The following section presents relevant threats to validity in this study as well as protective measures taken to strengthen the validity of the investigation.

External validity. External validity is defined as the ability to generalize research results from the sample studied to the population of interest (Fraenkel & Wallen, 2009; Gall et al., 2007). External validity is composed of (a) population validity, and (b) ecological validity. Population validity is the degree to which research results from the sample studied are generalizable to the population of interest (Johnson & Christensen, 2004). It is important to recognize that participants’ knowledge of being studied may have influenced how participants responded to assessment items (Heppner, Wampold, & Kivilghan, 2008). Further, the sample of participants in the study may have possessed unique characteristics that led to their participation in the study (i.e., response bias) that does *not* accurately represent individuals who did *not* participate in the study (Johnson & Christensen, 2004). The researcher discusses the potential implications of this limitation in the discussion section (see Chapter 5).

Ecological validity is the extent to which research results from the sample studied are generalizable to the population of interest across settings (Johnson & Christensen, 2004). For example, this investigation occurred during the fall semester of a college

school year in the year 2015, and it is unknown how the time of year of the study impacted the results of the study. While it is difficult to protect the integrity of a study from threats to ecological validity, replication of the study at a different time and with other samples of students may further support or contest conclusions drawn from this investigation.

Internal validity. Internal validity is the extent to which the conclusions drawn from a study – the relationship between independent and dependent variables – is true (Johnson & Christensen, 2004). To mitigate threats to internal validity, non-measured (i.e., extraneous) variables must be accounted for and controlled (Johnson & Christensen). This process helps to promote trustworthy results.

This study was vulnerable to several threats to internal validity including: (a) instrumentation, (b) characteristic correlations, (c) testing, (d) extraneous variables, and (e) attrition. Beginning with instrumentation, it is necessary to acknowledge that instruments do *not* measure constructs perfectly (Graziano & Raulin, 2006; Johnson & Christensen, 2004). Therefore, it is necessary to examine psychometric properties of instruments being used in the investigation (Graziano & Raulin). Further, the use of self-report instruments is another threat to validity, as participants can inaccurately (i.e., randomly or falsely) respond to assessment items. To protect against instrument-related threats to internal validity, the researcher selected valid and reliable measurements of constructs (Graziano & Raulin), accounted for measurement error in the data analysis (Kline, 2011), and accounted for social desirability responses through the employment of the MCSDS-FA (Reynolds, 1982).

Another threat to internal validity is characteristic correlation – the possibility that correlations between variables are founded on participant characteristics rather than the constructs being studied (Fraenkel et al., 2011). Threats to internal validity cannot be protected against; however, the researcher collected participant demographic information and used it in the analysis to examine unique relationships between covariates.

Testing also threatens internal validity (Graziano & Raulin, 2006). The process of a participant responding to items on an assessment may impact how they respond to items of other instruments (Graziano & Raulin). This threat is especially present in this study with the utilization of multiple assessments in a particular sequence. Because of the threat of attrition or testing-fatigue, the items were presented in a specific order to encourage collection of the most important information to this study (e.g., completion of the ODI). Thus, the testing threat to validity was *not* controlled for in this investigation.

Extraneous variables (Gall et al., 2007) also threatened the internal validity of this study. Extraneous variables – unaccounted for and uncontrolled variables – may have impacted the dependent variables of interest. The researcher collected demographic information to examine and account for any unique relationships that may have influenced the dependent variables, but other extraneous variables were *not* measured and may have impacted the results of the study.

Lastly, attrition was a threat to internal validity (Gall et al., 2007). Specifically, some participants *began* the data collection packet but did *not complete* the study, resulting in missing data (Fraenkel & Wallen, 2009). Attrition can result from a variety of factors that are difficult to control for and result in missing data (Gall et al., 2007)

Occasionally, missing data is random and ignorable, and other times it is indicative of a particular response pattern or flawed instrumentation or methodology (Hair et al., 2010). The researcher accounted for attrition as a threat to internal validity by assessing for patterns and severity of missing data (Hair et al.). Through assessment of the data in this study, the researcher deemed the missing data to be missing completely at random (MCAR) and ignorable (e.g., less than 5% missing per variable; Kline, 2011), and use pairwise deletion to analyze the research questions (Schumacker & Lomax, 2010; Tabachnick & Fidell, 2013). The researcher delineates the assessment and handling of missing data in Chapter 4.

Test validity. Test validity refers to the strength and reliability of the psychometric properties of instruments used to measure constructs in a study (Reynolds, Livingston, & Wilson, 2010). Test validity consists of (a) construct validity, (b) content validity, and (c) criterion validity. Construct validity is the “extent to which a set of measured variables actually represent the theoretical latent construct they are designed to measure” (Hair et al., 2010, p. 613). Construct validity includes convergent and discriminant validity, with convergent validity referring to the relatedness of two measures in a construct that *should* relate to one another and discriminant validity examining the relatedness of two measures in a construct that *should not* relate to one another (Reynolds et al. 2010). The researcher promoted construct validity in this investigation by providing clear and operationalized definitions of the subjects of interest in this study (e.g., empathy, objectification of others) and conducting EFA and CFA of instruments used with each construct in the study (Graziano & Raulin, 2006). EFA and

CFA can be used to ensure the fidelity of the constructs being studied (e.g., removing items with low internal consistency; Tabachnick & Fidell, 2013).

Content validity is “[...] the assessment of the correspondence of the variables to be included in a summated scale and its conceptual definition” (Hair et al., 2010, p. 125) and criterion validity is composed of *concurrent validity* (i.e., the results of an assessment being similar to another assessment meant to measure the same construct) and *predictive validity* (i.e., the results of an assessment predicting past or future outcomes; Reynolds et al., 2010). The researcher promoted content validity and criterion validity by conducting a thorough and critical review of the literature regarding the instruments utilized in this research study. To establish concurrent validity, the researcher explored correlations between the constructs of interest. To establish predictive validity, the researcher conducted logistic regressions to determine what traits predicted use of online dating services. Further, the psychometric properties of the instruments used in this study were compared to psychometric properties of the instruments used in previous studies to establish similarities and differences.

In summary, this study followed a correlational research design to investigate the research hypothesis and questions without any manipulation. While correlational methods do *not* indicate causation between variables, correlational research can be used to determine the strength and direction of relationships between variables. However, correlational research is vulnerable various threats to validity. Therefore, the researcher took several steps to mitigate against these threats to validity during the planning and implementation stages of the investigation.

Research Hypothesis and Exploratory Questions

The purpose of this research study was to investigate the directional relationship between emerging adults' use of online dating services (e.g., websites, applications), levels of empathy and objectification of others, and quality of relationships with romantic partners. The following section presents the primary research question, research hypothesis, and exploratory questions. Measurement and structural models for the research hypothesis are provided (see Figures 7 to 11).

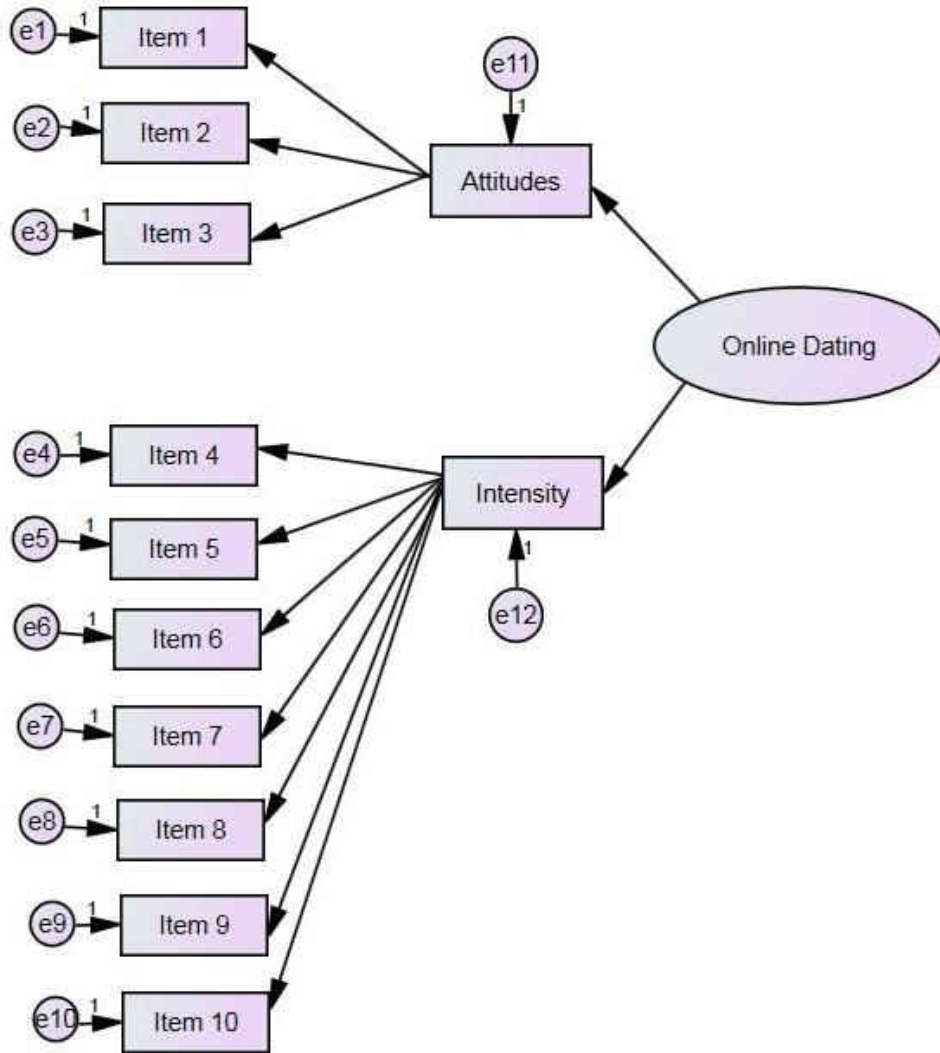


Figure 7: Anticipated Measurement Model for the ODI

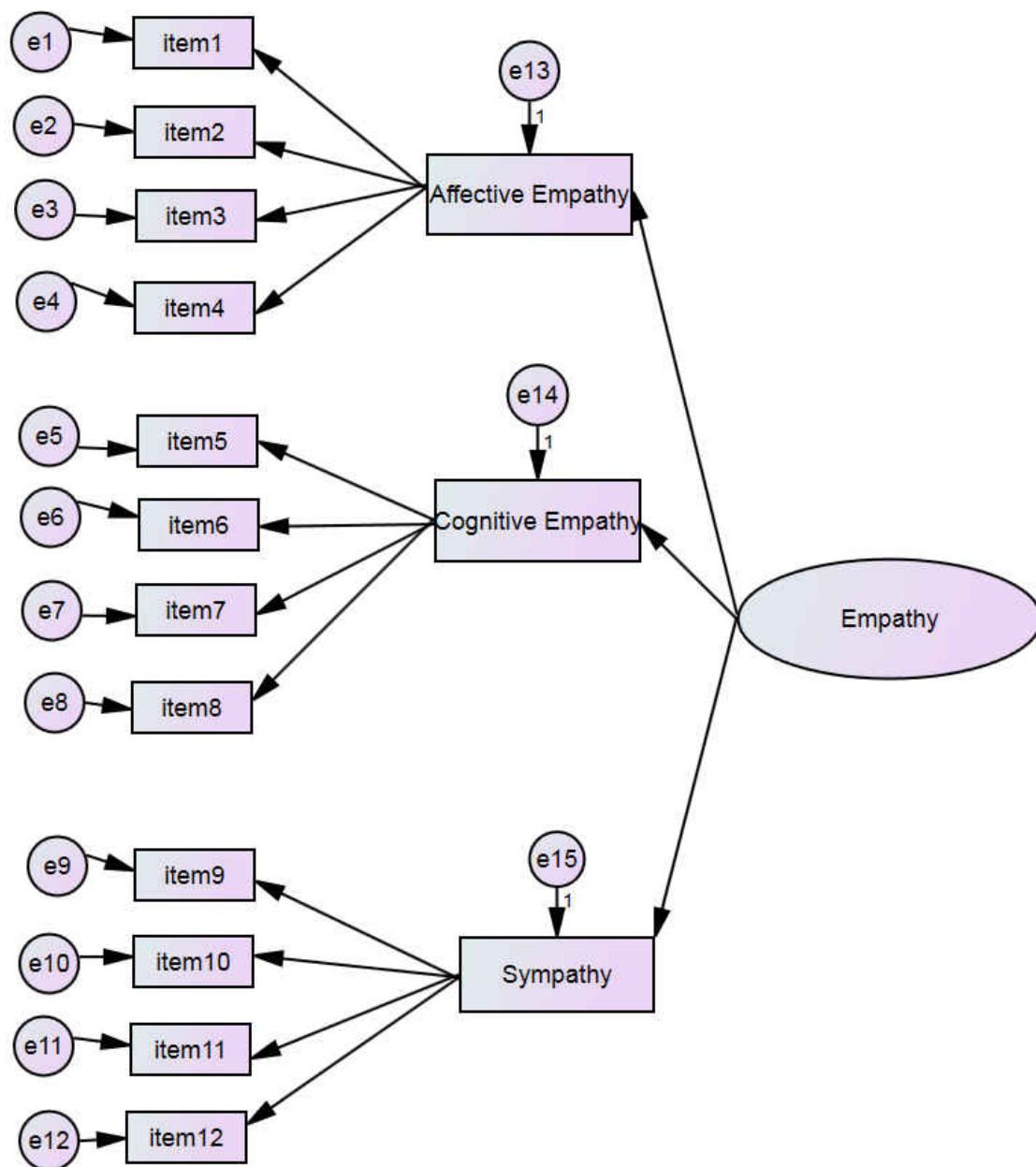


Figure 8: Measurement Model for the AMES

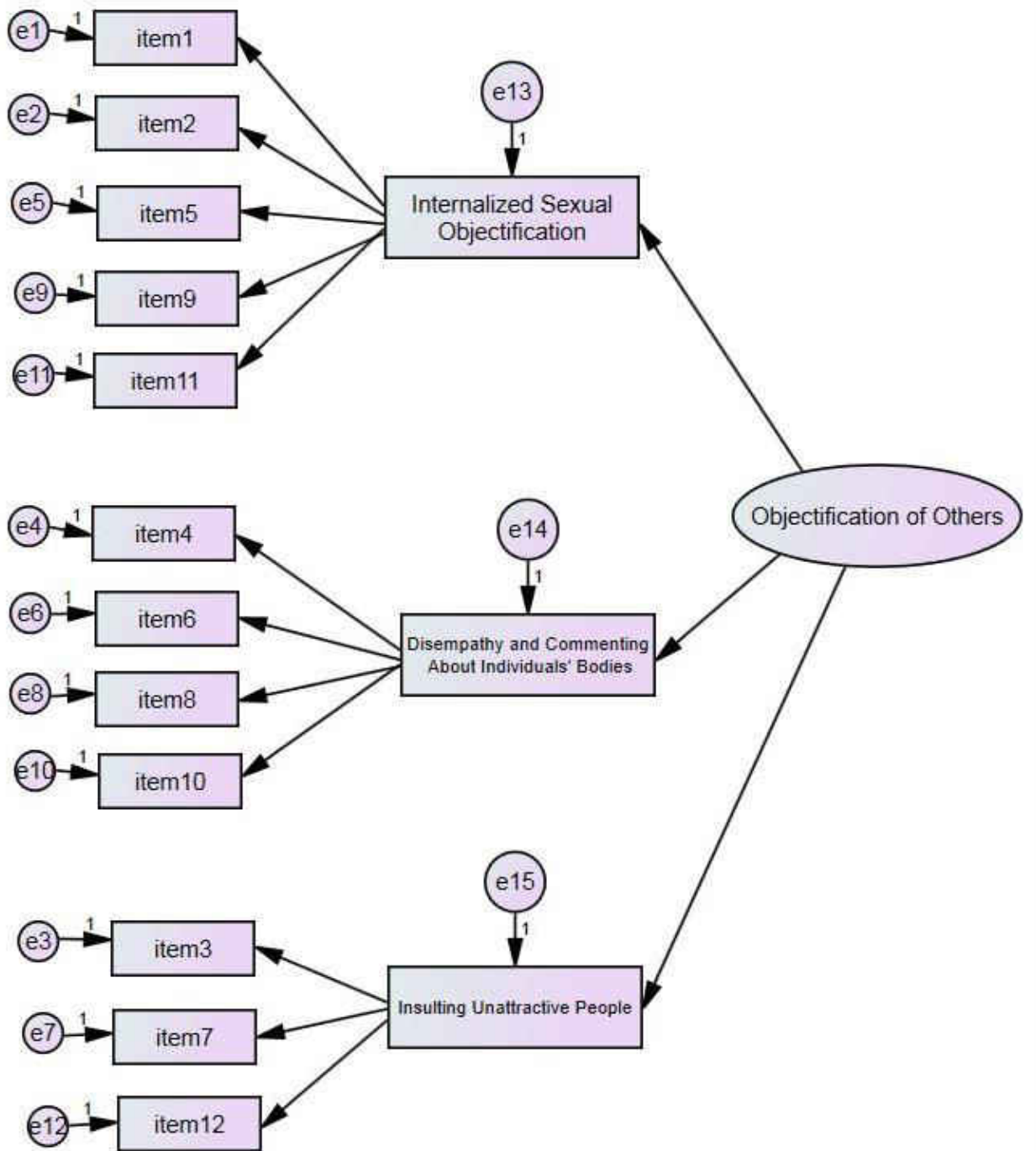


Figure 9: Anticipated Measurement Model for the SOOS

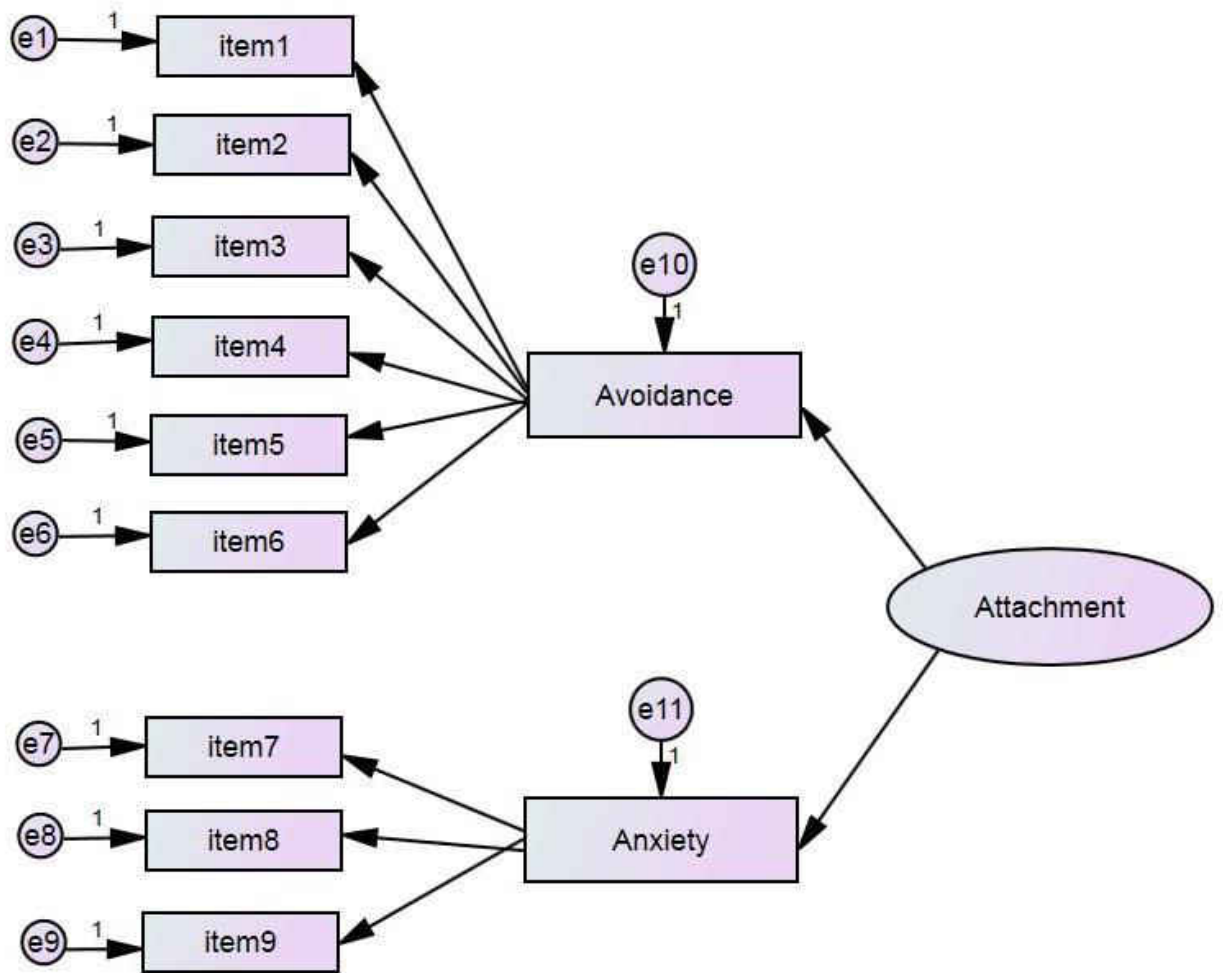


Figure 10: Measurement Model for the ECR-RS

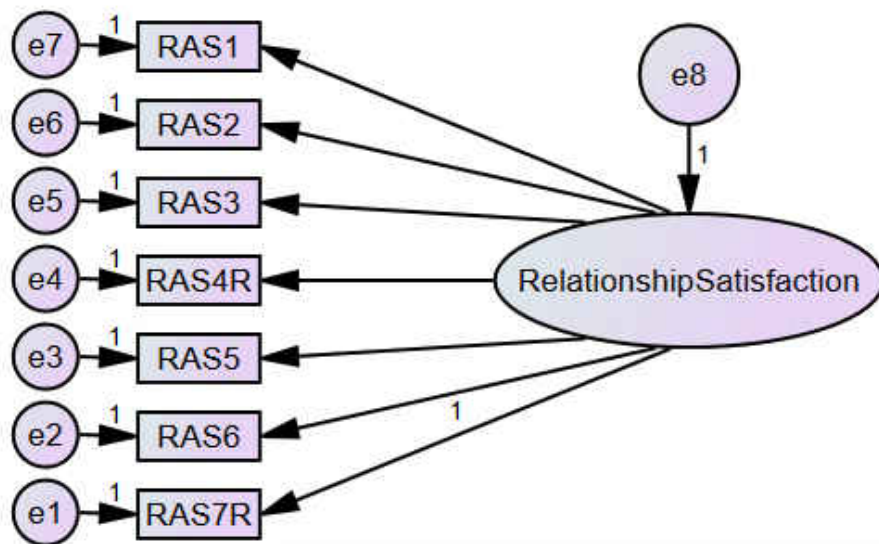


Figure 11: Measurement Model for the RAS

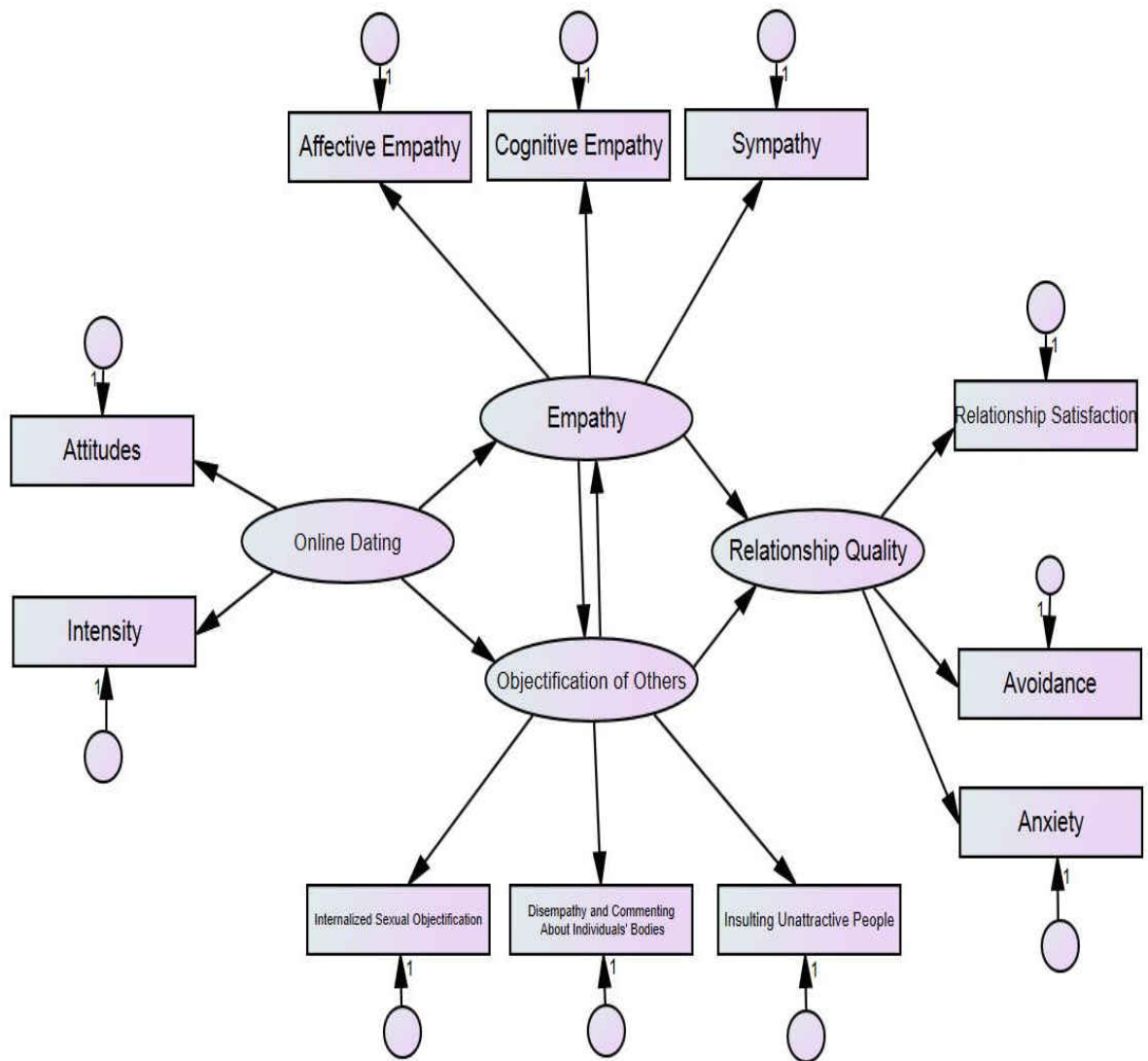


Figure 12: Path Diagram of the Structural Model to be Tested

Primary Research Question

Do emerging adults' use of online dating websites and applications (as measured by the ODI) contribute to their levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS), and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988])?

Research Hypothesis

Emerging adults' intensity of use of online dating services (as measured by the ODI) contribute to their levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS), and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]). Specifically, emerging adults' greater intensity of online dating service use contributes to decreased levels of empathy, increased levels of objectification of others, and poorer quality of relationships with romantic partners.

Exploratory Research Questions

1. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) the

online dating website or application (e.g., eHarmony, OkCupid, Tinder) emerging adults use for online dating?

2. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) with (or and) their reported demographic variables (e.g., age, gender, ethnicity, year in college, sexual orientation)?
3. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) with (or and) their scores of social desirability (as measured by the MCSDS-A (Reynolds, 1982)?
4. Is there a difference between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) based on the data collection method?

Data Analysis

The researcher collected data utilized in this research study in person and from an electronic survey hosted on Qualtrics (www.qualtrics.com), which included the *General Demographics Questionnaire* and six assessment instruments including (a) the ODI, (b) AMES (Vossen et al., 2015), (c) the SOOS, (d) ECR-RS (Fraley et al., 2011), (e) RAS (Hendrick, 1988) and (f) MCSDS-FA (Reynolds, 1982). The researcher downloaded the data to *Statistical Program Systems 20th edition* (SPSS, 2011). Data analysis used both SPSS (for data cleaning and Multiple Regression analysis) and the *Analysis of Moment Structure 21st edition* (AMOS, 2012; for Structural Equation Modeling [SEM] analysis). AMOS is a SEM statistical software that allows researchers to create and modify path diagrams and to analyze theoretical models (Byrne, 2010).

The researcher cleaned the data by first analyzing missing data (Hair et al., 2010), and then addressing outliers (Crocket, 2012). The researcher tested data for normality, homogeneity, and multicollinearity, to ensure that data were appropriate for Multiple Regression and SEM analysis (Schumacker & Lomax, 2010). The following sections delineate the data analysis procedures used to test the research hypothesis and research questions.

Research Hypothesis

This study utilized SEM – also known as Latent Variable Modeling – to analyze the research hypothesis. SEM is a confirmatory procedure encompassing a wide array of additional statistical methods including multiple regression, path analysis, and

confirmatory factor analysis in order to examine the directional relationships of multiple variables (Kline, 2011; Schumacker & Lomax, 2010; Tabachnick & Fidell, 2013). While SEM can be used in experimental designs, it is commonly used in correlational studies (Kline, 2011), and is increasingly being used in counseling research (Crocket, 2012; Quintana & Maxwell, 1999).

The theoretical model tested in this research study contained both latent and manifest variables. Manifest variables – or observed variables – are factors composed of subscale scores directly measured by assessments, and latent variables are theoretical constructs composed of manifest variables (Kline, 2011; Schumacker & Lomax, 2010). The latent variables studied in this investigation were (a) intensity of online dating service use (e.g., websites and applications), (b) empathy, (c) objectification of others, and (d) quality of relationships with romantic partners. Manifest variables in this research study consisted of subscales composed of individual items from the data collection instruments (Kline, 2011). In the models presented in this study, latent variables are represented by ovals in figures while manifest variables are represented by rectangles. Directionality of relationships between the variables is presented in this study by the use of one-way arrows, and two-way arrows represent correlations between variables. Absence of lines connecting variables indicates no hypothesized direct effects. Unique to SEM, is the representation of two kinds of models, (a) the measurement model, which indicates how manifest variables contribute to latent variables; and (b) the structural model, which identifies hypothesized relationships between constructs (Schumacker &

Lomax, 2010). A strength of SEM is that measurement error is accounted for (Schumacker & Lomax, 2010).

The hypothesized theoretical model (structural model) is presented in Figure 5. This structural model presents online dating services as a predictor for levels of empathy and objectification, and relationship quality with romantic partners. An 11-factor model of these variables was hypothesized (e.g., *Attitudes, Intensity, Affective Empathy, Cognitive Empathy, Sympathy, Internalized Sexual Objectification, Disempathy and Commenting on Individuals' Bodies, Insulting Unattractive People, Relationship Satisfaction, Avoidance, anxiety*). The model also included four hypothesized latent variables (e.g., *Online Dating, Empathy, Objectification of Others, Relationship Quality*). Use of online dating services is a latent variable with two anticipated manifest variables (i.e., *Intensity, Attitudes*) composed of 10 items – seven items for the *intensity* factor and three items for the *attitudes* factor. Empathy is a latent variable with three manifest variables (i.e., *Cognitive Empathy, Affective Empathy, and Sympathy*) with 12 direct measured items, four per factor. Objectification of others is another latent variable composed of three anticipated manifest variables (i.e., *Internalized Sexual Objectification, Disempathy and Commenting About Women's Bodies, and Insulting Unattractive Women*) consisting of 12 items. Lastly, quality of relationship with romantic partners is measured by two manifest variables of the ECR-RS (i.e., *Anxiety and Avoidance*, Fraley et al., 2011) consisting of nine items total and one manifest variable of the RAS composed of seven items measuring relationship satisfaction (Hendrick, 1988). The researcher hypothesized that emerging adults' greater intensity of use of online

dating services would predict *lower* levels of empathy, *higher* levels of objectification of others, and also *poorer* quality of relationships with romantic partners.

Steps in SEM

Prior to conducting SEM, missing data must be addressed and all data must be cleaned (Tabachnick & Fidell, 2013). Further, several assumptions must be met in order to conduct SEM: (a) linearity, (b) absence of multicollinearity and singularity, (c) multivariate normality, and (d) residuals centered or close to zero (Tabachnick & Fidell). SEM requires the following five steps to be followed: (a) model specification, (b) model identification, (c) model estimation, (d) model evaluation, and (e) model modification (Byrne, 2010; Crockett, 2012; Schumacker & Lomax, 2010). The following section clarifies these five steps further:

Model specification. With rich understanding of the literature regarding the constructs of interest, the researcher develops a theoretical model of relationships between the constructs (Schumacker & Lomax, 2010). The researcher justifies the relationships identified in the model (Crockett, 2012); and the researcher determines which parameters are *fixed* (i.e., no relationship between variables) or *free* (i.e., estimated from data). A visual path diagram of the model is then developed using SEM software (e.g., AMOS; Byrne, 2010).

Model identification. This step in the process identifies whether or not the model is viable for SEM analysis. For the model to yield usable results with SEM analysis, the specified model must be capable of obtaining a “unique solution and parameter

estimates” (Crocket, 2012, p. 34). Two kinds of models must be identified: (a) the measurement model (i.e., relationships between observed variables and latent measures) and (b) the structural model (i.e., the relationship between latent variables).

The measurement model is evaluated through the use of CFA. The researcher hypothesizes factor structures *a priori* and then uses CFA to empirically support the model; this allows errors to correlate and for multiple items (i.e., indicators) to correlate to various latent variables (Tabachnick & Fidell, 2013). Factor loadings are regarded as poor if under 0.32, fair at 0.45, good at 0.55, very good at 0.63, and excellent at 0.71 (Comrey & Lee, 1992; Tabachnick & Fidell, 2013). Crocket (2012) recommends following O’Brien’s (1994) criteria. With the measurement model established, structural relationships between the latent factors can then be modeled.

The structural model is a path diagram that specifies the structural relationships of the latent variables. This model is composed based upon a thorough review of the literature regarding the constructs of interest. The researcher can then test the relationships and contributions of latent variables. Crocket (2012) recommended using Bollen’s (1989) recursive rule and t rule to identify the structural model.

Model estimation. Crocket (2012) described this step as “[...] estimating the parameters of the theoretical model in such a way that the theoretical parameter values yield a covariance matrix as close as possible to the observed covariance matrix S ” (p. 38). Ultimately, the researcher determines the value and error of unknown parameters (Weston & Gore, 2006). Crocket identified maximum likelihood (ML) and generalized least squares (GLS) as the most commonly used fitting functions for this step. While GLS

is considered a more stringent method with non-normal data, ML is a more commonly used method with complex models and unequal group sizes (Kline, 2011).

Model testing. Crocket (2012) recommended, “Multiple indices of fit (i.e., absolute, comparative, and parsimonious) should be analyzed to determine the degree to which the theoretical model fits the sample data” (p. 34). Based on guidelines for determining model fit for (a) global fit and (b) individual model parameters fit, the measurement and structural models are analyzed for goodness-of-fit using the Chi-square statistic to achieve non-significance, and standalone fit indices for the model (e.g., Comparative Fit Index [CFI]; Root Mean Squared Error of Approximation [RMSEA]; and Tucker-Lewis Index [TLI]; Fan & Sivo, 2005; Hu & Bentler, 1999). Table 5 presents a description of the fit indices.

Table 5

Description of Fit Indices

Fit Indices	Description	Cutoff Criteria
Chi-Square (X^2)	Identifies the comparison between observed covariance matrix and predicted covariance matrix with the intention that the model predicts the matrix.	If X^2 is <i>not</i> significant, the model is acceptable. The ratio of X^2 to df should be ≤ 2 or 3.
Comparative Fit Index (CFI)	Identifies the comparison of the ratio between the discrepancy of the hypothesized model and the discrepancy of the alternative model. Specifically, CFI compares the covariance matrix to the X^2 of the hypothesized model to the X^2 of the null model. The alternate model results from the making latent variables and indicators uncorrelated.	$> .90$ is acceptable; ≥ 0.95 is a good fit.
Goodness of Fit Index (GFI)	Identifies the actual variance and covariance and is used as an alternative to chi-square.	$> .90$ is acceptable; ≥ 0.95 is a good fit.
Root Mean Squared Error of Approximation (RMSEA)	Identifies the amount of variance within the hypothesized model. RMSEA compares the fit of the independent model (<i>no</i> relationships between variables) to the estimated model. Sensitive to df and is stronger with fewer parameters.	.05 - .08 is acceptable; $\leq .05$ is a good fit.
Tucker-Lewis Index (TLI)	Compares the X^2 of the hypothesized model to the X^2 of the null model. TLI describes the degree to which a specified model performs better than a baseline model.	$> .90$ is acceptable; ≥ 0.95 is a good fit.

Chart adopted from Fan & Sivo, 2005; Hu & Bentler, 1999; MacCallum et al., 1996; Mullen, 2014; Sherrell, 2014

Model modification. In this step, the researcher makes modifications to the theoretical model to increase the goodness-of-fit between the model and the data (Schumacker & Lomax, 2010). The researcher adjusts the model by freeing or setting parameters (Weston & Gore, 2006). Despite SEM being a confirmatory practice, model modification is an exploratory procedure (Crockett, 2012).

Summary of steps in SEM

To summarize the steps involved in conducted SEM, the researcher (1) developed a theoretical model based on a thorough review and understanding of the literature regarding the constructs of interest, (2) used CFA to examine factor loadings and make adjustments to the measurement models, and (3) evaluated the structural model. To evaluate the structural model, the researcher evaluated (a) the signage (i.e., positive or negative values) and size of parameters, (b) the precision of the parameter estimates by reviewing the excessively large or small standard errors, and (c) the critical ratio, which must be greater than +/- 1.96 based on a probability level of .05 to reject the null hypothesis. Finally, the researcher reviewed the goodness-of-fit statistics (e.g., CFI, RMSEA, GFI, SRMR) and modified the model through freeing or setting parameters.

Exploratory Questions

The exploratory research questions in the study were examined using a variety of statistical analyses including (a) descriptive statistics, (b) Pearson Product-Moment Correlations, (c) Spearman Rank Order correlations (d) multiple regressions, (e) ANOVA, and (f) Independent-Samples T-Test. The researcher first examined the

descriptive statistics of the data to gain a more thorough understanding of the demographic information of the sample (Hair et al., 2010). When answering the exploratory research questions in the study, (see previous sections) the researcher conducted a series of Pearson Product-Moment and Spearman Rank Order Correlations (Pallant, 2010). To conduct bivariate correlations, the researcher first assessed the data for outliers by converting scores to Z-scores and examining cases exceeding +/- four standard deviations (Hair et al., 2010). After removing outliers belonging to participants of different populations (e.g., individuals greater than 29 years old), the researcher deemed outlier values to be valid (Osborne, 2013). The researcher also created scatterplots to assess the data for violation of the assumptions of linearity and homoscedasticity (Pallant, 2010).

When relationships were identified between constructs, the researcher conducted one-way ANOVA to examine differences in scores between groups of participants (Pallant, 2010). The data was *not* collected via a random sample, which violates an assumption necessary to conduct ANOVA (Pallant, 2010). Alas, “this is often not the case in real-life research,” (Pallant, 2013, p. 213). The researcher assessed the data for other assumptions necessary to conduct ANOVA including normal distribution and homogeneity of variance (Pallant, 2010). Overall, ANOVA is a robust procedure that can withstand violation of assumptions (Pallant, 2010).

The researcher also conducted MLR to determine if the sample’s demographic variables predicted the constructs of interest (i.e., outcome variables; Tabachnick & Fidell, 2013). Prior to conducting MLR and LR, the researcher determined that adequate

sample-size was achieved (e.g., more than 15 participants per predictor; Stevens, 1996). Furthermore, outliers were addressed (Hair et al., 2010), and the researcher assessed for the data to ensure that assumptions of multicollinearity and singularity, normality, linearity, homoscedasticity, and independence of residuals were addressed as well (Pallant, 2010).

Dependent and Independent Variables

This investigation included multiple dependent and independent variables. In SEM, dependent variables are also known as endogenous variables, and independent variables are also known as exogenous variables. Unique to SEM, constructs of interest can work as both endogenous and exogenous variables (Kline, 2011).

Dependent/Endogenous Variables

This study explored the contribution of emerging adults' intensity of online dating on empathy, objectification of others, and quality of relationships with romantic partners. Based on a thorough review of the literature, the researcher identified (a) empathy, (b) objectification of others, and (c) quality of relationships with romantic partners as the dependent variables as they were identified in the literature as constructs of interest with implications for counselors, counselor educators, and researchers (see chapter two).

1. Empathy was a latent variable represented by three manifest factors (a) *Affective Empathy*, (b) *Cognitive Empathy*, and (c) *Sympathy*. The researcher identified

empathy as a construct of interest due to its theoretical importance in the mental wellness and functioning of emerging adults (Siegel, 2010; 2013; Szalavitz & Perry, 2010), as discussed in chapter two.

2. Objectification of others was a latent variable represented by three anticipated manifest variables measuring the objectification of others. A thorough review of the literature identified objectification of others as a construct that is part of a cycle along with self-objectification and the internalization of cultural standards for beauty that are associated with issues related to well-being in emerging adults, as noted in chapter two.
3. Quality of relationships with romantic partners was also identified as a latent variable measured by three manifest variables of (a) *Avoidance*, (b) *Anxiety*, and (c) *Relationship Satisfaction*. The researcher selected the quality of relationships with romantic partners as a construct of interest, as these relationships are essential to emerging adults' well-being (Siegel, 2013; Szalavitz & Perry, 2010), as reviewed in chapter two.

Independent/Exogenous Variables

The researcher selected the independent/exogenous variables in this study based on a thorough review of the literature regarding the counseling implications associated with emerging adults' use of dating on their empathy, objectification of others, and quality of relationships with romantic partners.

1. The independent/exogenous variable of online dating (as measured by the ODI) was chosen as it theoretically (Siegel, 2010; 2013; Szalavitz & Perry, 2010) influences emerging adults' well-being, as reviewed in chapter two. The construct of online dating is measured by two anticipated factors of the ODI (a) *Intensity*, and (b) *Attitudes*.
2. Demographic variables were also included as independent variables, including (a) age, (b) gender, (c) race/ethnic classification, (d) college/university of enrollment, (e) year in college, (f) major area of study, (g) sexual orientation, (h) relationship status, (i) relationship goals, (j) quantity of online dating services used, and (k) online dating website or telephone application used. The researcher chose these demographic variables based on a review of the literature (see chapter two) in relation to emerging adults in college, and in order to represent variety in the sample.

Ethical Considerations

Ethical considerations were reviewed by the IRB and the researcher's dissertation committee included:

1. The confidentiality and anonymity of participant data.
2. Participation in the study was voluntary and did *not* impact students academically.
3. The researcher informed participants of their rights through informed consent (IRB approved) as research participants that included voluntary participation

and the opportunity to withdraw from the study without consequence or retribution.

4. The researcher received permission to use the instruments in this study as well as to manipulate them or to transfer them to an online format (i.e., Qualtrics).
5. The researcher conducted this study =with the permission and approval of the dissertation chairs, committee members, participating universities and colleges, and the IRB at the University of Central Florida.

Study Limitations

Despite the researcher's precautions taken to mitigate against threats to external, internal, and test validity, several limitations exist. First, correlational research cannot determine causality (Gall et al., 2007). Further, correlational research is vulnerable to threats to validity including the nature of self-report instruments, measurement error associated with instrumentation, ecological validity, and population validity.

Additionally, the utilization of convenient sampling is a limitation of this study, as the sample is not necessarily representative of the population of interest and potential researcher bias may have occurred. Also, the length of the data collection packet may have contributed to participant non-response or attrition rates. Lastly, the participants sampled may *not* have had experience with websites or applications being studied, thus limiting the usable sample data.

Nonetheless, the researcher attempted to mitigate against threats to validity by conducting a thorough and critical review of the literature regarding the instruments

utilized in this research study and comparing the psychometric properties of the instruments from the current study with the psychometric properties of the instruments reported in previous studies to establish similarities and differences. Thus, the researcher utilized instruments that have demonstrated strong validity and reliability with similar samples in comparable studies in order to promote the measurement of participants' variables with strong validity and reliability in this investigation. The researcher also collected participant demographic information and used it in the analysis to examine unique relationships between covariates and to examine and account for any unique relationships that may have influenced the dependent variables. Furthermore, the researcher accounted for participants' socially desirable response bias through the use of the MCSDS-FA (Reynolds, 1982).

Chapter Summary

This study investigated the contribution of emerging adults' intensity of online dating on their levels of empathy, objectification of others, and their quality of relationships with romantic partners. Chapter three presented the research methods employed in this research study, including (a) population and sampling procedures, (b) data collection methods, (c) measurement and instrumentation, (d) research design and method, (e) research hypothesis and questions, (f) data analysis methodology, (g) ethical considerations, and (h) study limitations. Furthermore, this chapter outlined the dependent and independent variables used in this study and reviewed ethical considerations and study limitations.

CHAPTER FOUR: RESULTS

In chapter four, the researcher presents the results of the research hypothesis and exploratory questions of this investigation. The purpose of this study was to investigate the directional relationship between emerging adults' use of online dating with their levels of empathy, objectification of others, and quality of relationships with romantic partners. This investigation tested the theoretical model that emerging adults' intensity of online dating (as measured by the *Online Dating Intensity Scale* [ODI]) contributed to their levels of empathy (as measured by the *Adolescent Measure of Empathy and Sympathy* [AMES; Vossen, Piotrowski, & Valkenburg, 2015), objectification of others (as measured by the *Sexual-Other Objectification Scale* [SOOS]), and quality of relationships with romantic partners (as measured by the *Relationships Structure Questionnaire* [ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011] and *Relationship Assessment Scale* [RAS; Hendrick, 1988]). Specifically, the researcher tested the hypothesized directional relationship that emerging adults with *greater* intensity of using online dating services (e.g., websites and applications) would have (a) *decreased* levels of empathy, (b) *increased* levels of objectification of others, and (c) *decreased* quality of relationships with romantic partners. Furthermore, the researcher investigated the relationship between emerging adults' demographic variables (e.g., age, gender, ethnicity, etc.) and the intensity of their use of online dating services, levels of empathy and objectification of others, and relationship quality with romantic partners.

The researcher utilized Structural Equation Modeling (SEM) to analyze the research hypothesis (Byrne, 2010; Kline, 2011; Schumacker & Lomax, 2010). The

researcher examined the exploratory research questions using (a) descriptive statistics, (b) Pearson's correlations, (c) Spearman Rank Order correlations, (d) multiple regressions, (e) ANOVA, and (f) Independent-Samples T-Test. The researcher presents the results in this chapter in the following order (a) sampling and data collection procedures, (b) initial descriptive statistics and data results, (c) data screening and statistical assumptions for SEM, (d) model specification and identification, (e) secondary analyses of descriptive statistics and statistical assumptions, and (f) data analysis of the research hypothesis and exploratory questions.

Sampling and Data Collection Procedures

Emerging adult (18-29 year olds) college students were the target population of this study. The current generation of emerging adults is the first generation raised with social communication technology (Best et al., 2014), and exploring their characteristics might exhibit the influence of SCT on relational constructs such as empathy and objectification of others. Thus, the researcher invited emerging adult undergraduate and master's level students between the ages of 18 and 29 enrolled at a college or university in the United States to participate in this study regardless of gender, race or ethnicity, or any other demographic variable.

The researcher employed convenience sampling and recruited potential participants through personal and professional contacts, including students from (a) East Carolina University, (b) Florida Gulf Coast University, (c) Rollins College, (d) Stetson University, (f) Georgia State University, (g) The University of Central Florida, (h)

University of North Carolina at Charlotte, (i) University of San Diego, and (j) Valencia College. Utilizing a diverse sample from schools throughout the United States provided geographic representation. The researcher used two recruitment methods including (a) web-based survey and (b) face-to-face administration, following Dillman and colleagues' (2009) *Tailored Design Method* (see Chapter 3).

Data collection for web-based survey distribution was initiated on September 3, 2015. Following Dillman and colleagues' (2009) *Tailor Design Method*, participants registered to UCF's Psychology department's (SONA) system viewed the title of the research study and followed a unique access link leading to the Qualtrics survey including (a) informed consent; (b) general demographic form; and (c) assessment instruments (e.g., AMES [Vossen et al., 2015]; ODI; SOOS; ECR-RS [Fraley et al., 2011]; RAS [Hendrick, 1988] and MCSDS-FA [Reynolds, 1982]). Participants who completed data collection items received .50 SONA credits. Data collection closed on November 1, 2015, allowing for an eight-week window of opportunity for potential participants to participate in this research study, as recommended by the researcher's faculty supervisor from the University of Central Florida's psychology department (personal communication with Dr. Jentsch, July 27, 2015).

Face-to-face data collection began September 10, 2015 and closed on November 1st, 2015, following a similar timeline as the online data collection period. The researcher scheduled dates with professors at various college and universities to collect data through undergraduate and master's level classrooms. The researcher selected colleges and universities for data collection based on size, demographic representation, and geographic

location in order to gain geographic diversity. When the primary researcher was logistically unavailable to distribute surveys (e.g., distributing surveys out of state location), the course instructor distributed data packets and returned them to the primary researcher. In other instances, the course instructor shared a link to an online survey of the data collection packets to students where students could choose to participate in the research study. The researcher accounted for potential duplication of responses by selecting classrooms for recruitment that were exclusive of one another. Specifically, the researcher invited students from courses that programmatically occur at different points in a student's course trajectory (e.g., introductory courses and advanced electives). Through the application of both online web-based survey and face-to-face administration, the researcher applied rigorous data collection procedures to support heterogeneity in the sample and geographic representation.

Initial Descriptive Statistics and Data Results

Prior to data analysis, the researcher explored the properties of the data. For example, the researcher examined response rates and demographic data, as well as participants' scores on the instruments used in this investigation. The following section begins with the initial descriptive data results and assessment of statistical assumptions.

Response Rate

An appropriate sample size in quantitative analysis is important to determine prior to data collection in order to account for population representation and statistical power

(Gall et al., 2007) and to account for participant response rates (Shih & Fan, 2009). The researcher anticipated and calculated non-response rates in order to achieve a minimum sample of over 500 completed data collection packets (Shih & Fan, 2009). The following section delineates response rates by web-based survey and face-to-face data collection.

Web-based survey. The researcher posted the research study on the University of Central Florida's Psychology department's SONA system. The SONA system hosts about 10,157 students (personal communication with Dr. Jentsch, July 28, 2015). While it would appear that 10,157 students can participate in the study, the SONA system limits successful participant recruitment (e.g., acceptance of informed consent, study completion) at 999 participants. The researcher acquired a total of 1,005 initial – yet incomplete – responses through the SONA system, which exceeded the low-end of the anticipated response of 200 participants (personal communication with Dr. Jentsch, July 28, 2015). Of the 1,005 responses, a few participants ($n = 8$) failed to accept the conditions of the informed consent and opted to not participate, resulting in 999 completed data packets. However, some participants who completed the assessment instruments did *not* meet criteria to be included in the study (e.g., older than 29 years of age). Thus, recruitment through UCF's SONA system resulted in 954 usable responses (94.9%).

Face-to-face data collection. In addition to web-based survey, the researcher invited 800 potential participants to complete face-to-face data packets. The researcher scheduled dates with professors at various colleges and universities to distribute survey packets in undergraduate and master's level classrooms. In some instances, the course

instructor distributed data collection packets to students and returned the packets to the researcher. Of 800 packets distributed, 663 packets were returned (82.88% response rate). Some packets returned were *not* completed, and some participants did *not* meet criteria to be included in the study (e.g., older than 29 years of age). Therefore, face-to-face data collection resulted in the acquisition of 623 usable responses (77.88%). The researcher suspects the lower than normal response rate (see Blount, 2015; Mullen, 2014) could be attributed to student absences on days that data collection took place. In addition to face-to-face data collection, some contacts of the researcher distributed a unique link to students to complete the data collection packet online (e.g., www.qualtrics.com). One hundred and five potential participants received an invitation to participate in the study in this way, but only 51 potential participants created responses online (48.57%). Some online surveys were *not* completed, and some participants did *not* meet criteria to be included in the study (e.g., older than 29 years of age). Therefore, online data collection resulted in the acquisition of 36 usable responses (34.29%).

Total usable response rate. The researcher distributed 800 data collection packets to potential participants and invited 105 potential participants to participate online. Additionally, 10,157 students had access to participate in the study using UCF's psychology department's SONA system. In combination, the researcher acquired 1,713 data packets. However, when considering response rates, the researcher considered the SONA system to host a pool of 999 potential participants, due to the limit on recruitment. Thus, with 999 successful data packets acquired through SONA, the distribution of 800 physical data packets, and the invitation of 105 potential participants to participate via

electronic survey, the researcher acquired a total response rate 89.97%. However, some participants ($n = 24$) did *not* complete any of the data collection instruments, and 76 participants were *not* part of the population being studied (e.g., older than 29 years of age); therefore, the researcher acquired a final sample size of 1,613 and a usable response rate of 84.72% (see Table 6), which is adequate to conduct SEM (Kline, 2011; Schumacker & Lomax, 2010).

Table 6

Sampling and Response Rates

	Participant Responses (N)	Participants Invited	Response Rate	Useable Response (n)	Usable Response Rate
Data Source					
SONA	1,005 ^a	999	100.60%	954	94.9%
Face-to-Face	663	800	82.88%	623	77.88%
Online	51	105	48.57%	36	34.29%
Total	1,719	1,904	90.28%	1,613	84.72%

Note. ^aThe SONA system hosts 10,157 students, however the system limits potential responses to 999 completed data packets. Thus the researcher considered response rates with the limitation of 999 potential responses. Thus the number of responses received exceeds the potential 999 participants allowed by the SONA website, even though the final sample recruited through SONA was limited to 999.

Participant Demographic Information

Data collection resulted in a final sample size of 1,613. The majority of participants identified themselves as female ($n = 1,116$; 69.2%) as opposed to male ($n = 483$; 29.9%), and five participants identified themselves as transgender (0.3%) while seven participants reported “other” (0.4%). Participants’ ages ranged from 18 ($n = 653$; 40.5%) to 29 ($n = 16$; 1.0%) with the average age of participants being 19.83 years. The

majority of participants identified as White ($n = 1,175$; 72.8%), while other participants reported that they were black ($n = 186$; 11.5%), multiracial ($n = 101$; 6.3%), Asian or Asian-American ($n = 89$; 5.5%), Native American ($n = 4$; 0.2%), Pacific-Islander ($n = 1$, 0.1%) or other ($n = 47$, 2.9%). Regarding ethnicity, the majority of participants identified as non-Hispanic ($n = 1,279$; 79.3%) compared to 313 participants who identified as Hispanic (19.4%).

Most participants were undergraduate students ($n = 1,447$; 89.82%) compared to master's level students ($n = 156$; 9.7%). Seven hundred and six participants reported that they were Freshman (43.8%), compared to participants who reported that they were sophomores ($n = 322$; 20.0%), juniors ($n = 253$; 15.7%) or seniors ($n = 166$; 10.3%). More information related to participants' reported school attendance and academic majors is presented in Table 7.

Participants identified their sexual orientation as heterosexual ($n = 1,457$; 90.3%), bisexual ($n = 69$, 4.3%), gay or lesbian ($n = 42$, 2.6%), and other ($n = 34$, 2.1%). The majority of participants reported that they were single ($n = 832$, 51.6%) compared to those who were in a relationship ($n = 534$; 33.1%), dating ($n = 121$; 7.5%), cohabiting ($n = 52$, 3.2%), engaged ($n = 26$; 1.6%), married/partnered ($n = 26$; 1.6%), separated ($n = 1$, 0.1%), divorced ($n = 2$, 0.1%), or identified as other ($n = 14$, 0.9%). When asked what participants are looking for in their current or next romantic relationship, the majority of participants reported that they were seeking a long-term relationship ($n = 1,189$; 73.7%), compared to a date ($n = 191$; 11.8%), a sexual encounter ($n = 119$, 7.4%) or a short-term relationship ($n = 98$; 6.1%). Most participants reported that they have *never* used online

dating services ($n = 1,096$; 67.9%), compared to 503 (31.18%) who have. Specifically, 139 participants (8.6%) reported that they currently use online dating services, whereas 246 participants (15.3%) reported that they have used online dating services in the last year, and 118 participants (7.3%) reported that they used online dating services more than one year ago. Most participants reported that they have only used one online dating service ($n = 342$; 21.2%), compared to participants who have used two services ($n = 106$; 6.6%), three services ($n = 40$; 2.5%), or four or more services ($n = 19$; 1.2%). More information regarding specific online dating services used is presented in Table 7.

Table 7

Participants' Demographic Characteristics

Characteristic	<i>n</i>	Total percent
Gender		
Female	1,116	69.2
Male	483	29.9
Transgender	5	0.3
Other	7	0.4
Ethnicity		
Non-Hispanic	1,279	79.3
Hispanic	313	19.4
Race		
White	1,175	72.8
Black	186	11.5
Multiracial	101	6.3
Asian/Asian-American	89	5.5
Native American	4	0.2
Pacific-Islander	1	0.1
Other	47	2.9
Age		
18	653	40.5
19	347	21.5
20	154	9.5
21	136	8.4
22	98	6.1

23	71	4.4
24	48	3.0
25	21	1.3
26	30	1.9
27	12	0.7
28	16	1.0
29	16	1.0
School Attendance		
University of Central Florida	1,155	71.6
Florida Gulf Coast University	340	21.1
East Carolina University	53	3.3
University of North Carolina-Charlotte	36	2.2
Rollins College	10	0.6
University of San Diego	9	0.6
Stetson University	7	0.4
Georgia State University	2	0.1
Valencia College	1	0.1
Major/Area of Study		
Communications	168	10.4
Psychology	143	8.9
Nursing	128	7.9
Athletic Training	117	7.3
Clinical Mental Health Counseling	117	7.3
Biomedical Sciences	93	5.8
Education	84	5.2
Engineering	79	4.9
Business	67	4.2
Undeclared	66	4.1
Biology	62	3.8
Computer Science	49	3.0
Hospitality	36	2.2
Information Technology	27	1.7
Marketing	24	1.5
Marriage and Family Therapy	24	1.5
Criminal Justice	21	1.3
Finance	20	1.2
Political Science	18	1.1
Accounting	17	1.1
Art	15	0.9
School Counseling	14	0.9
Theatre	14	0.9
Pre-Clinical Health Science	13	0.8
Digital Media	10	0.6
Advertisement and Public Relations	9	0.6

Forensic Studies	9	0.6
Radio, TV, Broadcasting	9	0.6
Mathematics	9	0.6
Economics	8	0.5
Journalism	8	0.5
Social Work	8	0.5
English & Language Arts	7	0.4
Environmental Science	7	0.4
Legal Studies	7	0.4
Event Management	6	0.4
Interdisciplinary Science	6	0.4
Sociology	6	0.4
Other	71	4.4
Sexual Orientation		
Heterosexual	1,457	90.3
Bisexual	69	4.3
Gay or lesbian	42	2.6
Other	34	2.1
Relationship Status		
Single	832	51.6
In a relationship	534	33.1
Dating	121	7.5
Cohabiting	52	3.2
Engaged	26	1.6
Married/Partnered	26	1.6
Divorced	2	0.1
Separated	1	0.1
Other	14	0.9
Relationship Goal		
A long-term relationship	1,189	73.7
A date	191	11.8
A sexual encounter	119	7.4
A short-term relationship	98	6.1
Online Dating Status		
Never used online dating	1,096	67.9
Used in the last year	246	15.3
Currently use online dating	139	8.6
Used over a year ago	118	7.3
Number of Dating Services used		
1 service	342	21.2
2 services	106	6.6
3 services	40	2.5
4 or more services	19	1.2

Dating Sites Used		
Tinder	416	82.70
OKCupid	76	15.11
Plenty of Fish	57	11.33
Match.com	25	4.97
Grindr	24	4.77
Badoo	17	3.40
eHarmony	17	3.40
Zoosk	16	3.18
Coffee Meets Bagel	13	2.58
Christian Mingle	8	1.59
Hinge	8	1.59
JDate	5	0.99
Date Hook Up	3	0.6
Down	3	0.6
How About We	3	0.6
Love Flutter	0	0
Other	48	9.54

Online Dating

In this investigation, the researcher defined online dating as use of any Internet website or cellular telephone application where an individual can create a profile and contact others as potential romantic partners for the purpose of sexual activity, dating, or forming romantic relationships. Due to a deficit of empirically validated instruments designed to measure this construct, the researcher modified the *Facebook Intensity Scale* (Ellison et al., 2007) to measure online dating use, which resulted in the creation of the *Online Dating Inventory* (ODI). The researcher altered items to measure specific activities of online daters in quantity, frequency, and duration (see Chapter 3). The modifications to the FBI resulted in a 10-item instrument on a 5-point Likert scale (see Appendix J). Scores are obtained by calculating a participant's mean score per factor (e.g., *Attitudes, Intensity*).

The researcher calculated internal consistency reliability with the initial data (e.g., prior to data cleaning or CFA). Cronbach's α for the entire ODI (10 items) was .815 ($n = 494$). Cronbach's α for the *Attitudes* subscale (items 1-3; $n = 504$) was .801 and Cronbach's α for the *Intensity* subscale (items 4-10; $n = 497$) was .713, which was appropriate (Hair et al., 2006). In combination, these internal consistency scores provide support for the use of the subscale scores of the ODI. Measures of central tendency for the ODI with this data are presented in Table 8.

Table 8

ODI Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
Attitudes ^a	1.88	.93	4	1.67	1
Intensity ^b	1.61	.60	3.57	1.43	1
<i>Total Score</i> ^c	1.7	0.63	3.70	1.5	1

Note. ^a $n = 504$. ^b $n = 497$. ^c $n = 494$.

Empathy

Empathy relates to an individual's understanding of another individual's thoughts and feelings in a situational context (Rogers, 1980) and has cognitive and affective components (Davis, 1983). Cognitive empathy is the understanding of another person's emotions, whereas affective empathy is the emotional experience of another person's emotions (Vossen et al., 2015). In contrast, sympathy is understanding another person's emotional experience without feeling it (Szalavitz & Perry, 2010). Multiple assessments exist to measure empathy, but each is limited by several shortcomings (see chapter 3). Therefore, the researcher utilized the *Adolescent Measure of Empathy and Sympathy* (AMES; Vossen et al., 2015), which was designed to address the limitations of other

measurements of empathy. The AMES is a 12-item empathy assessment with three factors consisting four items per factor (a) *Cognitive Empathy*, (b) *Affective Empathy*, and (c) *Sympathy*. Participants respond to each item on a 5-point Likert scale ranging from (1) never, (2) almost never, (3) sometimes, (4) often, and (5) always. *Affective Empathy* scores are calculated by averaging items 5, 7, 9, and 12; *Cognitive Empathy* scores are calculated by averaging items 1, 3, 8, and 10; and *Sympathy* scores are calculated by averaging items 2, 4, 6, and 11.

The initial examination of the internal consistency for the entire AMES was acceptable ($\alpha = .822$; $n = 1,598$). Cronbach's α for the *Affective Empathy* subscale (items 5, 7, 9, and 12; $n = 1,605$) was .791, Cronbach's α for the *Cognitive Empathy* subscale (items 1, 3, 8, and 10; $n = 1,611$) was .787, and Cronbach's α for the *Sympathy* subscale (items 2, 4, 6, and 11; $n = 1,607$) was .708, all of which indicated acceptable internal consistency (Hair et al., 2006). Measures of central tendency for the AMES with this data are presented in Table 9.

Table 9

AMES Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
<i>Affective Empathy</i> ^a	3.16	0.75	4	3	3
<i>Cognitive Empathy</i> ^b	3.82	0.59	4	3.75	4
<i>Sympathy</i> ^c	4.3	0.6	4	4.5	5
<i>Total Score</i> ^d	3.76	0.49	4	3.75	3.75

Note. ^a $n = 1,605$. ^b $n = 1,611$. ^c $n = 1,607$. ^d $n = 1,598$.

Objectification of Others

Objectification is the dehumanization of a person and instead experiencing him or her as an object (Heflick & Goldberg, 2014). Thus, the objectification of others, or “other-objectification,” is a “[...] perceivers’ tendency to attribute more importance to visible, appearance-related body features ... than to non-visible, competence-related body features” (Piccoli, Cobey, & Carnaghi, 2014, p. 45). The objectification of others is a new construct that was identified as an important phenomenon in the cycle of objectification (Fredrickson & Roberts, 1997; Strelan & Hargreaves, 2005). However, few instruments measure the construct of other-objectification. Therefore, the researcher modified an instrument created by two students at Illinois Wesleyan University (see Curran, 2004; Zolot, 2003) now called the *Sexual-Other Objectification Scale* (see chapter 3).

The SOOS is a 12-item assessment that uses a 6-point Likert scale with three anticipated factors (a) *Internalized Sexual Objectification* (items 1, 2, 5, 9, and 11), (b) *Disempathy and Commenting About Individuals’ Bodies* (items 4, 6, 8, and 10), and (c) *Insulting Unattractive People* (items 3, 7, and 12). The initial internal consistency for the entire SOOS ($\alpha = .835$; $n = 1,584$) and the *Internalized Sexual Objectification* scale (items 1, 2, 5, 9, and 11; $\alpha = .805$; $n = 1,603$) were both acceptable. However, the internal consistency for the *Disempathy and Commenting About Individuals’ Bodies* scale (items 4, 6, 8, and 10; $n = 1,602$) was .610, and Cronbach’s α for the *Insulting Unattractive People* scale (items 3, 7, and 12; $n = 1,605$) was .607, both of which are questionable with these data (Hair et al., 2006). Measures of central tendency for the SOOS with these data are presented in Table 10.

Table 10

SOOS Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
Subscale 1 ^a	3.9	1.04	5	4	4.2
Subscale 2 ^b	3.08	0.93	5	3	3.5
Subscale 3 ^c	3.97	1.06	5	4	4
<i>Total Score</i> ^d	3.64	0.83	4.83	3.67	3.5

Note. ^a *Internalized Sexual Objectification* scale; *n* = 1,603. ^b *Disempathy and Commenting About Individuals' Bodies* scale; *n* = 1,602. ^c *Insulting Unattractive People* scale; *n* = 1,605. ^d *n* = 1,584.

Quality of Romantic Relationships

The researcher utilized the *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) and the *Relationship Assessment Scale* (Hendrick, 1988) to measure quality of romantic relationships. In this investigation, romantic relationship quality is determined by relationship satisfaction (as measured by the RAS [Hendrick, 1988]) and attachment style (e.g., *secure, anxious, avoidant*; Pistole, 1989), where attachment style can be used to draw inferences about an individual's level of commitment, trust, relationship satisfaction, and emotional experiences in their relationship (Simpson, 1990). The following section delineates internal consistency reliability and measures of central tendencies for both the RAS (Hendrick, 1988) and ECR-RS (Fraley et al., 2011).

Relationship Structure Questionnaire (ECR-RS). Fraley and colleagues (2011) designed The *Relationship Structure Questionnaire* (ECR-RS) to measure an individual's attachment style. The ECR-RS is a 9-item questionnaire with two factors (i.e., *Anxiety, Avoidance*). Participants complete the nine items on a 7-point Likert scale with values ranging from "strongly disagree" to "strongly agree." Scores can be calculated per first

reverse coding items one, two, three, and four, and then calculating an average for each factor score. Specifically, items one through six are averaged for the *Anxiety* subscale, and items seven through nine are averaged for the *Avoidance* subscale.

Initial examination of Cronbach’s α for the entire ECR-RS (nine items; $n = 1,601$) was .845, which is acceptable (Hair et al., 2006). Internal consistency for the *Anxiety* subscale was also acceptable with a Cronbach’s α of .858 (items 1-6; $n = 1,604$), and internal consistency for the *Avoidance* subscale was high with a Cronbach’s α of .901 (items 7-9; $n = 1,609$). Measures of central tendency for the ECR-RS with these data are presented in Table 11.

Table 11

ECR-RS Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
<i>Anxiety</i> ^a	2.14	1.03	6	2	1
<i>Avoidance</i> ^b	3.45	1.8	6	3.33	1
<i>Total Score</i> ^c	2.58	1.05	5.78	2.56	1

Note. ^a $n = 1,604$. ^b $n = 1,609$. ^c $n = 1,601$.

Relationship Assessment Scale (RAS). The *Relationship Assessment Scale* measures relationship satisfaction in a variety of close relationships (Hendrick, 1988). The RAS is a 7-item instrument with a 5-point Likert scale where “1” represents low levels of relationship satisfaction and “5” represents high levels of relationship satisfaction. Due to the nature of the items on the assessment, the response for each item varies (see appendix I). The RAS is a one-factor instrument that utilizes a composite score. To score the instrument, items 4 and 7 are reverse coded and item totals are averaged. It is necessary to note that the RAS assumes that a participant is in a

relationship. However, because that assumption might be incorrect for some of the participants of this investigation, participants were asked to complete the assessment in regards to a previous relationship ($n = 545$, 33.8%), a current relationship ($n = 765$, 47.4%), or a potential future relationship ($n = 291$, 18.0%). The initial Cronbach's α for the entire RAS (seven items; $n = 1,599$) was .889, which is acceptable (Hair et al., 2006). Measures of central tendency for the RAS with these data are presented in Table 12.

Table 12

RAS Measures of Central Tendencies

Scale	Mean (M)	SD	Range	Mdn	Mode
<i>RAS Total Score^c</i>	3.85	.92	4	2.85	5

Note. ^a $n = 1,599$.

Social Desirability

The researcher employed a short-form of the *Marlowe-Crowne Social Desirability Scale* (MCSDS; Crowne & Marlowe, 1960) to account for possible response-bias and to promote internal validity (Reynolds, 1982). The MCSDS is a popular instrument and has been used in over 700 research investigations (Barger, 2002). However, due to the length of the instrument, researchers have also created multiple short forms of the assessment (Reynolds, 1982; Strahan & Gerbasi, 1972). Of all of the short forms available, the researcher deemed Reynolds's Form A (MCSDS-FA; 1982) to be the most efficient version (e.g., fewest items, strong psychometric properties).

The MCSDS-FA is a one-factor assessment that offers a composite score indicating a participant's level of social desirability. The assessment contains 11 true-false items. A participant is scored 1 point for every "true" response to items 3, 5, 7, 8,

and 11, and 1 point for every “false” response to items 1, 2, 4, 6, 9, and 10. Participants with higher scores on the assessment are determined to be responding to items in a socially desirable way rather than a truthful way. Initial Cronbach’s α for the entire MCSDS-FA (11 items; $n=1,595$) was .620, which indicates questionable internal consistency reliability (Hair et al., 2006). Measures of central tendency for the MCSDS-FA with these data are presented in Table 13.

Table 13

MCSDS-FA Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
<i>MCSDS-FA Total Score^c</i>	5.48	2.38	11.0	6.0	6

Note. ^a $n = 1,595$.

Data Screening and Statistical Assumptions for SEM

This investigation examined the influence of online dating on emerging adults’ levels of empathy, objectification of others, and quality of romantic relationships. In the following section, the author reviews the resulting data analyses for the primary and exploratory research questions. The researcher analyzed the data using the *Statistical Package for the Social Science* (SPSS, Version 21) and the *Analysis of Moment Structures* (AMOS, Version 21). The researcher employed the following statistical analyses in this examination, (a) SEM, (b) descriptive statistics, (c) Pearson’s correlations, (d) Spearman Rank Order correlations, (e) multiple regressions, (f) ANOVA, and (g) Independent-Samples T-Test. The researcher also utilized Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to conduct SEM. To

conduct SEM, the researcher employed the following five steps: (a) Model Specification, (b) Model Identification, (c) Model Estimation, (d) Model Testing, and (e) Model Modification.

Assumptions for SEM

It is necessary to screen data to assure that statistical assumptions are met in order to conduct quantitative analyses (Hair et al., 2006; Osborne, 2013). The researcher screened the data to address the following conditions (a) adequate sample size, (b) missing data, (c) outliers, (d) univariate and multivariate normality, (e) multicollinearity, (f) linearity between variables, and (g) homoscedasticity. Upon completion of data cleaning, the researcher reanalyzed the characteristics of the data.

Sample size. While *no* single agreed upon best practices has been established regarding minimum sample size necessary for SEM (Quintana & Maxwell, 1999; Raykov & Marcoulides, 2006); a minimum sample size of *at least* 200 participants is recommended for SEM (Kline, 2011). It is necessary to anticipate sample size in order to avoid making a Type II error (i.e., failing to reject a false null hypothesis; Balkin & Sheperis, 2011). Schumaker and Lomax (2010) recommended using www.Danielsoper.com (sample size calculator) to calculate *a priori* sample size for SEM. Based on this website, a minimum sample size of 640 was required to identify a small effect size (0.1) at a high power (.8) with four latent variables and 11 manifest variables at the probability of $p < .01$. However, to identify a small effect size (0.1) at a high power (.8) with four latent variables and 11 manifest variables at the probability of $p < .05$, a

sample size of 387 was needed. Therefore, with a final sample size of 1,613, the researcher acquired an adequate sample size to conduct SEM (Quintana & Maxwell; Raykov & Marcoulides, 2006; Schumacker & Lomax, 2010). Furthermore, 507 participants identified as having used online dating currently or in the past, which is a large enough subsample (e.g., > 387) to conduct SEM to identify a small effect size (0.1) at a high power (.8) with four latent variables and 11 manifest variables at the probability of $p < .05$.

Missing data. Missing data can occur in a dataset for a variety of reasons whether attributed to researcher error, software issues, or participants' attrition (Kline, 2011). It is necessary to assess the severity of missing data as it can reduce sample size or skew data results (Hair et al., 2006; Osborne, 2013). In order to maintain the largest set of data related to the constructs of interest, the researcher assessed the presence of missing data across the main constructs of interest (e.g., online dating, empathy, objectification of others, quality of romantic relationships), and *not* demographic (Hair et al., 2006; Osborne, 2013). Of the 1,613 completed data packets and 50 possible item responses related to each construct of interest, 41 construct-related items contained missing data. Specifically, 17 items were missing one case (e.g., participant response), 12 items were missing two cases, seven items were missing three cases, two items were missing four cases, one item was missing five cases, another one item was missing six cases, and a final item was missing seven cases. In total, 88 participant responses were missing from the entire data set with no more than seven missing cases from one item in particular.

Thus, the completed data packets contained 69,692 of 69,780 possible responses and was determined to be 99.87% complete.

No defined rules exist for how to handle missing data, and researchers recommend following “best practices” (Osborne, 2013, p. 2). Kline (2011) stated, “A few missing values, such as less than 5% on a single variable [e.g., construct of interest], in a large sample may be of little concern” (p. 55), as is the case with these data. Because *no* single test can determine the existence of data missing at random (MAR) or missing completely at random (MCAR), Kline (2011) recommended examining the data for patterns of loss. A visual review of the data across variables failed to find any patterns of loss or attrition, and missing values were determined to be MCAR (personal communication with Dr. Xu, December 2, 2015).

Schumacker and Lomax (2010) identified three primary ways to handle missing data (a) listwise deletion, (b) pairwise deletion, and (c) replacing missing values. As it relates to these data, Osborne (2013) recommended, “[...] mean substitution under MCAR appears to be less desirable than case deletion” (p. 119). Researchers recommended against the use of Listwise deletion, as it reduces sample size, and researchers cautioned against the use of pairwise deletion when it may create severely unequal sample sizes (Osborne, 2013; Schumacker & Lomax, 2010). Prior to employing a method to address missing data, it is necessary to note the statistical analyses being conducted (Tabachnick & Fidell, 2013). As it relates to this investigation, because of the robust size of these data in and the minimal amount of missing data, pairwise deletion was deemed to be best practice with these data to conduct CFA and EFA (personal

communication with Dr. Xu, December 2nd, 2015). Thus, sample sizes varied throughout analyses. For SEM analyses, the researcher employed Maximum Likelihood (ML) estimation, which is the default method of AMOS and produces “[...] the least bias” (Byrne, 2010, p. 359).

Outliers. Outliers are influential data points that “[...] are extreme or atypical on either the independent (X variables) or dependent (Y variables) variables or both” (Schumacker & Lomax, 2010, p. 27). To determine the presence of outliers, the researcher converted case responses to standardized z-scores and assessed for values that exceeded four standard deviations from the mean (Hair et al., 2006). Through this assessment method, the researcher identified 39 item responses (0.77% of responses) on the ODI that exceeded 4 standard deviations, compared to 0 item responses on the SOOS, 14 item responses on the AMES (0.08%), 31 item responses on the ECR-RS (0.21%), and 0 item response on the RAS.

Osborne (2013) identified six reasons that might account for the presence of outliers, (a) data entry errors, (b) intentional or motivated misreporting, (c) sampling error or bias, (d) standardization failure, (e) faulty distributional assumptions, and (f) legitimate cases sampled from the correct population. Regarding data entry error, the researcher assessed for values that appeared to be the result of mistyping (e.g., typing 66 rather than 6 for an item response), and found that all values fell within the Likert-score range. The researcher measured social desirability of responses with the MCSDS-FA to account for intentional or motivated misreporting and identified the data as *not* being the result of social desirability ($M = 5.48$). Regarding sampling error – the measurement of

individuals outside the population of interest – the researcher identified 74 cases in which participants were *not* emerging adults (e.g., older than age 29), and these cases were removed. The researcher attempted to account for standardization failure by gathering diverse samples, attaining geographic and academic diversity in the sample, and by standardizing data collection through two means (e.g., face-to-face data collection, www.qualtrics.com). Regarding distributional assumptions, Osborne (2013) suggested “[...] better interpretation might be that the data should *not* be expected to be normally distributed” (p. 147), as may be the case with these data. Furthermore, Osborne (2013) argued, “As a researcher casts a wider net and the data set becomes larger, the more the sample resembles the population from which it was drawn, and thus the likelihood of legitimate extreme values, becomes greater” (pp. 148-149). Therefore, the researcher took precaution against outliers that were inaccurate or misrepresented data, and deemed the presence of outliers in the sample as legitimate values that should not be removed. Regarding the presence of outliers, Osborne (2013) advocated for *not* removing legitimate scores in order to minimize sample reduction. Therefore, to maintain consistency in the data and to promote fidelity to the recorded values, outlier scores for the ODI and other assessment instruments were maintained (personal communication with Dr. Xu, December 2, 2015). Nonetheless, “[...] it is important to deal with the extreme score in some way, such as through transformation or a recoding/truncation strategy to both keep the individual in the data set and at the same time minimize the harm to statistical inference” (Osborne, 2013, p. 149). Therefore, the researcher performed a variety of transformations (e.g., Square root, Logarithmic, Inverse on the

data to mitigate against the influence of extreme scores and non-normal data [see Table 15]).

Univariate and multivariate normality. Multivariate statistics require data to be distributed normally (e.g., bell-shaped curve) in order to produce valid results (Hair et al., 2006). The researcher assessed for normality by visually inspecting Q-Q plots and histograms (Tabachnick & Fidell, 2013) and observed positively and negatively skewed distributions with leptokurtic patterns (see figures 13-34). Furthermore, the researcher conducted a Shapiro-Wilk *W* test and identified statistically significant levels of non-normality with these data (see Table 14). Therefore, the researcher determined non-normal distribution of data.

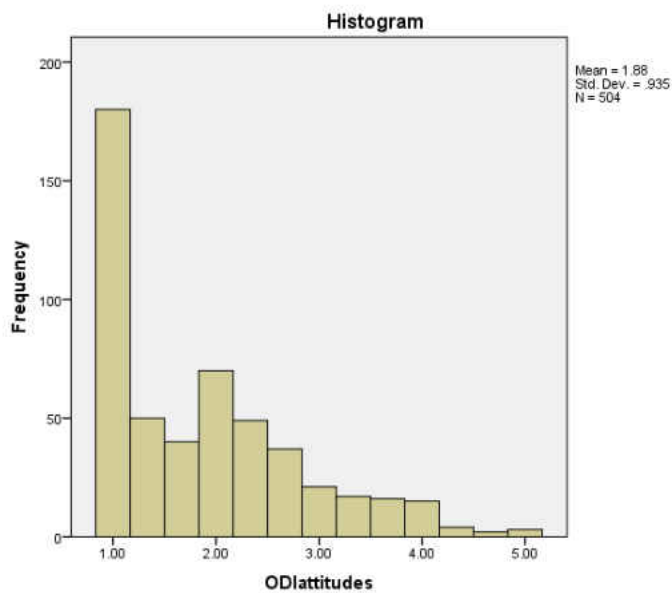


Figure 13: Histogram ODI - Attitudes

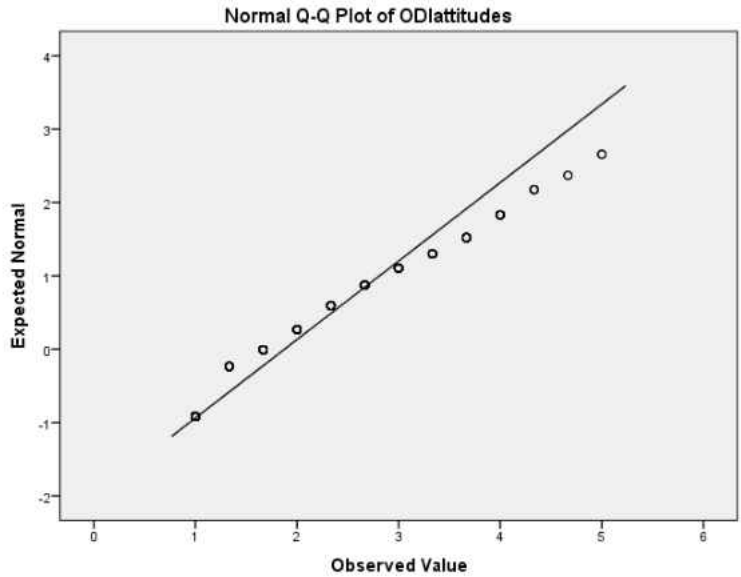


Figure 14: Normal Q-Q plot of ODI - Attitudes

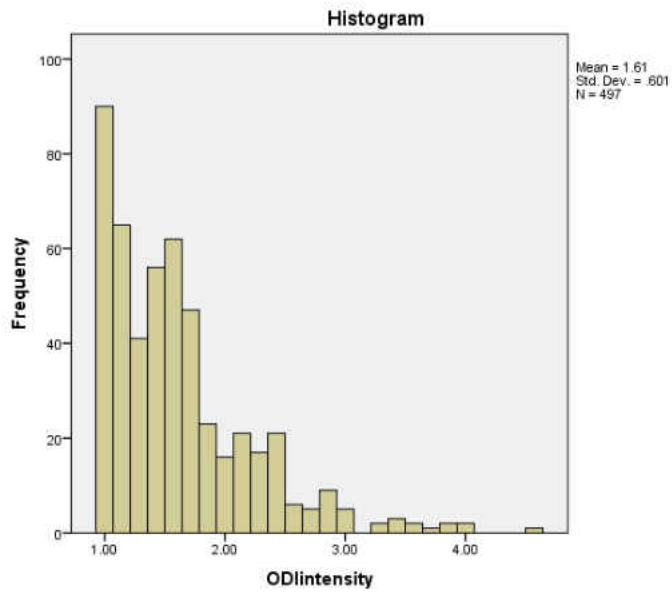


Figure 15: Histogram ODI - Intensity

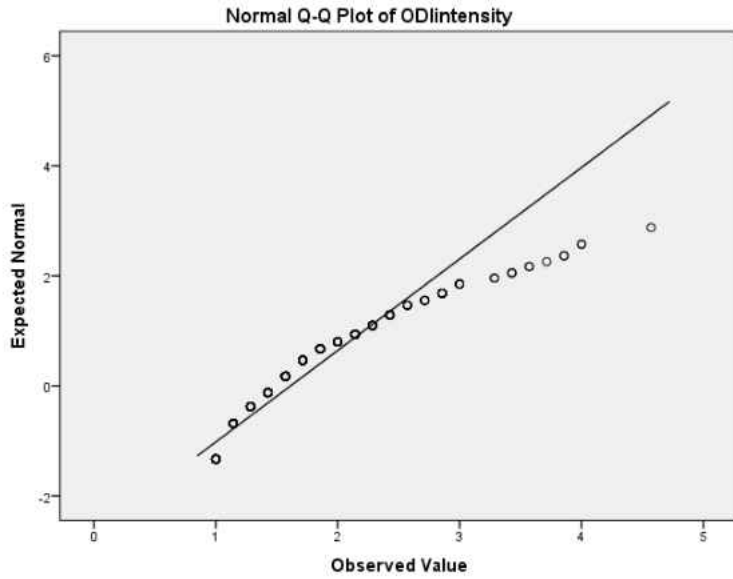


Figure 16: Normal Q-Q plot of ODI - Intensity

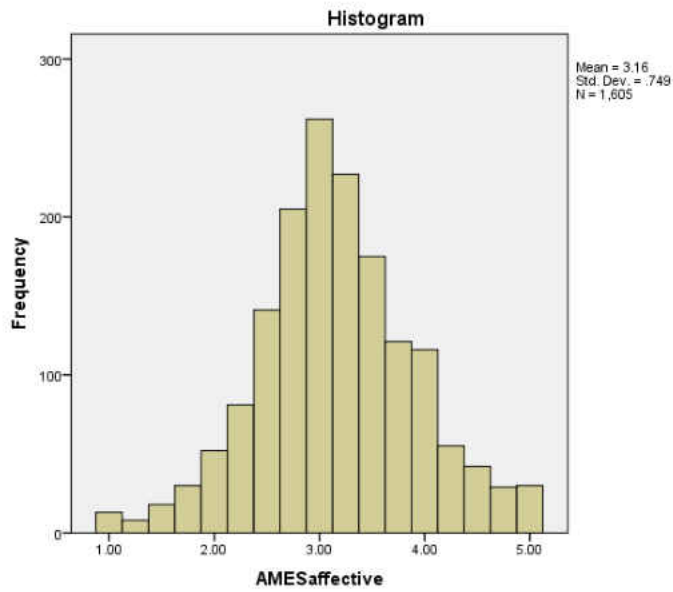


Figure 17: Histogram AMES - Affective Empathy

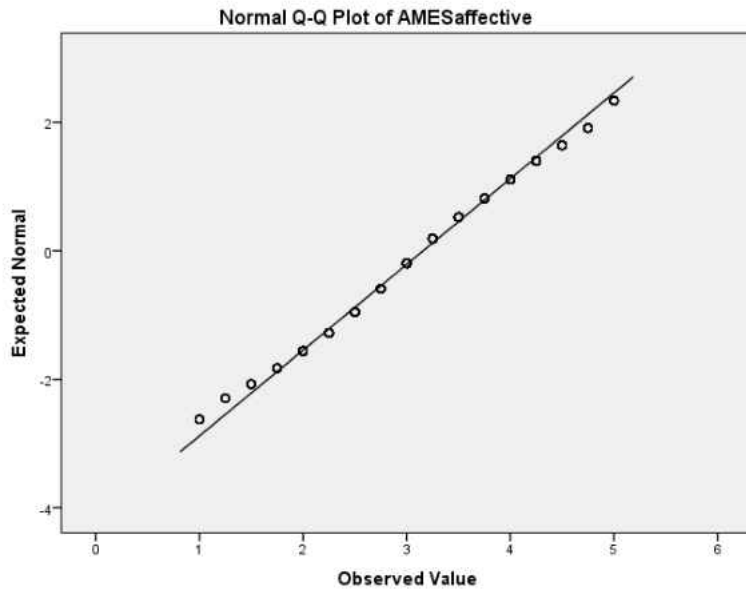


Figure 18: Normal Q-Q plot of AMES - Affective Empathy

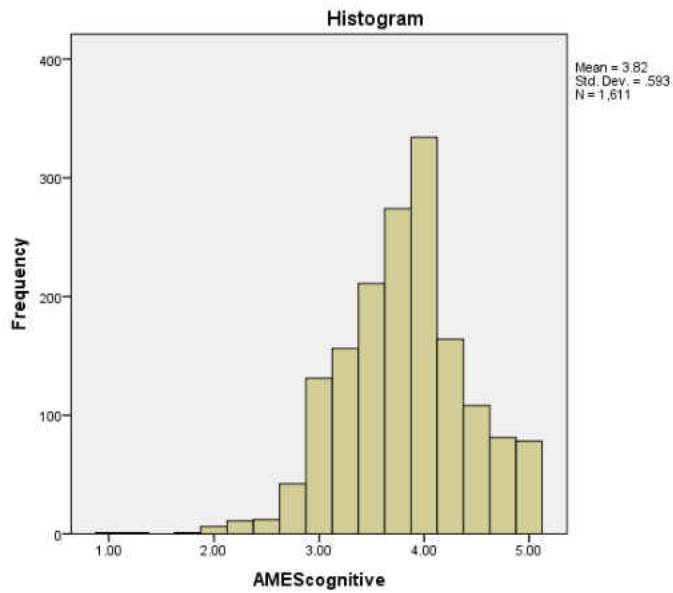


Figure 19: Histogram AMES - Cognitive Empathy

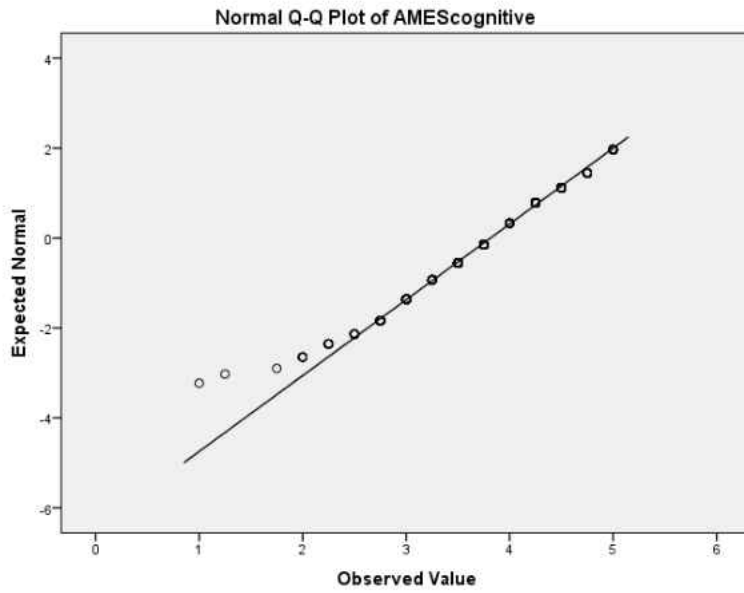


Figure 20: Normal Q-Q plot of AMES - Cognitive Empathy

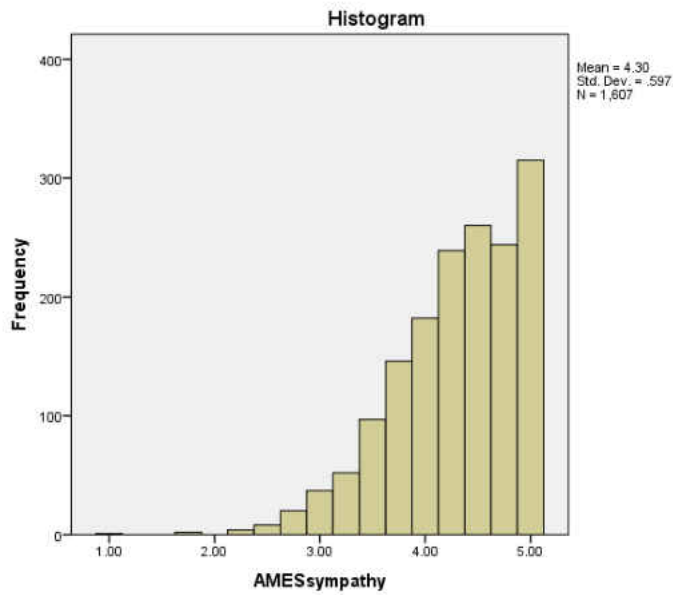


Figure 21: Histogram AMES - Sympathy

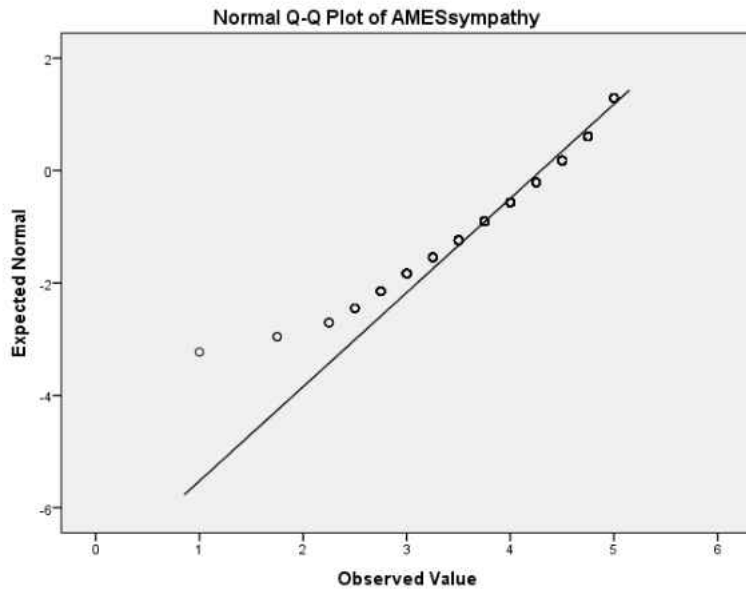


Figure 22: Normal Q-Q plot of AMES - Sympathy

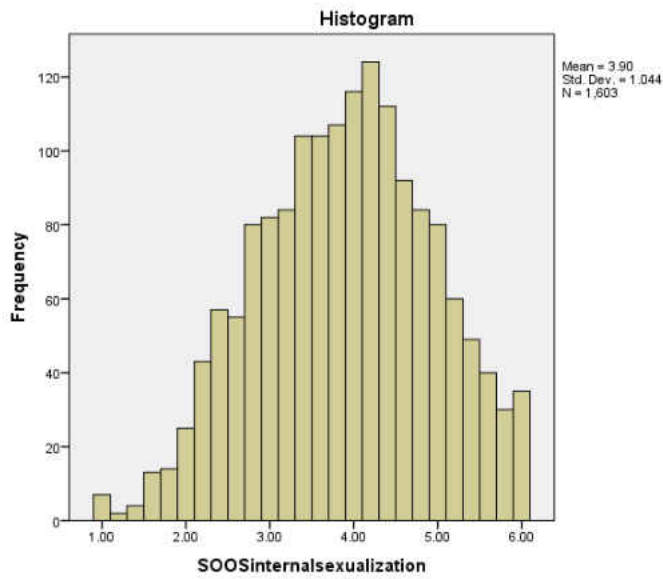


Figure 23: Histogram SOS 1

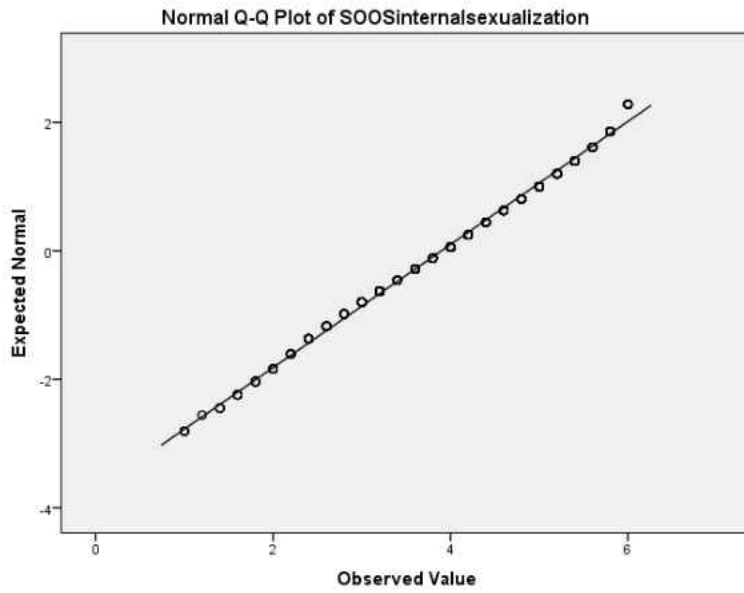


Figure 24: Normal Q-Q plot of SOS 1

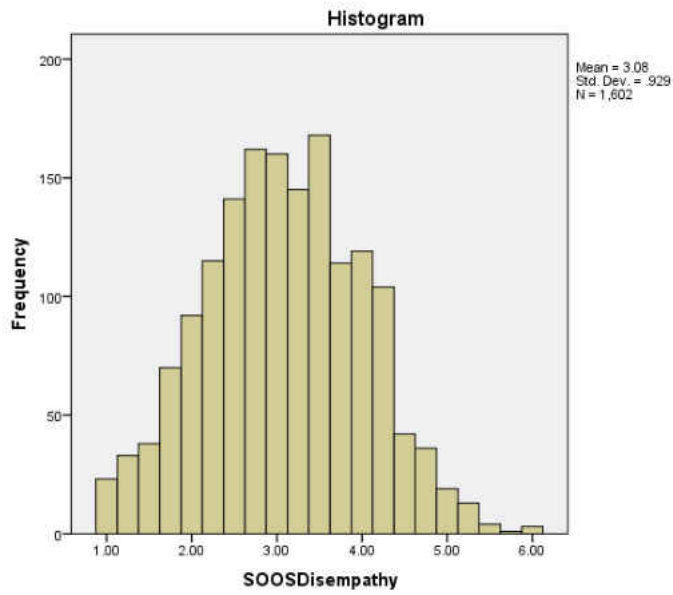


Figure 25: Histogram SOS 2

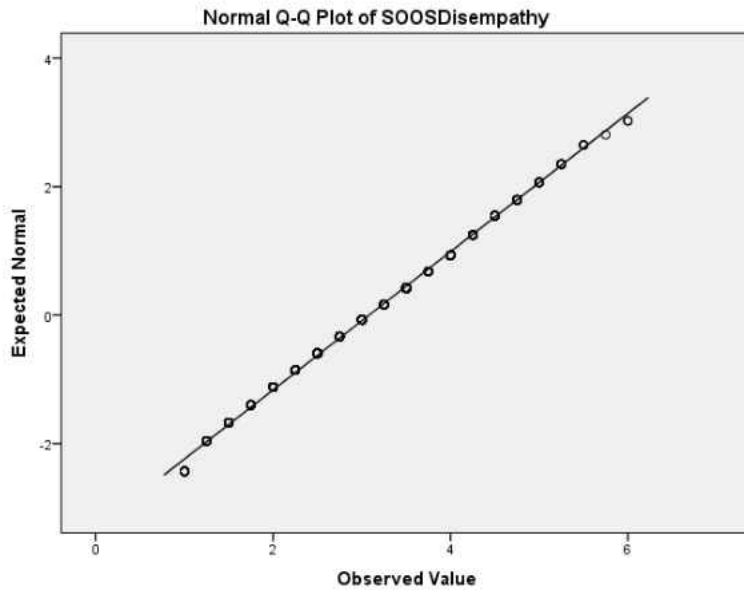


Figure 26: Normal Q-Q plot of SOS-2

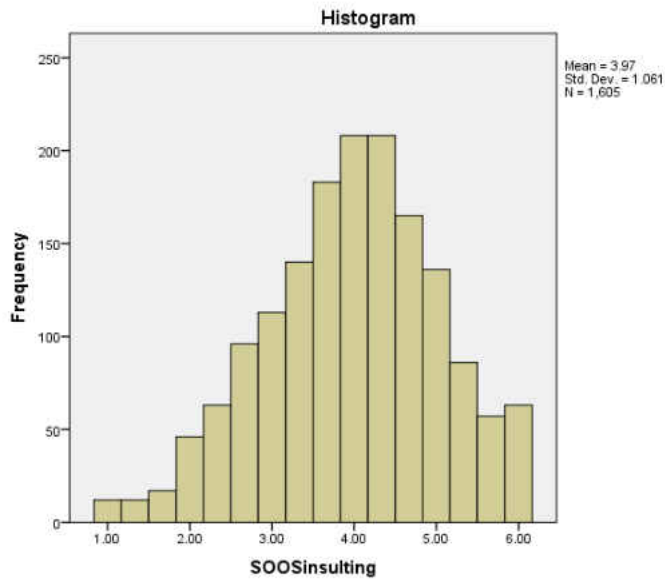


Figure 27: Histogram SOS 3

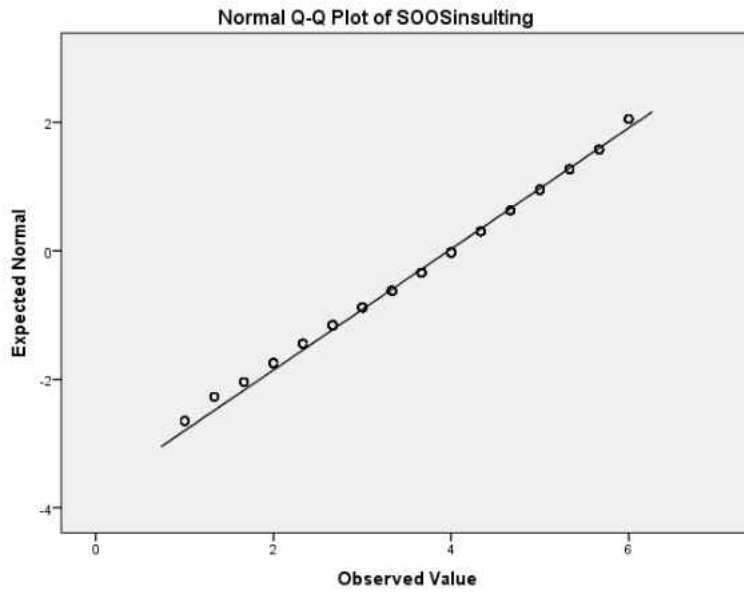


Figure 28: Normal Q-Q plot of SOS 3

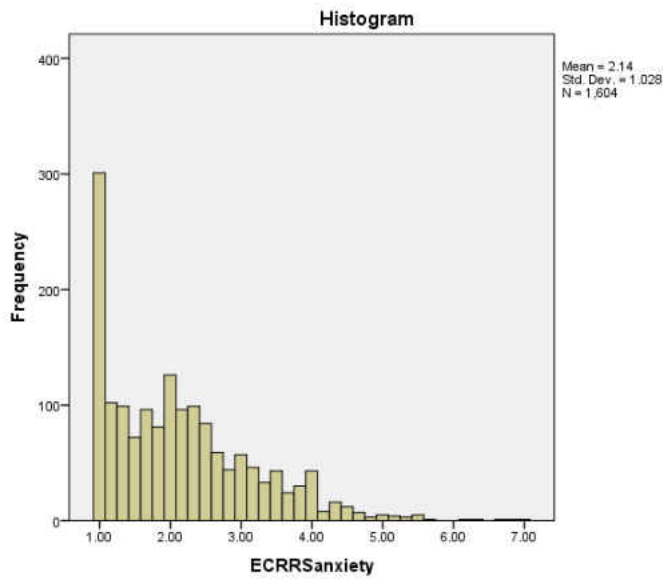


Figure 29: Histogram ECR-RS - Anxiety

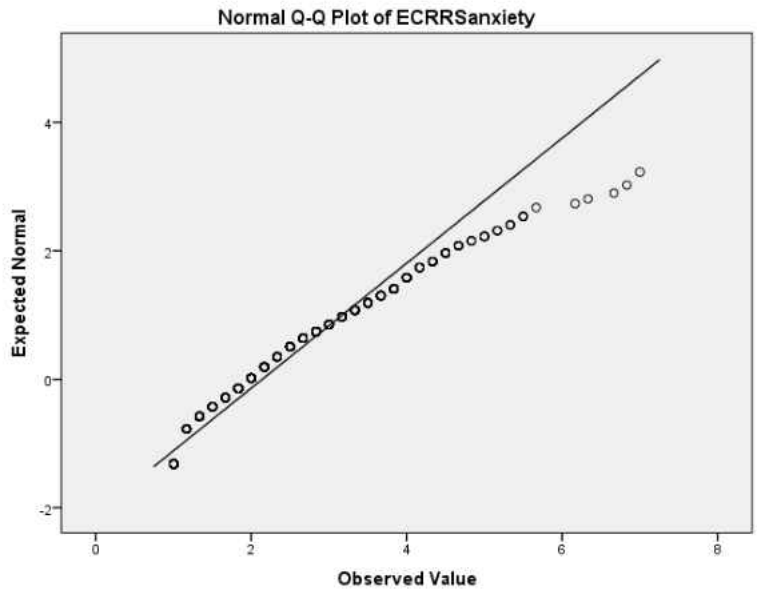


Figure 30: Normal Q-Q plot of ECR-RS - Anxiety

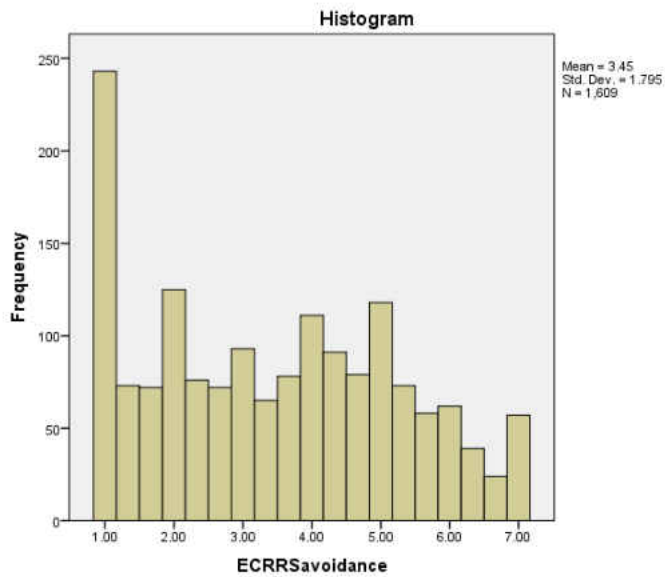


Figure 31: Histogram ECR-RS - Avoidance

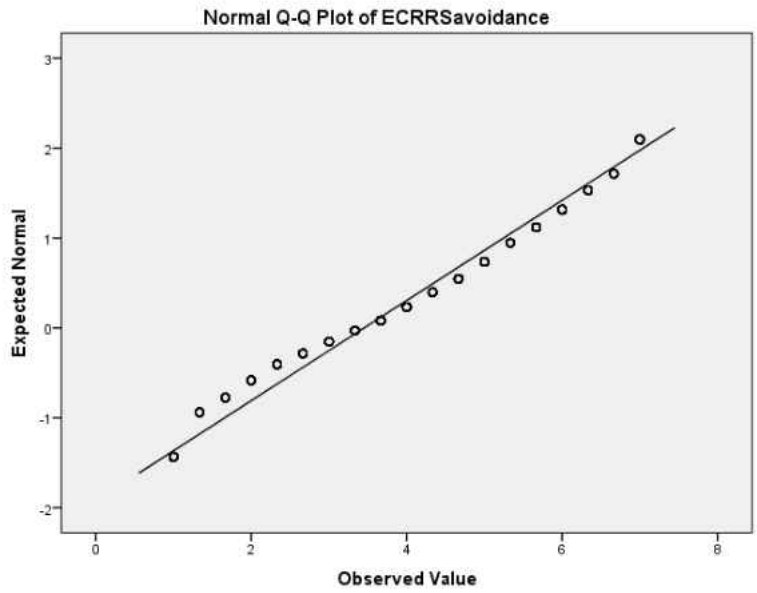


Figure 32: Normal Q-Q plot of ECR-RS - Avoidance

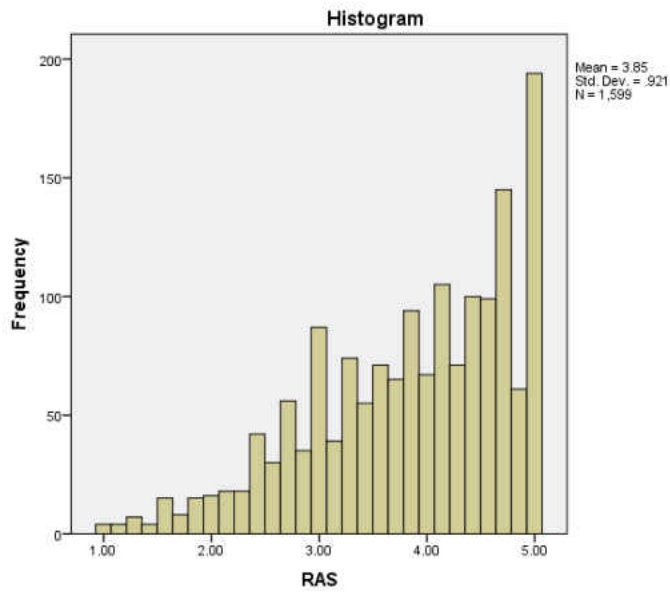


Figure 33: Histogram RAS

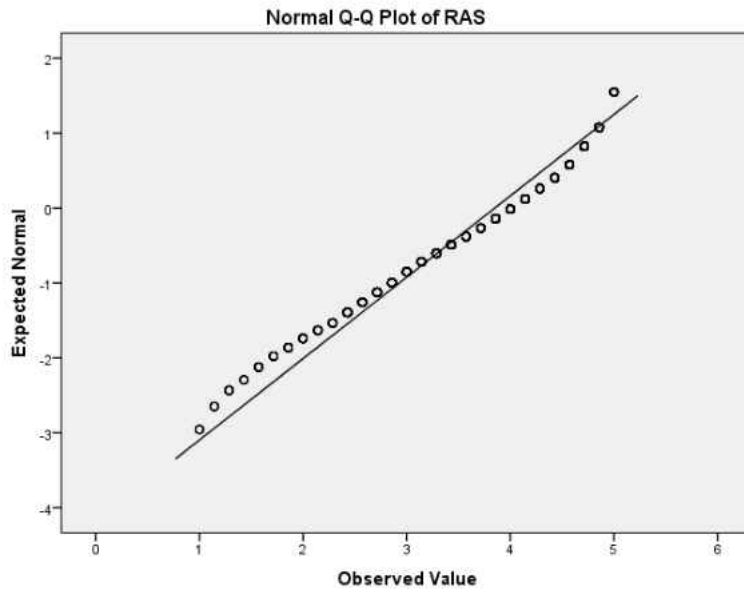


Figure 34: Normal Q-Q plot of RAS

Table 14

Tests of Normality

Subscale	Shapiro-Wilk		
	Statistic	<i>df</i>	Sig.
ODI - Attitudes	.857	504	.000
ODI - Intensity	.859	497	.000
AMES – Affective Empathy	.983	1605	.000
AMES – Cognitive Empathy	.973	1611	.000
AMES - Sympathy	.915	1607	.000
SOOS 1 ^a	.989	1603	.000
SOOS 2 ^b	.990	1602	.000
SOOS 3 ^c	.982	1605	.000
ECR-RS Anxiety	.908	1604	.000
ECR-RS Avoidance	.941	1609	.000
RAS	.934	1599	.000

Note. ^a Internalized Sexual Objectification scale. ^b Disempathy and Commenting About Individuals' Bodies scale. ^c Insulting Unattractive People scale.

When data are *not* normally distributed, researchers recommend performing transformations to reduce the influence of non-normality (Hair et al., 2006; Osborne,

2013; Tabachnick & Fidell, 2013). Tabachnick and Fidell (2013) suggested performing square root, logarithm, and inverse transformations depending on the severity of the non-normality, as each method is used for increasingly non-normal data. Depending on the positive or negative tail of the skew, the researchers suggested considering reflecting the data (e.g., balancing positive or negative skew) as part of the transformation (Tabachnick & Fidell, 2013). Therefore, the researcher performed all three transformations per variable (with or without reflection) and opted to use the transformation that produced “[...] the skewness and kurtosis values nearest zero, the prettiest picture, and/or the fewest outliers” (Tabachnick & Fidell, 2013, p. 86). The transformations that produced the least non-normal distribution are presented in Table 15.

Table 15

Transformations, Skewness and Kurtosis

Scale	Transformation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
ODI - <i>Attitudes</i>	none	.989	.109	.293	.217
ODI - <i>Intensity</i>	Logarithm	.615	.110	-.160	.219
AMES - <i>Affective</i>	none	.043	.061	.260	.122
AMES - <i>Cognitive</i>	none	-.189	.061	.355	.122
AMES - <i>Sympathy</i>	Reflect and Logarithm	.185	.061	-.798	.122
SOOS 1	none	-.117	.061	-.500	.122
SOOS 2	none	.049	.061	-.342	.122
SOOS 3	none	-.254	.061	-.253	.122
ECR-RS - <i>Anxiety</i>	Square root	.511	.061	-.402	.122
ECR-RS - <i>Avoidance</i>	none	.200	.061	-1.094	.122
RAS	none	-.683	.061	-.260	.122

Despite the implementation of various transformations, visual indicators of distribution patterns (e.g., histograms, Q-Q Plots) and values of skewness and kurtosis still revealed non-normal data (see Table 15). The researcher conducted a Shapiro-Wilk test and continued to find significance, which confirmed non-normality (see Table 16). Though normal distribution is an assumption for SEM, Tabachnick and Fidell (2013) noted “in a large sample, a variable with statistically significant skewness often does not deviate enough from normality to make a substantive difference in the analysis” (p. 80) and “in a large sample [i.e., $N > 200$], the impact of departure from zero kurtosis also diminishes” (p. 80).

Because multivariate normality requires the presence of univariate normality (Hair et al., 2006), the researcher assumed the data do *not* have multivariate normality.

Therefore, the researcher noted the impact of non-normal data distribution on the interpretation of the results. All analysis in future sections utilized the three transformed scales (*Intensity*, *Sympathy*, and *Anxiety*).

Table 16

Tests of Normality

Subscale	Shapiro-Wilk		
	Statistic	df	Sig.
ODI - <i>Attitudes</i>	.857	504	.000
ODI - <i>Intensity</i> ¹	.937	497	.000
AMES - <i>Affective Empathy</i>	.983	1605	.000
AMES - <i>Cognitive Empathy</i>	.973	1611	.000
AMES - <i>Sympathy</i> ²	.943	1607	.000
SOOS 1 ^a	.989	1603	.000
SOOS 2 ^b	.990	1602	.000
SOOS 3 ^c	.982	1605	.000
ECR-RS <i>Anxiety</i> ³	.940	1604	.000
ECR-RS <i>Avoidance</i>	.941	1609	.000
RAS	.934	1599	.000

Note. ¹Logarithm transformation. ²Reflect and Logarithm transformation. ³Square root transformation.

Multicollinearity. Multicollinearity is a high level of correlation ($r = .9$ or greater) between independent variables (Hair et al., 2006; Tabachnick & Fidell, 2013). This investigation contained one independent variable (online dating). However, because dependent variables can also be measured and used as independent variables in SEM (Kline, 2011), and dependent variables may be used to predict other variables, the researcher assessed for correlations between all observed variables (see Table 17). Furthermore, the researcher evaluated the Tolerance and Variance Inflation Factor (VIF) per construct (see Table 18), in which tolerance values below .10 and VIF values above 10 indicate multicollinearity (Pallant, 2010). The tolerance and VIF values for these data

are presented in Table 18. The researcher failed to identify correlations between variables at .9 or greater, and the researcher identified that all tolerance values were greater than .10 and all VIF values were below 10; thus, the researcher determined that multicollinearity was *not* present in these data.

Table 17

Correlations Between Variables

	O1	O2	A1	A2	A3	S1	S2	S3	E1	E2	R
O1	1										
O2	.602**	1									
A1	.089*	.071	1								
A2	-.040	.020	.259**	1							
A3	.025	-.004	-.475**	-.378**	1						
S1	.083	.082	-.062*	.044	.067**	1					
S2	-.014	.012	-.070**	.061*	.174**	.545**	1				
S3	-.038	.041	-.056*	.056*	.106**	.389**	.567**	1			
E1	.086	.070	-.159**	-.200**	.287**	.091**	.106**	-.034	1		
E2	.053	-.004	.087**	-.042	-.005	.134**	.071**	.023	.370**	1	
R	-.006	.038	.056*	.097**	-.132**	-.122**	-.075**	-.014	-.517**	-.375**	1

Note. ** Correlation is significant at the .01 level (2-tailed). * Correlation is significant at the .05 level (2-tailed).

Table 18

Tolerances and VIF Scores

Variable	ODI - Attitudes		ODI - Intensity	
	Tolerance	VIF	Tolerance	VIF
AMES - <i>Affective</i>	.753	1.328	.753	1.328
AMES - <i>Cognitive</i>	.822	1.217	.822	1.217
AMES - <i>Sympathy</i>	.648	1.543	.648	1.543
SOOS - 1	.677	1.476	.677	1.476
SOOS - 2	.533	1.875	.533	1.875
SOOS - 3	.657	1.521	.657	1.521
ECR-RS - <i>Anxiety</i>	.626	1.596	.626	1.596
ECR-RS - <i>Avoidance</i>	.785	1.274	.785	1.274
RAS	.690	1.449	.690	1.449

Linearity between variables. Tabachnick and Fidell (2013) described linearity as “[...] a straight-line relationship between two variables” (p. 83). Linear relationships are necessary to conduct SEM as Pearson’s r ignores nonlinear relationships between variables (Tabachnick & Fidell, 2013). The researcher reviewed bivariate scatterplots to identify linear and non-linear relationships between variables and conducted ANOVA to confirm non-linear relationships. Specifically, the researcher tested the best fitting relationship per construct (e.g., linear, cubic, and quadratic). The researcher presents the strongest curve fit relationship dependent variable in Table 19.

Table 19

Linearity Between Variables

		Curve Fit	t	Sig.
ODI – Attitudes	AMES – Affective	Linear	2.586	.108
	AMES – Cognitive	Cubic	-1.722	.086
	AMES – Sympathy	Cubic	-1.502	.134
	SOOS 1	Linear	1.613	.107
	SOOS 2	Cubic	1.092	.276
	SOOS 3	Cubic	.902	.368
	ECR-RS Anxiety	Quadratic	-2.314	.021
	ECR-RS Avoidance	Cubic	2.661	.008
	RAS	Cubic	-2.711	.007
ODI - Intensity	AMES – Affective	Cubic	-1.698	.092
	AMES – Cognitive	Cubic	-2.258	.024
	AMES – Sympathy	Cubic	1.177	.240
	SOOS 1	Cubic	1.994	.047
	SOOS 2	Quadratic	1.437	.151
	SOOS 3	Quadratic	2.061	.040
	ECR-RS – Anxiety	Quadratic	-2.343	.020
	ECR-RS – Avoidance	Quadratic	-.680	.497
	RAS	Linear	.818	.414

Tabachnick and Fidell (2013) suggested that most relationships between variables are not strictly linear, and that the strength of a linear relationship may compensate for the curve that exists. Tabachnick and Fidell (2013) recommended that researchers consider altering continuous variables to dichotomous variables for relationships in which the severity of the curve inhibits the detection of a relationship with Pearson's r . However, the authors also cautioned that changing variables to a dichotomous (i.e., high/low or yes/no) could potentially fail to account for relationships that exist. Therefore, because some degree of curve exists in most relationships and the data are free of *severe* curve-linear relationships (e.g., "U" shaped patterns), the researcher opted to *not* dichotomize variables. Thus, the researcher addressed the potential influence of curve-linear relationships in the limitations section (see chapter 5).

Homoscedasticity. Homoscedasticity refers to the homogeneity of variance on measure (Hair et al., 2006). Because of the non-normality of these data, the researcher assumed the data were heteroscedastic. The researcher reviewed scatterplots and confirmed unequal variance in participants' responses across measures. However, analyses of heteroscedastic data "[...] is weakened, but not invalidated" (Tabachnick & Fidell, 2013, p. 85). Therefore, the researcher did *not* manipulate the data to account for heteroscedasticity, and the researcher noted the potential impact of heteroscedasticity on the results in the discussion section (see chapter 5).

Adjusted Data Analyses

Upon completion of the data cleaning process, *no* additional cases were removed. Therefore, the researcher maintained the final sample size of 1,613 and the demographic data of the sample remained the same. However, the researcher performed three transformations on the data including a Logarithmic transformation on the ODI *Intensity* subscale, a reflect and Logarithmic transformation on the AMES *Sympathy* subscale, and a Square root transformation on the ECR-RS *Anxiety* subscale. The researcher presents the central tendencies of the original and transformed subscales in Table 20.

Table 20

Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
ODI - <i>Intensity</i>	1.61	.60	3.57	1.43	1
ODI - <i>Intensity</i> ^a	.18	.14	.66	.15	0
AMES – <i>Sympathy</i>	4.3	0.6	4	4.5	5
AMES - <i>Sympathy</i> ^b	.21	.15	.7	.18	0
ECR-RS – <i>Anxiety</i>	2.14	1.03	6	2	1
ECR-RS - <i>Anxiety</i> ^c	1.42	.34	1.65	1.41	1

Note. ^aLogarithmic transformation. ^bReflect and Logarithmic transformation. ^cSquare root transformation.

Estimation Techniques

When analyzing non-normal data, it is essential to address the violation of estimation assumptions through analytic strategies (Olsson, Foss, Troye, & Howell, 2000). For non-normally distributed samples, Kline (2011) recommended using generalized least squares (GLS) – a method of estimation similar to other weighted least squares (WLS) strategies. Kline (2011) described GLS as a preferred method for

estimating data with skew and kurtosis but cautioned that it requires a large sample size for complex models (e.g., $N > 500$). Because of the size of the sample in this investigation (e.g., $N > 500$), the researcher employed GLS to conduct CFA.

However, to conduct SEM, Maximum Likelihood is the preferred method of estimation as it (a) is considered consistent and efficient and (b) produces estimates that are asymptotically unbiased (Byrne, 2012). While ML requires multivariate normality, it is the preferred estimation technique when working with missing data (Byrne, 2010). Therefore, the researcher deemed ML to be best practice with these data (Osborne, 2013) and addressed the potential influence of non-normal data on the research results in the discussion section (see Chapter 5).

Fit Indices

The researcher utilized Pearson's correlation analysis to detect the strength, direction, and significance of relationships between constructs (Pallant, 2010). A correlation coefficient ranges from -1.00 to +1.00, in which the closer the value is to +/- 1, the stronger the relationship. The positivity or negativity of the value indicates the direction of the relationship. Cohen (1988) recommended researchers consider correlations between .10 and .29 as small, .30 and .49 as medium or moderate, and .5 to 1.00 as strong. The researcher also examined the overall goodness of fit using the fit indices described in Table 5.

Model Specification and Identification

Before conducting SEM, it is essential that a researcher builds a specified model based on a thorough review of the literature (Schumacker & Lomax, 2010). Thus, prior to data collection, the researcher conducted a critical review of the literature on social communication technology, online dating, empathy, objectification of others, and quality of emerging adults' romantic relationships (see chapter 2) and built a model specifying the anticipated relationships between constructs (see Figure 12). After model specification, the next step in SEM is model identification (Schumacker & Lomax, 2010).

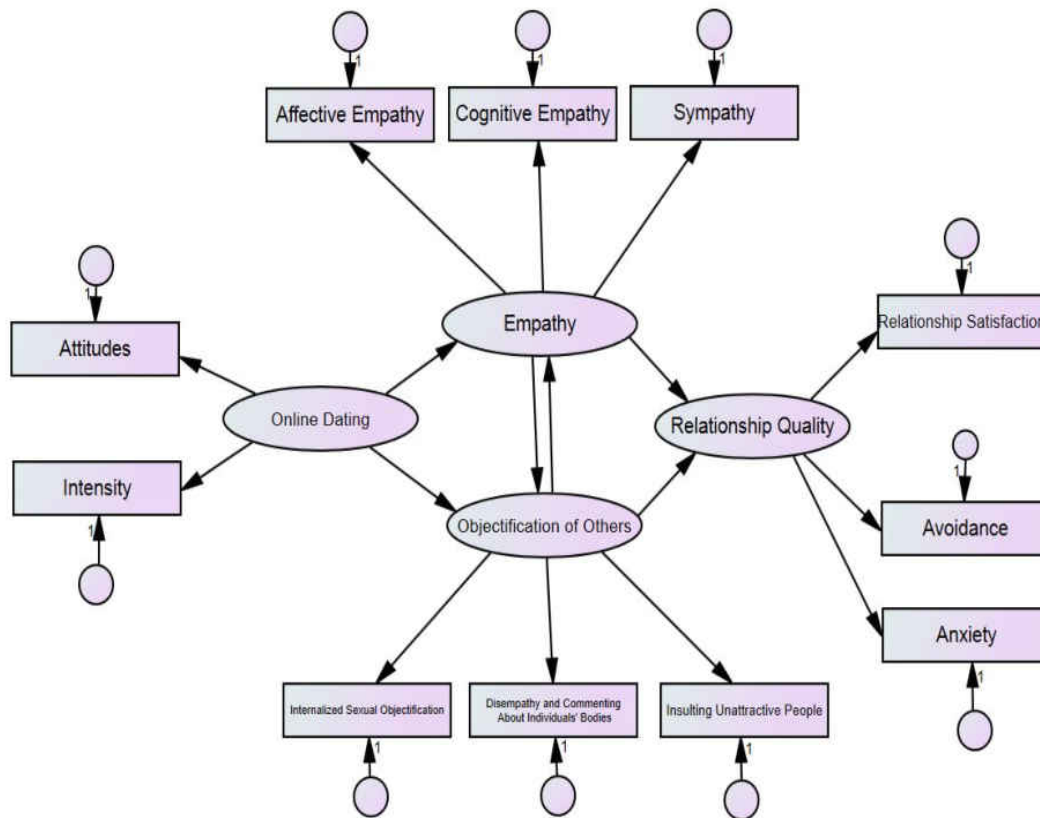


Figure 12: Path Diagram of the Structural Model to be Tested

In model identification, the researcher checked whether or not the model can produce a unique solution (Schumacker & Lomax, 2010). Crocket (2010) suggested two conditions in which the researcher may increase likelihood of identifying a model. First, Crocket (2010) suggested specifying a model in which there is (a) the existence of two or more latent variables, (b) at least three indicators per variable, (c) uncorrelated errors for each indicator, and (d) indicators loading on only one factor. Otherwise, Crocket (2010) recommended the researcher specify a model in which, (a) there are two or more latent variables, (b) one latent variable include only two indicators, (c) errors of indicators do not correlate, (d) indicators load on only one factor, and (e) variances or covariances between factors is zero. The researcher used Crocket's (2010) guidelines when conducting CFA to produce measurement models that not only provided strong model fit, but would also be effective for model identification. Ultimately, the researcher met criteria for Crocket's (2010) second set of guidelines (e.g., two or more latent variables, only one latent variable includes two indicators, errors of indicators do not correlate, indicators load on only one factor, and variances or covariances between factors is zero).

Therefore, the researcher conducted CFA for each measurement model prior to examining the hypothesized structured model (Byrne, 2010). For cases in which the measurement model was a poor fit, the researcher conducted EFA with a subsample and then confirmed the new model with CFA and a separate subsample of the complete data set (Kline, 2011). The researcher then reanalyzed the descriptive characteristics of the data with the modified instruments.

Confirmatory Factor Analysis for the Online Dating Inventory

The researcher modified Ellison and colleagues' (2007) *Facebook Intensity Scale* to measure emerging adults' use of online dating. The revised instrument (see Chapter 3) is referred to as the *Online Dating Inventory* (ODI). Initial Cronbach's α for the entire instrument was .815 and Cronbach's α for the *Attitudes* subscale was .801, while Cronbach's α for the *Intensity* subscale was .713; all of which acceptable levels of internal consistency (Hair et al., 2006). The researcher conducted a CFA on the anticipated factor structure of the ODI and identified low and high factor loadings ranging from .36 to .91 and a minimally acceptable model fit (see Figure 35; see Table 21). The initial model also included nine standardized residual covariance values greater than 2.58, seven of which existed between items 4 and 9. Therefore, the researcher modified the instrument by removing items 4 and 9, which resulted in factor loadings ranging from .36 to .90, one standardized covariance value exceeding 2.58, and stronger model fit ($\chi^2 [19, N = 494] = 53.494$, $CMIN/df = 2.839$, $GFI = .973$, $CFI = .885$, $RMSEA = .061$, $TLI = .831$). Therefore, the researcher modified the instrument further by removing item 10 due to its strong standardized covariance value and weak factor loading (e.g., .36). The final modifications resulted in the strongest version of the instrument with factor loadings ranging from .41 to .91, *no* standardized covariance values exceeding the threshold of 2.58 - only one value exceeding the recommended standardized covariance value of 1.96 - and acceptable model fit ($\chi^2 [13, N = 494] = 32.615$, $CMIN/df = 2.509$, $GFI = .981$, $CFI = .934$, $RMSEA = .055$, $TLI = .893$). The modified instrument is presented in Table 21 and Figure 36. The internal consistency reliability for the first

factor remained satisfactory with a Cronbach's α of .801, while Cronbach's α for the *Intensity* subscale increased to .726.

Table 21

Model Fit Indices of the ODI

	X^2	df	p	CMIN/ df	GFI	CFI	RMSEA	TLI
Theorized Measurement Model	169.424	34	.000	4.983	.931	.664	.090	.555
Modified Measurement Model 1	53.949	19	.000	2.839	.973	.885	.061	.831
Modified Measurement Model 2	32.615	13	.000	2.509	.981	.934	.055	.893

Note. $n = 494$.

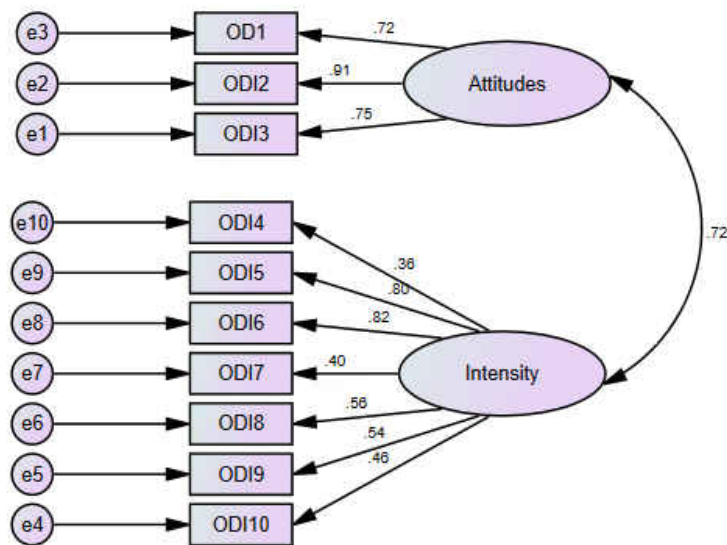


Figure 35: Confirmatory Factor Analysis: ODI

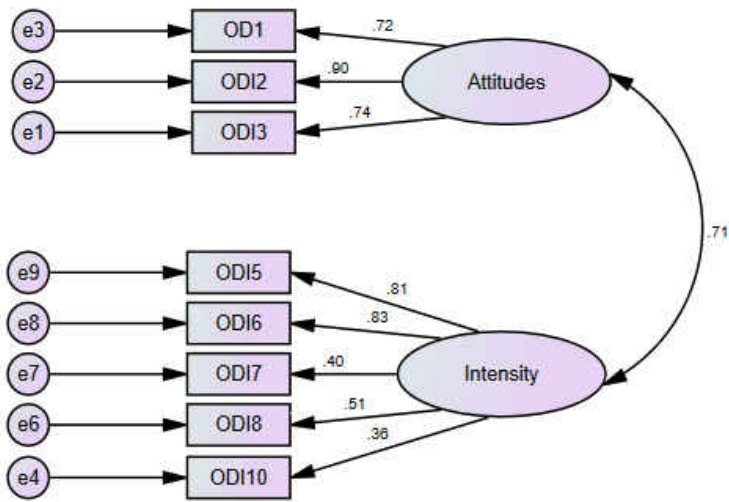


Figure 36: Confirmatory Factor Analysis: Modified ODI 1

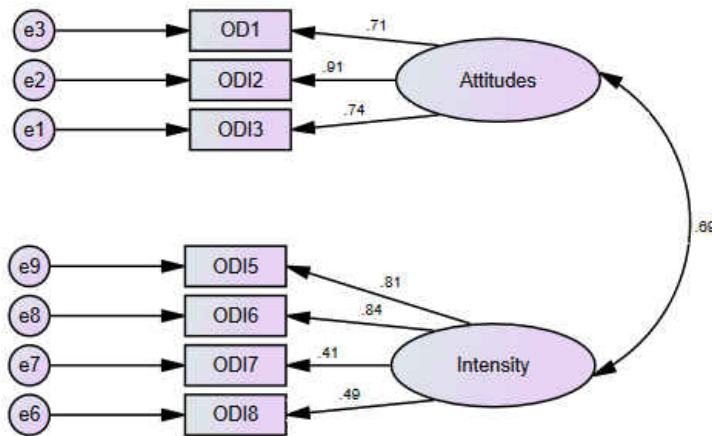


Figure 37: Confirmatory Factor Analysis: Modified ODI 2

Confirmatory Factory Analysis for the Adolescent Measure of Empathy and Sympathy

The researcher employed the *Adolescent Measure of Empathy and Sympathy* (AMES; Vossen et al., 2015) which measures participants' levels of empathy. The AMES has exemplified strong validity and reliability with adolescent populations, and is

suspected to be a viable instrument to use with emerging adults (Vossen et al., 2015). The initial internal consistency for the entire AMES ($\alpha = .822$) as well as the *Affective Empathy* subscale ($\alpha = .791$), *Cognitive Empathy* subscale ($\alpha = .787$), and the *Sympathy* subscale ($\alpha = .708$) were all acceptable with these data (Hair et al., 2006). The researcher conducted a CFA on the AMES and identified sufficient factor loadings ranging from .45 to .85 on the three factor model with only one item (item 6) registering as less than .5 (Comrey & Lee, 1992). The initial model (see Figure 38) identified an acceptable fit model fit (see Table 22). However, the initial model produced 12 covariance values greater than 2.58. Therefore, the researcher modified the AMES by removing item 6 due to its production of standardized error covariance, and allowed the error of items 8 and 10 to covary. The modified measurement model produced factors ranging from .47 to .88, with only one item (item 12) loading at less than .5. Therefore, the researcher removed item 12 and produced a stronger measurement model fit for these data (see Table 22). However, even this model fit still included 11 covariance scores greater than the threshold of 2.58. Therefore, the researcher opted to conduct EFA to find a better fitting model fit for these data.

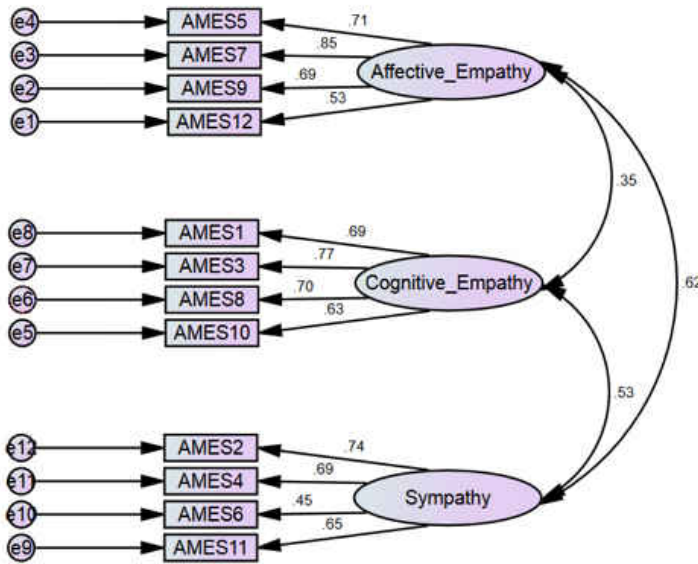


Figure 38: Confirmatory Factor Analysis: AMES

Table 22

Model Fit Indices of the AMES

	X^2	df	p	CMIN/ df	GFI	CFI	RMSEA	TLI
Theorized Measurement Model	476.310	51	.000	9.339	.951	.930	.072	.910
Modified Measurement Model	231.890	31	.000	7.480	.972	.962	.064	.944

Note. $n = 1598$.

Exploratory factor analysis with the AMES. Because of the presence of large covariances between items on the AMES, the researcher opted to conduct EFA to identify the best-fitting model for these data. First, the researcher randomly split the data in half to conduct EFA ($n = 812$). It is necessary to note that SPSS approximates splitting of data, thus subsample sizes are inconsistent and not an exact half of the total dataset ($N =$

1,613). Most researchers typically set an eigenvalue of 1.0 to identify retainable factors; however, this rule can lead to over-extraction (Henson & Roberts, 2006). Another tool available to researchers is the scree plot, in which researchers examine a break in the curve to identify the number of factors to retain (Costello & Osborne, 2005).

Unfortunately, the scree plot process is considered less than scientific (Patil, Singh, Mishra, & Donovan, 2007). Therefore, Henson and Roberts (2006) recommended using parallel analysis (Horn, 1965), in which eigenvalues extracted from the dataset are compared with randomly generated correlation matrices. With parallel analysis, factors are retained when eigenvalues are larger than randomly generated correlation matrices (Patil et al., 2007). Patil and colleagues (2007) created a website (<http://smishra.faculty.ku.edu/parallelengine.htm>) using SAS-based code written by O'Connor (2000) to identify eigenvalues from randomly generated correlation matrices. Thus, in the spirit of best practice, the researcher conducted all EFA with the identification of appropriate eigenvalues for these data using Principle Components Analysis (PCA) to maintain consistency with O'Connor's (2000) parallel analysis. The researcher compared the 95th percentile eigenvalues and with corresponding eigenvalues from this data set (Patil et al., 2007).

The researcher identified a statistically significant value for Bartlett's test of sphericity (Bartlett, 1954), and a Kaiser-Meyer-Olkin (KMO) value of .842, which is adequate for the instrument (Kaiser, 1970; 1974). With 12 variables and a sample size of 812, the researcher generated 100 random correlation matrices and compared them at the 95th percentile against the eigenvalues of these data. For factors to be retained, the first

factor would need to exceed an eigenvalue of 1.20, whereas the second factor would need to exceed 1.15, the third factor 1.11, fourth factor 1.07. A review of the scree plot provided support for the existence of a three-factor model (see Figure 39). Indeed, the initial EFA identified three factors with appropriate eigenvalues, which accounted for 59.54% of the variance, which is adequate (Hair et al., 2010). However, five items possessed communalities less than .5 and were thus were independently examined and ultimately removed (Comrey & Lee, 1992).

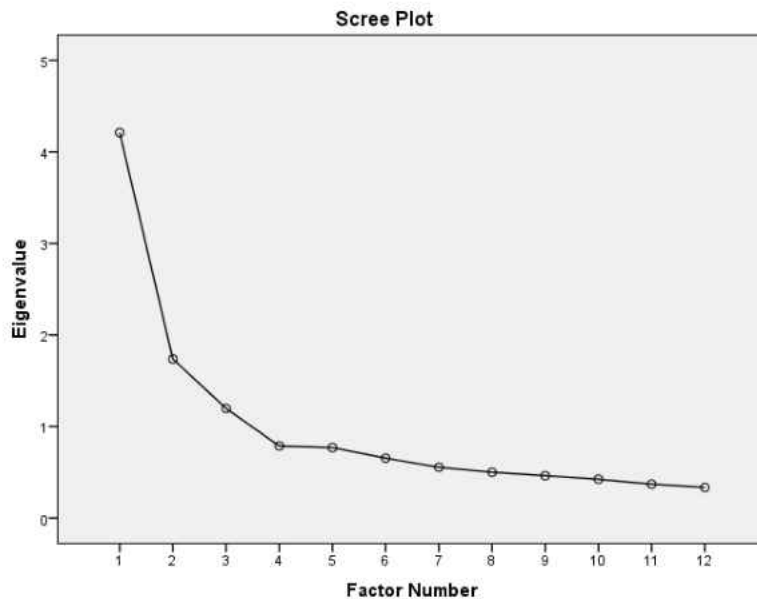


Figure 39: Scree Plot for the AMES, 12 Items

After independently examining and removing four items due to low communalities, to retain the one factor, the eigenvalue would need to exceed 1.15. To retain a second factor, eigenvalues would need to exceed 1.09, and a third factor would require an eigenvalue of 1.05 or greater. Thus, examination of the eigenvalues as well as a review of the scree plot provided evidence for a two factor structural model (see Figure

40). Items loaded on two factors that exceeded appropriate eigenvalues and accounted for 58.79% of the variance, which nears the cutoff point for acceptability (Hair et al., 2010; Henson & Roberts, 2006). The researcher reviewed the factor loadings and found that *all* items loaded on a factor above .32 (Tabachnick & Fidell, 2013). However, two items (items 2 and 4) cross-loaded on both factors and possessed communalities less than .5 and were thus independently examined and ultimately removed. An additional item (item 5) also had a communality value below .5 (.453), but did *not* strongly cross-load, and therefore was retained.

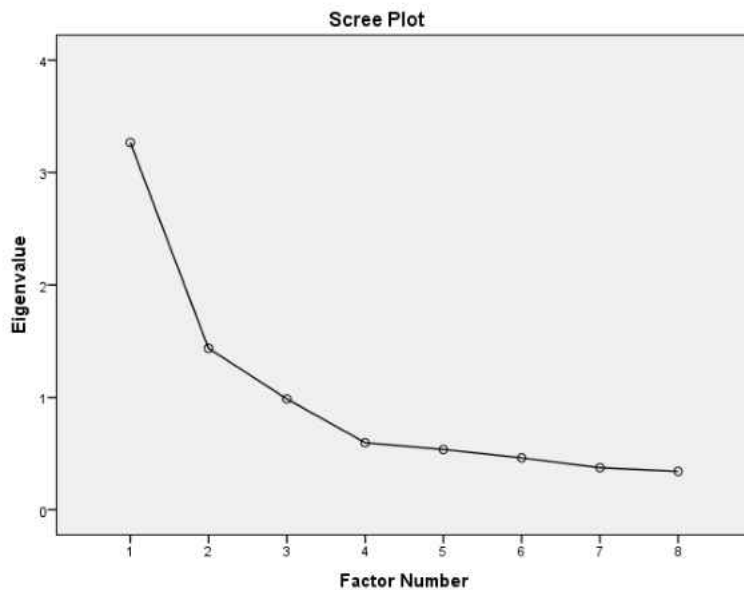


Figure 40: Scree Plot for the AMES, 8 Items

After removing items 2 and 4, the researcher identified a strong two-factor model fit with these data. With six items, an eigenvalue of 1.12 was required to retain one factor, while an eigenvalue of 1.06 was required to retain a second factor, and an eigenvalue of 1.02 was required to retain a third factor. Additionally, the scree plot (see

Figure 41) indicated the existence of two factors. Indeed, factors loaded across two factors with appropriate eigenvalues, and accounted for 68.89% of the variance, which exceeds the threshold for recommended variance accounted for in an assessment instrument (Hair et al., 2010). Items loaded at values greater than .5 (Comrey & Lee, 1992) and appeared theoretically sound (Hair et al., 2010; Tabachnick & Fidell, 2010). Factor loadings on the Structure Matrix are presented in Table 23.

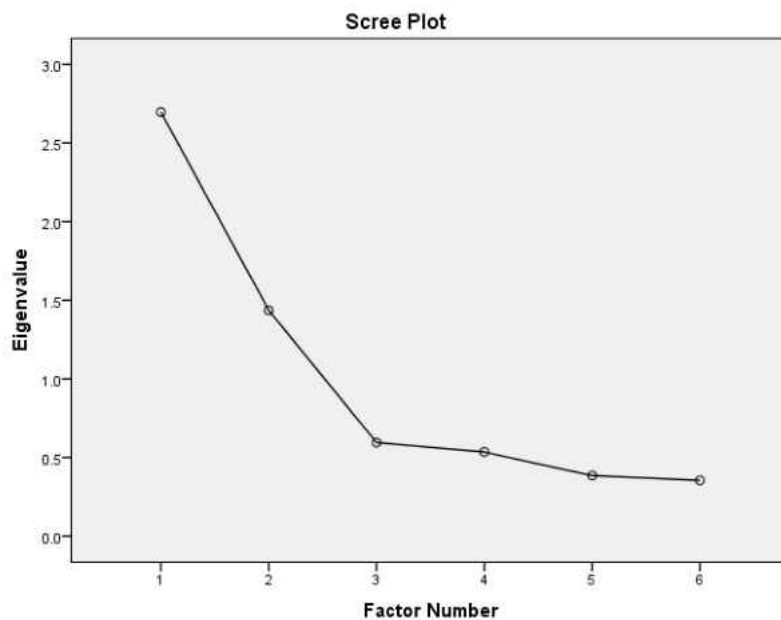


Figure 41: Scree Plot for the AMES, 6 Items

Table 23

Factor Loadings for the AMES with a Two-Factor Solution, 6 Items

Structure Matrix	Factor	
	1	2
Item 7	.880	.308
Item 5	.669	.259
Item 9	.649	.261
Item 3	.309	.815
Item 1	.200	.758

Item 8	.356	.615
--------	------	-------------

Note. Extraction method: Generalized Least Squares.

^aRotation method: Oblimin with Kaiser normalization.

With the AMES 6-item, two-factor solution, the first factor accounts for 44.96% of the variance and consists of 3 items. The first factor appears to revolve around themes related to affective empathy (e.g., “When my friend is sad, I become sad too”). Therefore, the researcher retained the label *Affective Empathy* for this revised factor. Similarly, the second factor accounts for 23.93% of the variance and consists of 3 items. The second factor appears to revolve around themes related to cognitive empathy (e.g., “I can often understand how people are feeling even before they tell me”). Therefore, the researcher retained the label *Cognitive Empathy* for this modified factor. Factors 1 and 2 are correlated ($r = .311, p < .01$), and both factors had acceptable internal consistency reliability ($\alpha = .812; \alpha = .768$).

Confirmatory factor analysis with the modified AMES. To provide evidence for the modified measurement model, the researcher conducted CFA with a random subsample of the data set ($n = 796$). The researcher identified adequate internal consistency reliability for the *Affective Empathy* ($\alpha = .790$) and *Cognitive Empathy* ($\alpha = .767$) factors. The measurement model contained sufficient loadings ranging between .61 and .90 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006), and was at the threshold for acceptable model fit (see table 24). However, four standardized residual covariances exceeded the 2.58. Nonetheless, the researcher deemed this model the strongest version of the modified instrument (see Figure 42).

Table 24

Model Fit Indices of the Modified AMES, 6 Items

	X^2	df	p	CMIN/ df	GFI	CFI	RMSEA	TLI
Theorized Measurement Model ^a	476.310	51	.000	9.339	.951	.930	.072	.910
Modified Measurement Model 1 ^a	231.890	31	.000	7.480	.972	.962	.064	.944
Modified Measurement Model 2 ^c	63.035	8	.000	7.879	.976	.963	.093	.931

Note. ^a $n = 1598$. ^b $n = 796$.

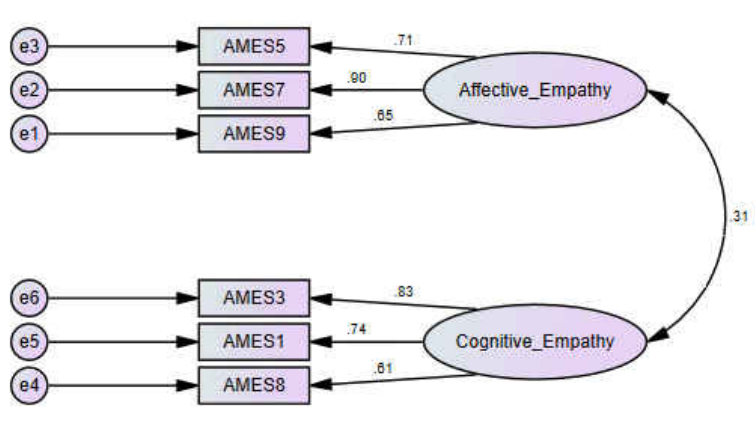


Figure 42: Confirmatory Factor Analysis Modified AMES Measurement Model

Confirmatory Factor Analysis of the Sexual-Other Objectification Scale (SOOS)

The researcher modified an instrument created by two students at Illinois Wesleyan University (see Curran, 2004; Zolot, 2003), now called the *Sexual-Other Objectification Scale* (see Chapter 3), to measure participants' levels of objectification of others. The SOOS has *not* been validated in any research studies and has three anticipated

factors (a) *Internalized Sexual Objectification* (items 1, 2, 5, 9, and 11), (b) *Disempathy and Commenting About Individuals' Bodies* (items 4, 6, 8, and 10), and (c) *Insulting Unattractive People* (items 3, 7, and 12). The initial internal consistency for the entire SOOS ($\alpha = .835$) and the *Internalized Sexual Objectification* scale (items 1, 2, 5, 9, and 11; $\alpha = .805$) were both acceptable (Hair et al., 2010). However, the internal consistency for the *Disempathy and Commenting About Individuals' Bodies* scale ($\alpha = .610$) and the *Insulting Unattractive People* scale ($\alpha = .607$) were questionable with these data (Hair et al., 2006). Items loaded with values ranging between .32 and .93, with several values under .5 (Comrey & Lee, 1992). The initial measurement model did *not* show strong model fit and contained several ($n = 54$) standardized residual covariance values above 2.58 (see Figure 43, see Table 25). Therefore, the researcher removed items 1, 11, and 12 due to weak factor loading and multiple standardized residual covariance values above 2.58. The modified model was stronger than the initial model (e.g., stronger factor loadings, stronger fit indices, fewer standardized residual covariance values greater than 2.58; see figure 44); however, it still contained poorer fit indices than acceptable and multiple ($n = 14$) standard residual covariance values exceeding 2.58. Furthermore, the modified measurement model only contained two items on the third factor, which is insufficient to justify the existence of the factor (Hair et al., 2010). Therefore, the researcher opted to conduct EFA to examine the best fitting factor structure of the assessment.

Table 25

Model Fit Indices of the SOOS

	X^2	df	p	CMIN/ df	GFI	CFI	RMSEA	TLI
Theorized Measurement Model	716.256	51	.000	14.044	.925	.553	.091	.421
Modified Measurement Model	291.367	24	.000	12.140	.959	.778	.084	.667

Note. $n = 1584$. Due to pairwise deletion, sample sizes varied per measurement.

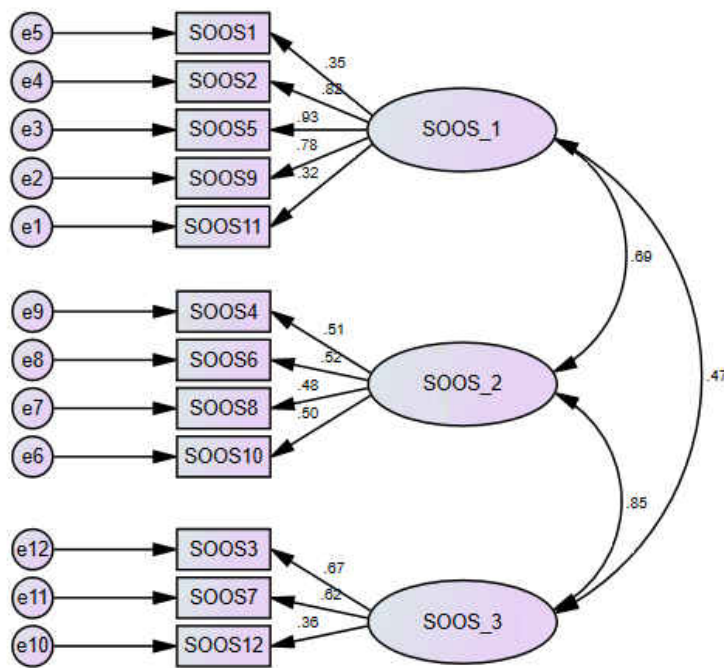


Figure 43: Confirmatory Factor Analysis: SOOS

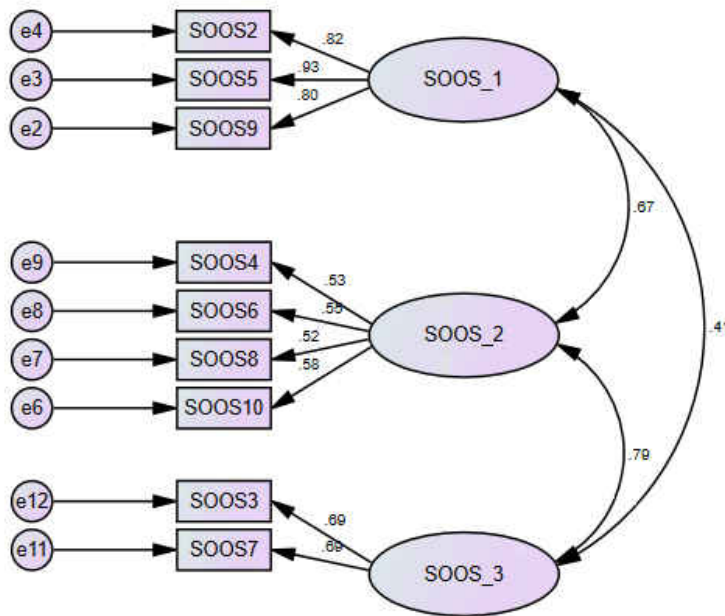


Figure 44: Confirmatory Factor Analysis: Modified SOOS

Exploratory factor analysis with the SOOS. The initial measurement model of the SOOS exemplified poor factor loadings, weak measurement of fit, and multiple standardized residual covariance values that exceeded 2.58. Thus, the researcher conducted an EFA to identify the best-fitting model for these data. First, the researcher randomly split the data in half to conduct EFA ($n = 820$). The researcher identified a statistically significant value for Bartlett's test of sphericity (Bartlett, 1954), and a sufficient Kaiser-Meyer-Olkin (KMO) value of .836 (Kaiser, 1970; 1974). With a sample size of 820 and 12 items, the researcher generated 100 random correlation matrices and compared them with the data's eigenvalues at the 95th percentile (Patil et al., 2007). To retain one factor, an eigenvalue of 1.20 was required. To retain a second factor, an eigenvalue of 1.15 was required. An eigenvalue of 1.11 was required to retain a third factor. To retain a fourth factor, an eigenvalue of 1.07 was necessary. The researcher

reviewed the scree plot to identify factor solutions (Hair et al., 2010) and identified support for a three-factor model (see Figure 45). The 12-item instrument contained three factors with appropriate eigenvalues that accounted for 58.73% of the variance, which is near adequate (Hair et al., 2010). Six items possessed communalities less than .5 (e.g., items 1, 4, 6, 7, 8, 10); however, two of those items (e.g., item 7, “I have made comments to friends about someone I find unattractive;” item 10 “I have rated people’s level of attractiveness”) are theoretically relevant and were initially retained, whereas items 1, 4, 6, and 8 were examined independently and removed (Comrey & Lee, 1992).

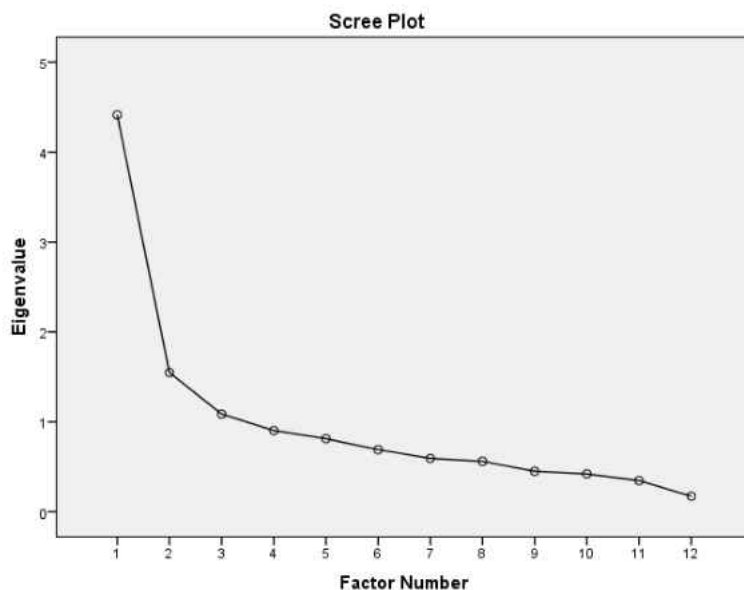


Figure 45: Scree Plot for the SOOS, 12 Items

After removing four items due to low communalities, the researcher identified evidence of a two-factor structural model (see Figure 46), as one eigenvalue exceeded 1.15 and a second eigenvalue exceeded 1.09. The two-factor structural model accounted for 61.63% of the variance. However, the 8-item instrument contained 5 items with communality values lower than .5 (see Table 26). Prior to removing any items due to low

commonality, the researcher also considered factor loadings and identified strong values per item per factor (e.g., $> .5$; Comrey & Lee, 1992). While several items possessed low communality, and several items loaded at values greater than $.32$ on both factors, only item 11 *also* appeared to *not* theoretically align with the content of either factor (Tabachnick & Fidell, 2013). Thus, item 11 was removed and the factor structure of the model was examined again. Without item 11, item 12 (e.g., “It is natural to comment on a person’s physical features”) contained minimal communalities ($.325$), appeared to deviate from the content of the other items on factor two and was the weakest loading item on the second factor ($.512$). Thus, the researcher removed item 12 and conducted an EFA on the 6-item scale.

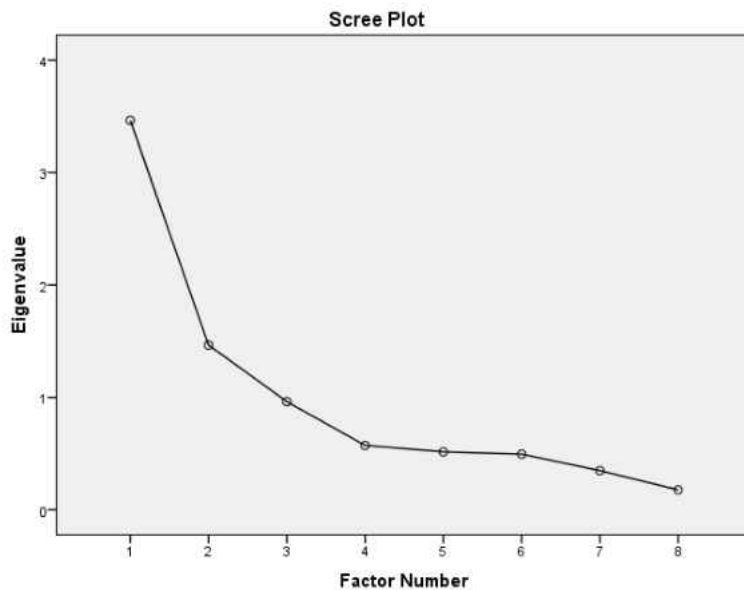


Figure 46: Scree Plot for the SOOS, 8 Items

Table 26

Communalities for SOOS, 8 Items

Item number	Item Content	Communalities (Extracted)
2	When I see an attractive person, I wonder what sex with them would be like	.720
3	I have made jokes about someone who is ugly or fat	.381
5	I often imagine what someone would be like in bed	.912
7	I have made comments to friends about someone I find unattractive	.485
9	I often imagine what someone looks like naked	.615
10	I have rated people's level of attractiveness	.431
11	I enjoy it when an attractive person wears attractive clothing	.461
12	It is natural to comment on a person's physical features	.463

Note. Extraction method: Generalized Least Squares

The six-item scale possessed a statistically significant value for Bartlett's test of sphericity (Bartlett, 1954), and a sufficient Kaiser-Meyer-Olkin (KMO) value of .752 (Kaiser, 1970; 1974). With six items, an eigenvalue of 1.11 was required to retain one factor. To retain a second factor, an eigenvalue of 1.06 was needed. To retain a third factor, the researcher would have needed to have identified an eigenvalue greater than 1.02. The researcher reviewed the scree plot of the modified instrument and identified support for a two-factor structure with a steep decline after the first factor and a plateau after the third factor, lending support for a two factor model solution for the SOOS with these data (see Figure 47).

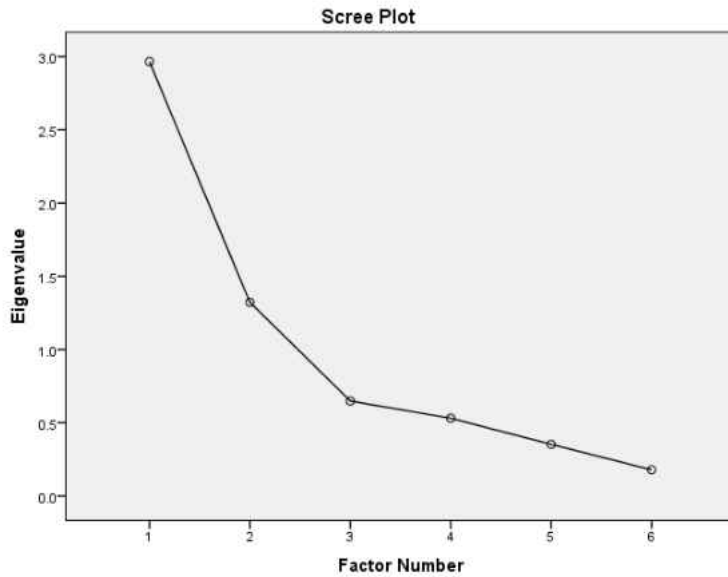


Figure 47: Scree Plot for the SOOS, 6 Items

The 6-item SOOS contained two factors with appropriate eigenvalues and accounted for 71.48% of the variance, which exceeds the recommended cutoff of 60% (Hair et al., 2010). Two items (item 3, .410; item 10, .327) did *not* meet the communality cut-off of .5 (Comrey & Lee, 1992), but exemplified strong factor loading and were theoretically relevant (Hair et al., 2010); therefore, the researcher selected to retain these items. The researcher presents factor loadings in Table 27.

Table 27

Factor Loadings for the SOOS with a Two-Factor Solution, 6 Items

Structure Matrix	Factor	
	1	2
Item 5	.950	.370
Item 2	.844	.290
Item 9	.773	.451
Item 7	.230	.730
Item 3	.262	.638
Item 10	.365	.544

Note. Extraction method: Generalized Least Squares.

^aRotation method: Oblimin with Kaiser normalization.

The first factor contained three items (2, 5, 9) and accounted for 49.43% of the variance. Factor one appears to revolve around themes related to sexualizing another person (e.g., “I often imagine what someone would be like in bed”). Therefore, the researcher named factor one *Sexual Objectification*. The second factor accounts for 22.04% of the variance and consists of 3 items (7, 3, 10). The second factor appears to revolve around themes related to unkind thoughts and feelings towards others (e.g., “I have made jokes about someone who is ugly or fat”). Therefore, the researcher labeled factor two: *Disempathy*. Factors 1 and 2 correlated ($r = .413, p < .01$). The first factor had acceptable internal consistency reliability ($\alpha = .887$) and the second factor had questionable internal consistency reliability ($\alpha = .664$).

Confirmatory factor analysis with the modified SOOS. To provide evidence for the modified measurement model, the researcher conducted CFA with a random subsample of the data set ($n = 764$). After modifying the model, the researcher identified adequate internal consistency reliability for the *Sexual Objectification* ($\alpha = .882$) and *Disempathy* ($\alpha = .676$) factors. The measurement model contained sufficient loadings

ranging between .60 and .94 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006), and bordered acceptable model fit (see Table 28). Additionally, three standardized residual covariances associated with item 10 exceeded the 2.58 criteria. Thus, the researcher removed item 10 and identified the strongest version of the modified instrument (see Table 28).

Table 28

Model Fit Indices of the Modified SOOS, 6 Items

	X^2	<i>df</i>	<i>p</i>	CMIN/ <i>df</i>	GFI	CFI	RMSEA	TLI
Theorized Measurement Model ^a	716.256	51	.000	14.044	.925	.553	.091	.421
Modified Measurement Model 1 ^a	291.367	24	.000	12.140	.959	.778	.084	.667
Modified Measurement Model 2 ^b	56.248	8	.000	7.031	.975	.899	.089	.810
Modified Measurement Model 3 ^b	21.371	4	.000	5.343	.989	.962	.075	.905

Note. ^a*n* = 1584. ^b*n* = 764.

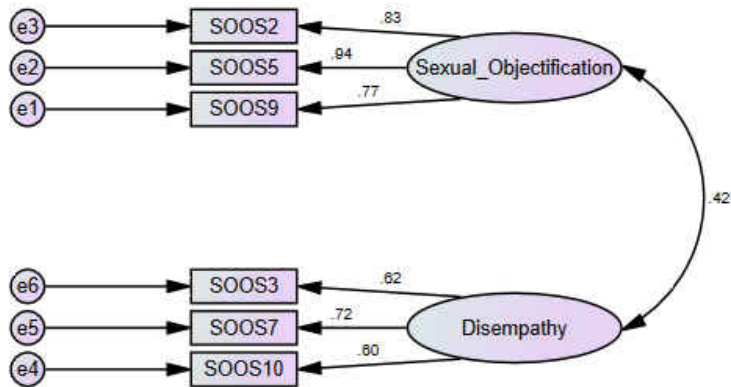


Figure 48: Confirmatory Factor Analysis: Modified SOOS Measurement Model 2, 6

Items

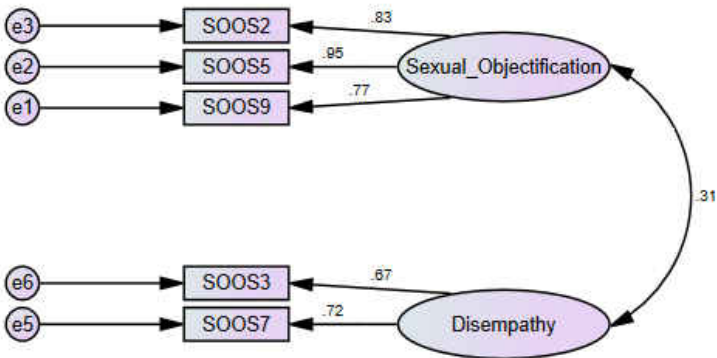


Figure 49: Confirmatory Factor Analysis: Modified SOOS Measurement Model 3, 5

Items

The final modified measurement model for the SOOS result in a two-factor solution that accounted for 78.65% of the variance. Despite the existence of only two items on the second factor, this model met Crocket's (2010) guidelines for model identification and the researcher deemed this the strongest version of the instrument with

these data based on a balance between theory, fit matrices, strong factor loadings, and *no* standardized residual covariance values exceeding the 2.58 threshold.

Confirmatory Factor Analysis for the Relationship Structure Questionnaire (ECR-RS)

The researcher utilized The *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) to measure an individual's attachment style. The ECR-RS is a 9-item questionnaire with two factors (i.e., *Anxiety*, *Avoidance*). The researcher conducted a CFA on the ECR-RS and identified acceptable initial internal consistency reliability for the whole instrument ($\alpha = .845$), and acceptable initial internal consistency reliability for the *Anxiety* ($\alpha = .858$) and *Avoidance* subscales ($\alpha = .901$). The measurement model contained mostly sufficient loadings ranging between .49 and .91 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006), but exemplified weak model fit (see Table 29) with many ($n = 28$) standardized residual covariances exceeding the 2.58 threshold. Therefore, the researcher modified the measurement model by independently examining and removing items 5 and 6. In addition to the removal of items 5 and 6, the researcher allowed for covariance between items 1 and 3, and items 2 and 4. The resulting model exemplified an acceptable model fit (see Table 29), but still contained several ($n = 10$) covariance scores greater than 2.58.

Table 29

Model Fit Indices of the ECR-RS

	X^2	<i>df</i>	<i>p</i>	CMIN/ <i>df</i>	GFI	CFI	RMSEA	TLI
Theorized Measurement Model	523.407	26	.000	20.131	.976	.691	.109	.572
Modified Measurement Model	120.051	11	.000	10.914	.979	.919	.079	.854

Note. $n = 1601$. Due to pairwise deletion, sample sizes varied per measurement.

Exploratory factor analysis with the ECR-RS. Due to the existence of several large standardized residual covariances in the matrix, the researcher conducted an exploratory factor analysis (EFA; Kline, 2011) on the ECR-RS. The researcher identified a statistically significant value for Bartlett's test of sphericity (Bartlett, 1954), and a value greater than .5 (.847) for Kaiser-Meyer-Olkin (KMO) sampling adequacy for the instrument (Kaiser, 1970; 1974). To retain one factor, an eigenvalue of 1.11 was required. To retain a second factor, an eigenvalue of 1.08 was needed. To retain a third factor, an eigenvalue of 1.05 was required. The initial EFA identified two factors with appropriate eigenvalues that accounted for 71.4% of the variance, which is acceptable (Hair et al., 2006). The researcher reviewed the scree plot and confirmed the likelihood of a two-factor solution (Patil et al., 2007; see Figure 50), which mirrored the anticipated structure delineated by Fraley and colleagues (2011). Factor loadings for the 9-item ECR-RS are presented in Table 30. The researcher failed to identify any items with low commonality (< .5) or low factor loadings (< .3) to warrant their removal (Hair et al., 2006). However, items 5 and 6 both cross-loaded at values greater than .32 and were independently

examined and then removed (Tabachnick & Fidell, 2013). The scree plot for the 7-item instrument is presented in Figure 51. Factor loadings for the 7-item ECR-RS are presented in Table 31.

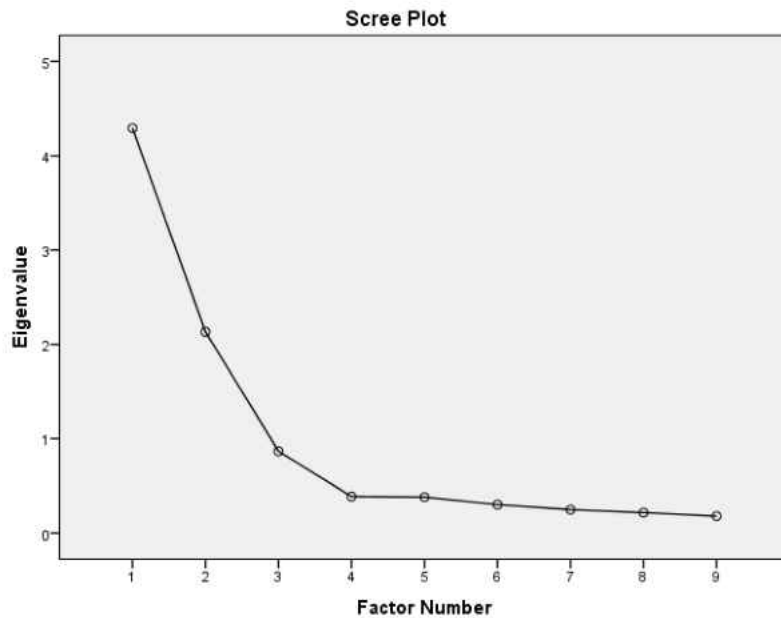


Figure 50: ECR-RS Scree Plot, 9 Items

Table 30

Factor Loadings for the ECR-RS with a Two-Factor Solution, 9 Items

Structure Matrix	Factor	
	1	2
Item 2	.906	.204
Item 3	.875	.194
Item 1	.812	.175
Item 4	.761	.278
Item 6	.568	.463
Item 5	.512	.371
Item 8	.231	.887
Item 7	.370	.866
Item 9	.212	.857

Note. Extraction method: Generalized Least Squares.

^aRotation method: Oblimin with Kaiser normalization.

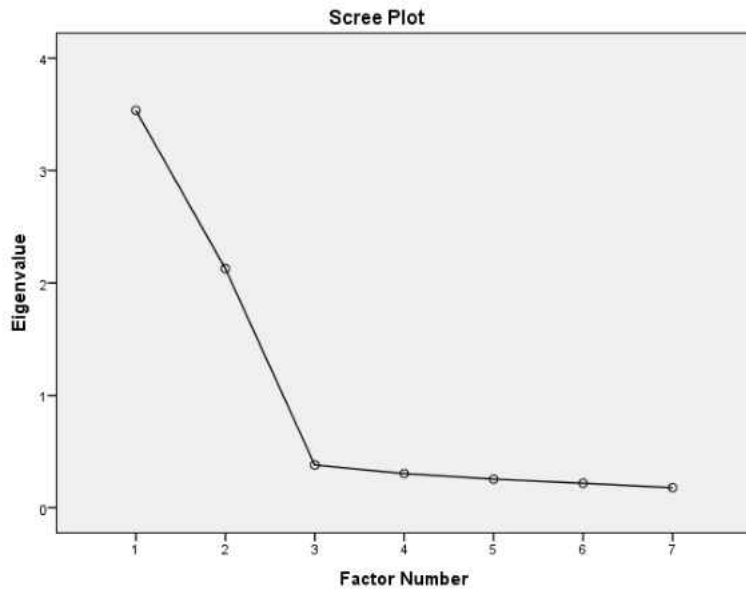


Figure 51: ECR-RS Scree Plot, 7 Items

Table 31

Factor Loadings for the ECR-RS with a Two-Factor Solution, 7 Items

Structure Matrix	Factor	
	1	2
Item 2	.913	.204
Item 3	.886	.194
Item 1	.816	.175
Item 4	.757	.278
Item 8	.177	.894
Item 9	.162	.864
Item 7	.311	.855

Note. Extraction method: Generalized Least Squares.

^aRotation method: Oblimin with Kaiser normalization.

With the removal of two items, the researcher identified a two-factor solution with appropriate eigenvalues (e.g., > 1.09, > 1.05) that accounted for 80.91% of the variance (see Figure 51). In this second model, *no* item cross-loaded at a value greater than .311 (see Table 31), which is *not* considered a sufficient factor loading (Tabachnick

& Fidell, 2013). Because this more parsimonious model accounted for over 80% of the variance, containing sufficient (e.g., $> .5$) commonalities and *no* cross-loadings (Costello & Osborne, 2005), the researcher determined that this model was the best-fitting model for these data. The final internal consistency reliability for the *Avoidance* ($r = .903$) and *Anxiety* ($r = .902$) was strong. This model was identical to the modified measurement model tested through CFA, which exemplified acceptable model fit with poor standardized residual covariances (see Table 29). Therefore, despite the poor residual covariances, the modified measurement model of the ECR-RS with items 5 and 6 removed and covariance between the error of items 1 and 3, and items 2 and 4, was deemed the best-fitting and most parsimonious model for these data (see Figure 52).

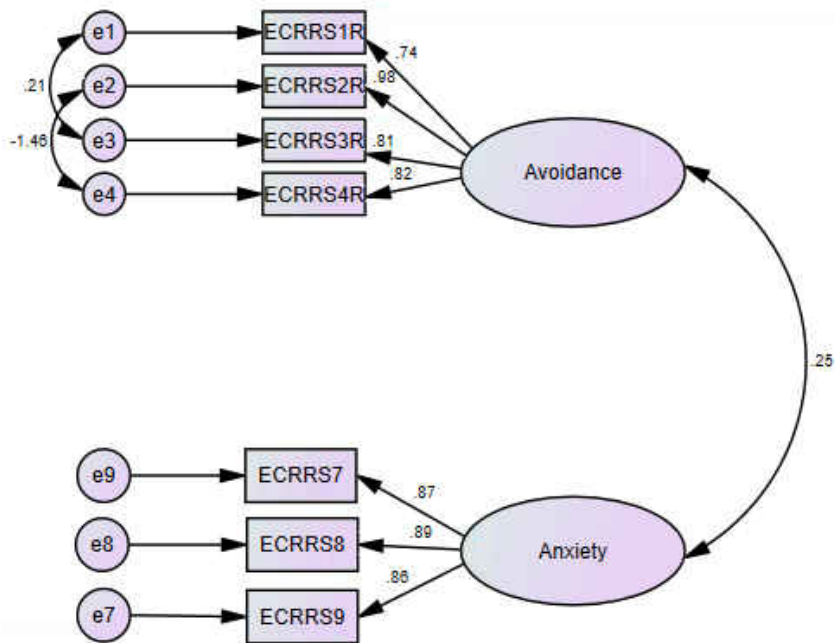


Figure 52: Confirmatory Factor Analysis: ECR-RS

Confirmatory Factory Analysis for Relationship Assessment Scale

The researcher measured relationship with the *Relationship Assessment Scale* (RAS; Hendrick, 1988). The theoretical structure of the RAS was tested and supported by Hendrick (1988), which indicated a one-factor solution that explained 46% of the variance. The researcher conducted a CFA on the RAS measurement model with these data and identified sufficient factor loadings ranging from .61 to .91 on the one-factor model with strong initial internal consistency reliability ($\alpha = .89$). However, the cutoff criteria for the specified fit indices were *not* met (see Table 32). Therefore, the researcher modified the RAS measurement model by allowing items 6 and 7 (-.25) and items 4 and 7 (.23) to covary (see Figure 53). With the modified measurement model, the researcher identified sufficient factor loadings ranging from .56 to .91 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006). The modified measurement model produced only one covariance score greater than 1.96; however, it was still acceptable (e.g., < 2.58) and supported the strength of the model (Schumacher & Lomax, 2010). The modifications to the measurement model resulted in a strong model fit for the RAS (see Table 32).

Table 32

Model Fit Indices of the RAS

	X^2	<i>df</i>	<i>p</i>	CMIN/ <i>df</i>	GFI	CFI	RMSEA	TLI
Theorized Measurement Model	245.371	14	.000	17.526	.956	.747	.102	.620
Modified Measurement Model	57.724	12	.000	4.810	.990	.950	.049	.912

Note. $n = 1599$. Due to pairwise deletion, sample sizes varied per measurement.

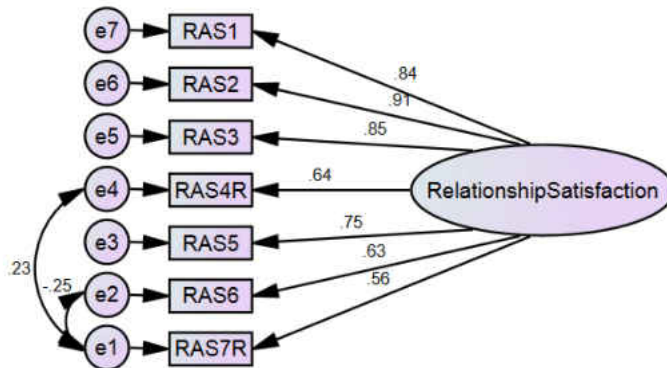


Figure 53: Confirmatory Factor Analysis: RAS

Confirmatory Factor Analysis for Relationship Quality

To measure the latent construct of relationship quality, the researcher utilized the modified *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) and *Relationship Assessment Scale* (RAS; Hendrick, 1988). The researcher conducted CFA on the measurement model and identified a strong model fit (see figure 54; see table 33). The researcher identified sufficient factor loadings ranging from .55 to .95 on the three-factor model (Comrey & Lee, 1992; Tabachnick & Fidell, 2006). The overall model had questionable initial internal consistency ($\alpha = .461$); however, lower levels of internal consistency are appropriate if a measurement model contains heterogeneous items and/or factors (Cronbach, 1951).

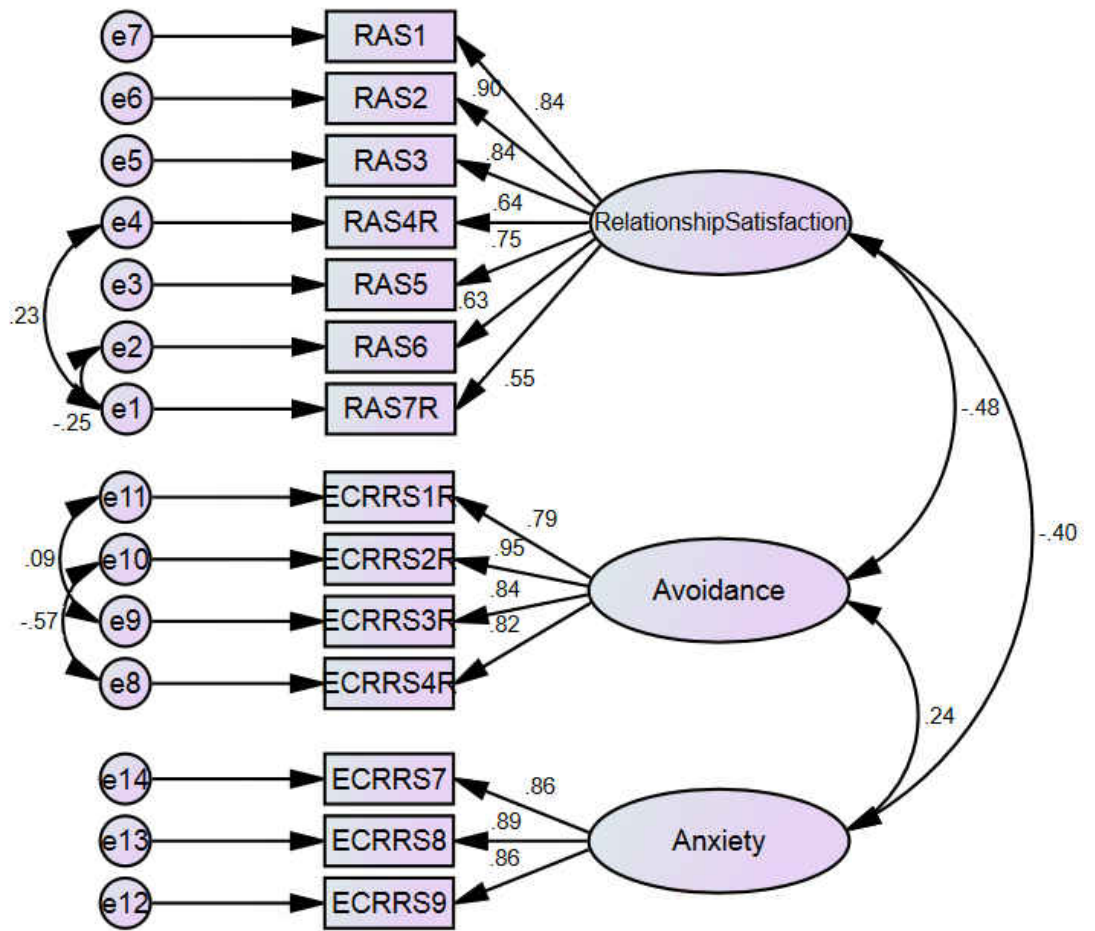


Figure 54: Confirmatory Factor Analysis: Relationship Quality

Table 33

Model Fit Indices for Relationship Quality

	X^2	df	p	CMIN/ df	CFI	RMSEA	TLI
Theorized Measurement Model	412.073	70	.000	5.887	.976	.055	.965

Note. $n = 1613$. Due to pairwise deletion, sample sizes varied per measurement.

Secondary Analyses of Descriptive Statistics and Statistical Assumptions

The researcher examined the measurement models to be used in this investigation with these data. The researcher modified all instruments used in this investigation to find the strongest balance between theory, fit indices, factor loadings, communalities, and standardized residual covariance values. The researcher presents the modified instruments in Figures 55-59 and the revised structural model in Figure 60.

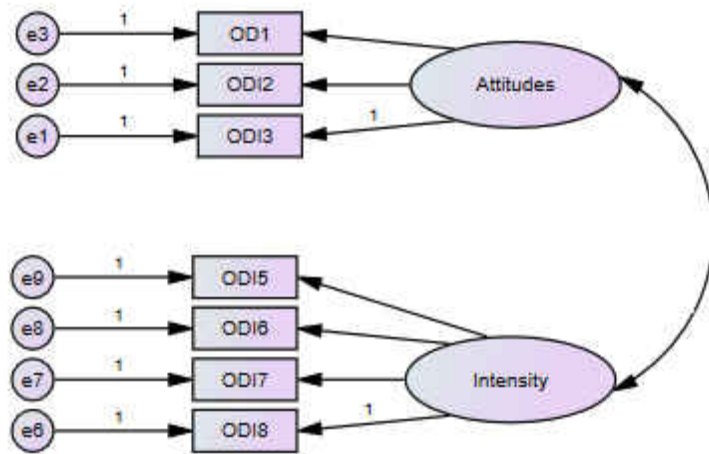


Figure 55: Modified Measurement Model - ODI

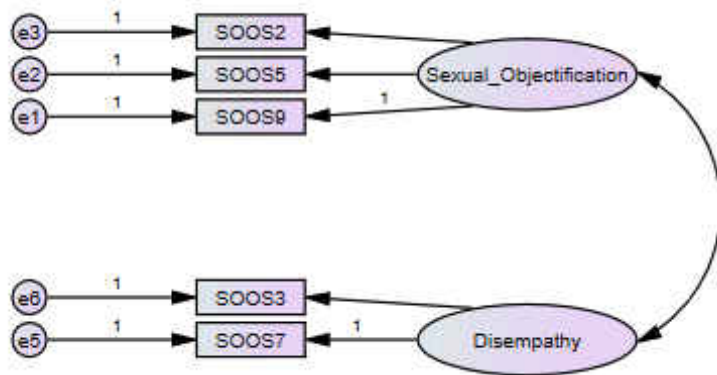


Figure 56: Modified Measurement Model - SOOS

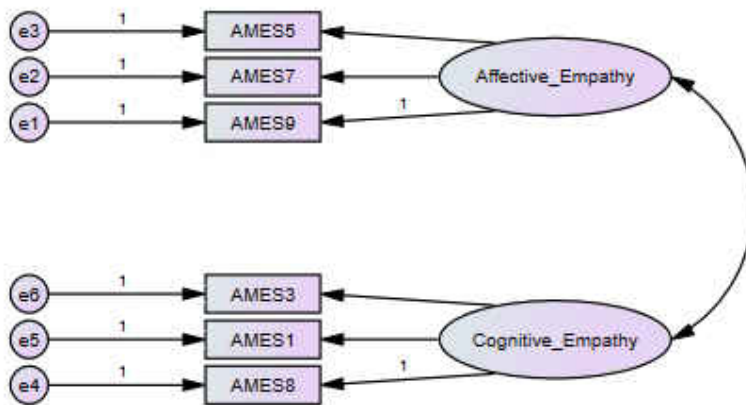


Figure 57: Modified Measurement Model - AMES

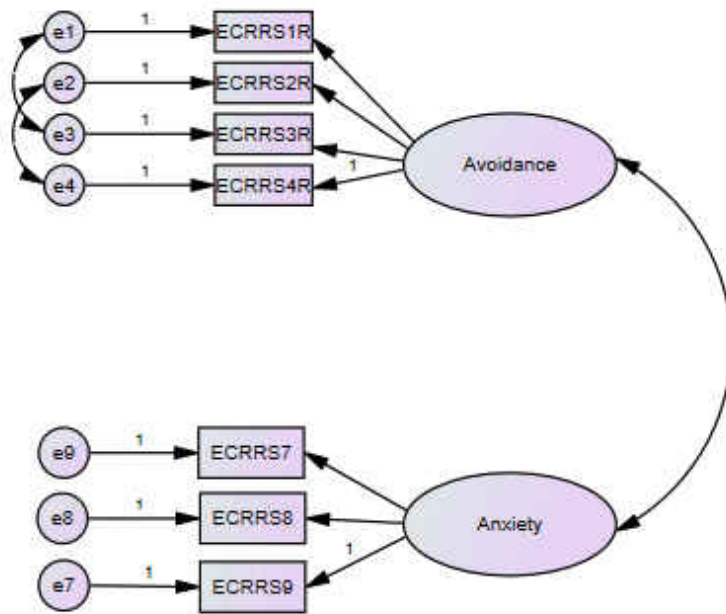


Figure 58: Modified Measurement Model - ECR-RS

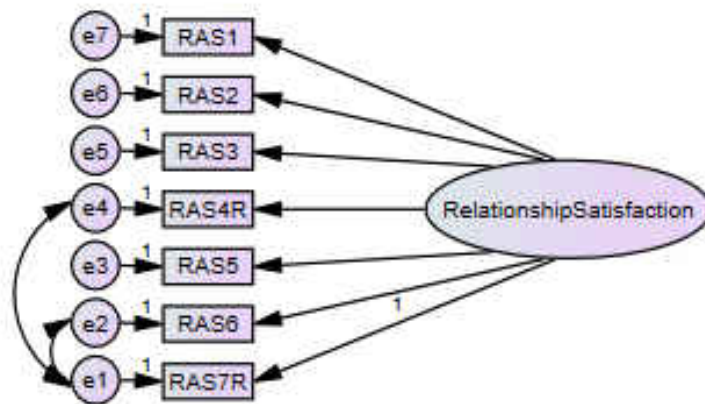


Figure 59: Modified Measurement Model - RAS

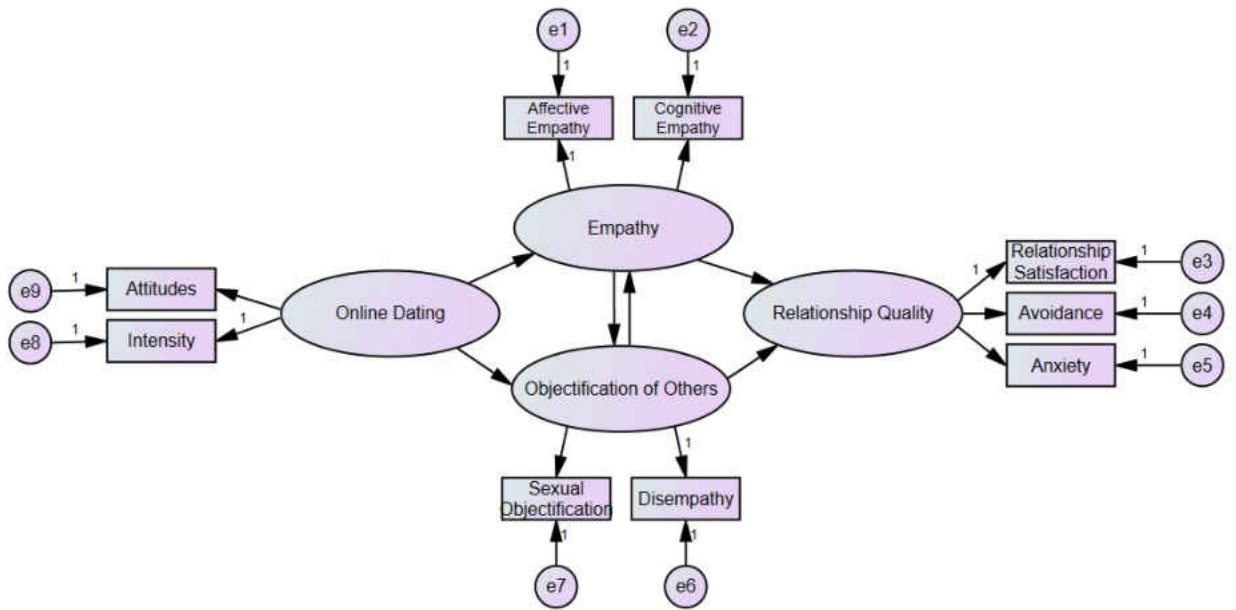


Figure 60: Revised Path Diagram of Structural Model to be Tested

Complete Measurement Model

The researcher examined the complete measurement model, which included all measurement models for each construct, to explore relationships between indicators and latent factors (Byrne, 2010; Schumacker & Lomax, 2010). The measurement model demonstrated good fit with these data. Therefore, the researcher did *not* modify the model (see Figure 61; see Table 34).

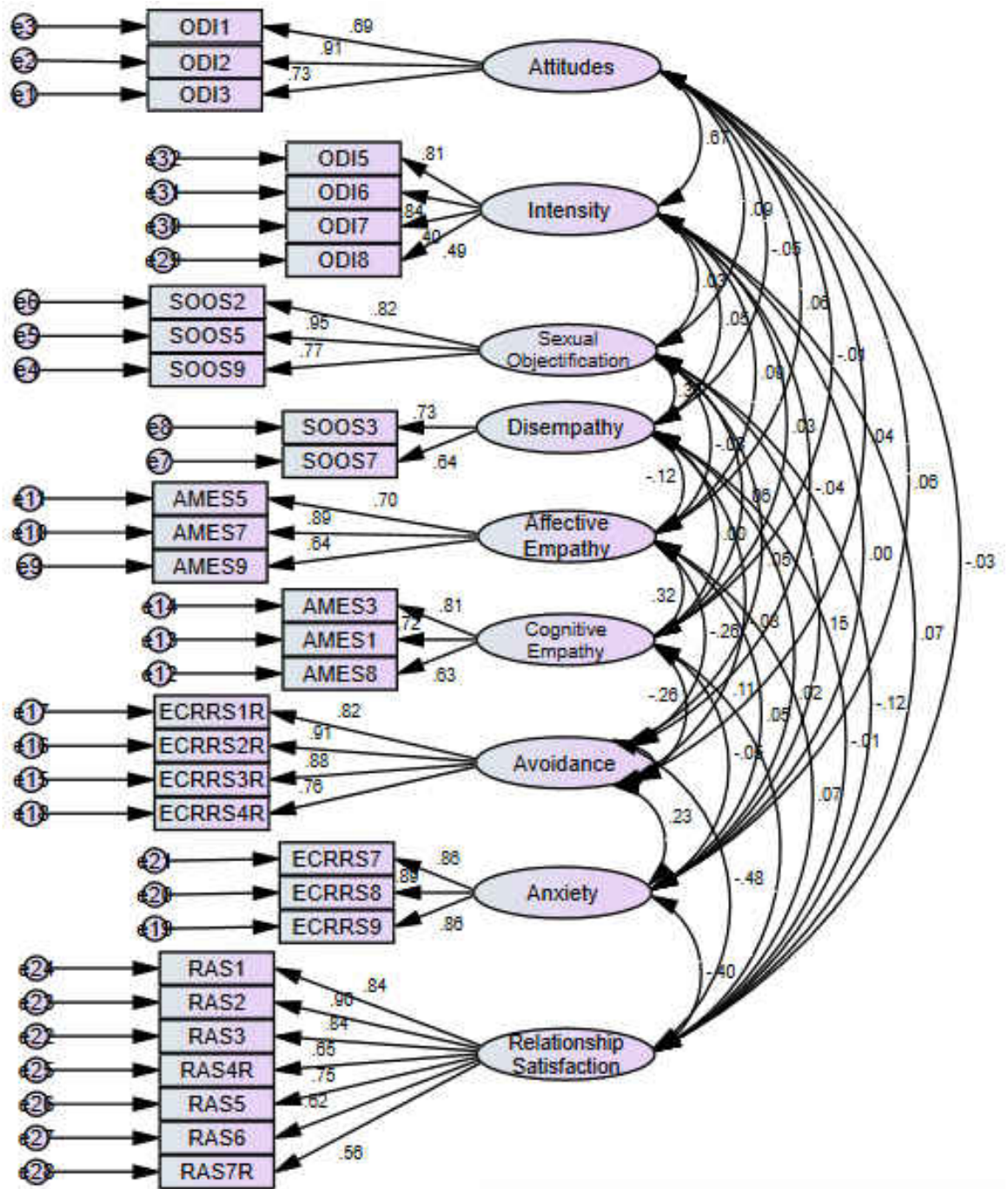


Figure 61: Complete Measurement Model

Table 34

Model Fit Indices for the Complete Measurement Model

	X^2	df	p	CMIN/ df	CFI	RMSEA	TLI
Theorized Measurement Model	1252.3	428	.000	2.926	.963	.035	.954

Note. The complete measurement model was estimated with ML due to the complexity and size of the model.

Data Screening and Statistical Assumptions for SEM

After modifying the measurement instruments used in this study, the researcher again screened data to assure that statistical assumptions were met (Hair et al., 2006; Osborne, 2013). Because the researcher did *not* omit any cases due to outliers or missing data, the researcher reviewed the adjusted instruments for (a) univariate and multivariate normality, (b) multicollinearity, (c) linearity between variables, and (d) homoscedasticity.

Univariate and multivariate normality. Normality refers to the normal (e.g., bell-shaped curve) or non-normal (e.g., skew, kurtosis) distribution of data. The researcher assessed for normality of modified subscales used in this investigation (e.g., *Intensity* [ODI], *Affective Empathy* [AMES], *Cognitive Empathy* [AMES], *Sexual Objectification* [SOOS], *Disempathy* [SOOS], and *Avoidance* [ECR-RS]). The researcher visually inspected Q-Q plots and histograms for these subscales and by conducted a Shapiro-Wilk W test (Tabachnick & Fidell, 2013). Despite the modifications made to the instruments, the researcher continued to observe positively and negatively skewed distributions with leptokurtic patterns and sufficient levels of non-normality with these data. Thus, the researcher determined non-normal distribution of data.

Table 35

Tests of Normality

Subscale	Shapiro-Wilk		
	Statistic	<i>df</i>	Sig.
ODI - <i>Attitudes</i>	.857	504	.000
ODI - <i>Intensity</i>	.755	504	.000
AMES – <i>Affective Empathy</i>	.975	1606	.000
AMES – <i>Cognitive Empathy</i>	.959	1611	.000
SOOS – <i>Sexual Objectification</i>	.965	1605	.000
SOOS - <i>Disempathy</i>	.967	1606	.000
ECR-RS <i>Anxiety</i> ¹	.841	1606	.000
ECR-RS <i>Avoidance</i>	.940	1604	.000
RAS	.934	1599	.000

Note. ¹Square root transformation.

Due to the non-normality of the data, the researcher conducted square root, logarithm, and inverse transformations to reduce severity of the non-normality (Tabachnick & Fidell, 2013). The researcher also considered the positive or negative tail of the skew and performed a reflection when necessary (Tabachnick & Fidell, 2013). The transformations that produced the least non-normal distribution are presented in Table 36.

Table 36

Transformations, Skewness and Kurtosis

Scale	Transformation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
ODI - <i>Attitudes</i>	none	.989	.109	.293	.217
ODI - <i>Intensity</i>	Logarithm	1.009	.109	-.008	.217
AMES - <i>Affective</i>	none	.005	.061	.241	.122
AMES - <i>Cognitive</i>	none	-.231	.061	.391	.122
SOOS – <i>Sexual Objectification</i>	none	-.039	.061	-.909	.122
SOOS - <i>Disempathy</i>	none	-.220	.061	-.624	.122
ECR-RS - <i>Anxiety</i>	Square root	.511	.061	-.402	.122
ECR-RS - <i>Avoidance</i>	Logarithm	.389	.061	-.719	.122
RAS	none	-.683	.061	-.260	.122

After performing various transformations, visual indicators of distribution patterns (e.g., histograms, Q-Q Plots) and values of skewness and kurtosis still revealed non-normal data (see Table 36). However, due to the large sample size, the influence of non-normal data is less significant than it is with smaller sample sizes (e.g., < 200; Tabachnick & Fidell, 2013). Due to the non-normality of these data, the researcher assumed multivariate non-normality as well (Hair et al., 2006). Thus, the researcher noted the impact of non-normal data distribution on the interpretation of the results in chapter 5. All analysis in future sections utilized the three transformed scales (*Intensity*, *Anxiety*, and *Avoidance*).

Multicollinearity. The researcher conducted correlations between independent variables and failed to identify problematic relationships (e.g., $r = .9$ or greater; Hair et al., 2006; Tabachnick & Fidell, 2013). The researcher also evaluated the Tolerance and

Variance Inflation Factor (VIF) per construct, and failed to identify tolerance values below .10 or VIF values above 10. Therefore, the researcher determined that multicollinearity was *not* present in these data.

Linearity between variables. Linearity refers to the nature of the relationship between variables (Tabachnick & Fidell, 2013). Researchers cautioned that nonlinear relationships might *not* be portrayed by Pearson's *r* (Tabachnick & Fidell, 2013). The researcher reviewed bivariate scatterplots to identify linear and non-linear relationships between variables and conducted an ANOVA to confirm non-linear relationships. Despite modifications to measurement models and data transformations, nonlinear relationships still exist with these data. Thus, the researcher addressed the potential influence of curve-linear relationships in the limitations section (see chapter 5).

Homoscedasticity. Homoscedasticity refers to the variance of scores on a measure (Hair et al., 2006). Due to the non-normality of these data, the researcher assumed the data were heteroscedastic (e.g., unequal variance). The researcher confirmed heteroscedasticity through a review of scatterplots. However, heteroscedasticity is *not* of primary concern as it relates to assumptions necessary to conduct SEM (Tabachnick & Fidell, 2013, p. 85). Therefore, the researcher did *not* manipulate the data to account for heteroscedasticity, and the researcher noted the potential impact of heteroscedasticity on the results in the discussion section (see chapter 5).

Adjusted Data Analyses

Upon completion of the data cleaning process, the researcher reanalyzed participants' scores across the data collection instruments. The following data analyses include the three transformed subscales (e.g., *Intensity*, *Anxiety*, and *Avoidance*). The measures of central tendencies of participants' scores are presented in Table 37.

Table 37

Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
ODI - <i>Attitudes</i>	1.88	.935	4	1.667	1
ODI - <i>Intensity</i> ¹	.145	.167	.65	.097	0
AMES - <i>Affective</i>	3.19	.784	4	3	3
AMES - <i>Cognitive</i>	3.84	.604	4	4	4
SOOS - <i>Sexual Objectification</i>	3.37	1.397	5	3.67	4
SOOS - <i>Disempathy</i>	3.67	1.311	5	4	4
ECR-RS - <i>Anxiety</i> ²	.240	.206	.85	.243	0
ECR-RS - <i>Avoidance</i> ¹	1.42	.338	1.65	1.414	1
RAS	3.85	.921	4	4	5

Note. ¹Logarithmic transformation. ²Square root transformation.

Quality of romantic relationships. In addition to the transformed subscale scores, the researcher also utilized a composite score to measure participants' quality of romantic relationships. As delineated in the measurement model for quality of romantic relationships (see Figure 54), the researcher calculated a composite score based on participants' scores on the revised ECR-RS subscales and the RAS. Because higher scores on the ECR-RS subscales indicated greater levels of attachment anxiety and attachment avoidance, whereas higher scores on the RAS indicated greater relationship satisfaction, the researcher calculated reversed scores of the ECR-RS to be congruent

with the direction of RAS scores. Specifically, to quantify a composite score for quality of romantic relationships, the researcher composed a total score for the RAS and the reflected scores of the ECR-RS subscales (e.g., multiplied by -1) so that greater scores represent greater levels of relationship satisfaction and the lower levels of attachment avoidance and attachment anxiety. Scores ranged from -2.10, which indicated low levels of relationship satisfaction and lower levels of secure attachment, to 4.0, which indicated great levels of relationship satisfaction and secure attachment. The measures of central tendencies for the composite measure of quality of romantic relationships are presented in Table 38.

Table 38

Quality of Romantic Relationships Measures of Central Tendencies

Scale	Mean (<i>M</i>)	<i>SD</i>	Range	<i>Mdn</i>	Mode
<i>Quality of Romantic Relationships Composite Score^a</i>	2.18	1.27	6.10	2.30	4

Note. ^a*n* = 1,590. Due to pairwise deletion, sample sizes varied per measurement.

Analysis of the Research Hypothesis and Exploratory Questions

This investigation examined the influence of online dating on emerging adults' levels of empathy, objectification of others, and quality of romantic relationships. The data used in this study were analyzed using the *Statistical Package for the Social Science* (SPSS, Version 21) and the *Analysis of Moment Structures* (AMOS, Version 21). The researcher employed the following statistical analyses in this examination, (a) SEM, (b) descriptive statistics, (c) Pearson's correlations, (d) multiple regressions, and (e)

ANOVA. The researcher also utilized Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to conduct SEM. In the following sections, the author presents the resulting data analyses for the primary and exploratory research questions.

Research Hypothesis and Exploratory Research Questions

The purpose of this investigation was to examine the directional relationship between emerging adults' use of online dating services (e.g., websites and applications), levels of empathy and objectification of others, and quality of relationships with romantic partners. The researcher utilized SEM and Pearson's correlation to address the research hypothesis. To conduct SEM, the researcher followed the five steps outlined by Schumacker and Lomax (2010) including (a) model specification, (b) model identification, (c) model estimation, (d) model testing, and (e) model modification.

Primary research question. Do emerging adults' use of online dating websites and applications (as measured by the ODI) contribute to their levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS, and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988])?

Research hypothesis. Emerging adults' intensity of use of online dating services (as measured by the ODI) contributes to levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS), and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011])

and RAS [Hendrick, 1988]). Specifically, emerging adults' greater intensity of online dating service use contributes to (a) decreased levels of empathy, (b) increased levels of objectification of others, and (c) decreased quality of relationships with romantic partners (see Figure 60).

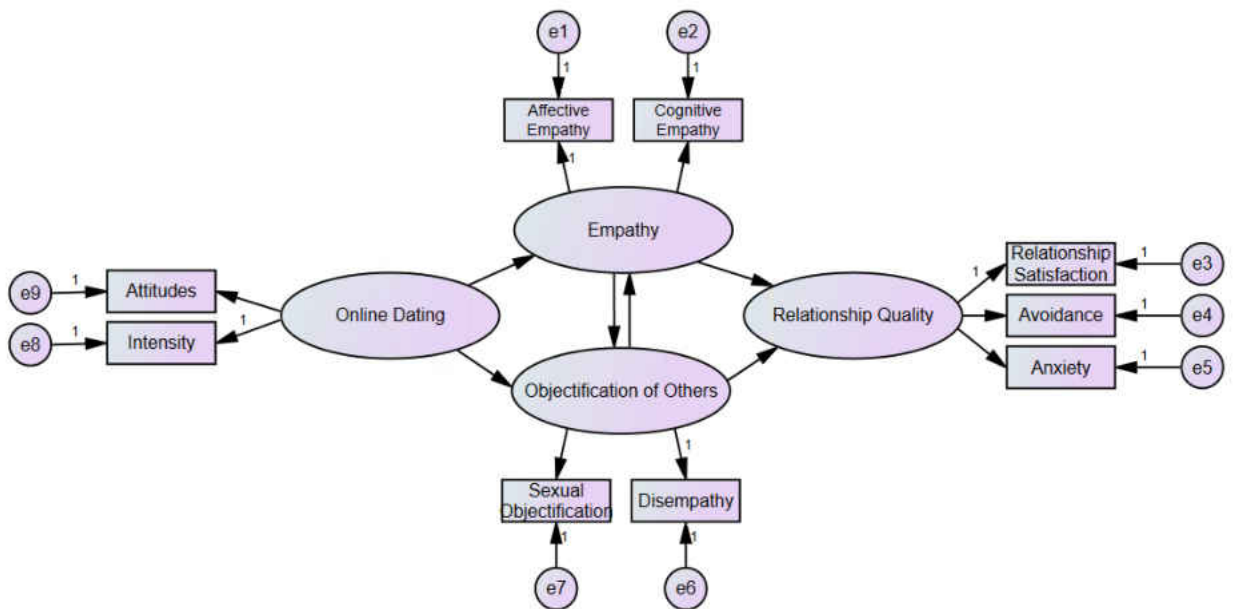


Figure 60: *Modified Path Diagram of Structural Model to be Tested*

Structural model. The researcher specified the hypothesized structural model (see Figure 60) based on the measurement models (see Figures 55-59). Online dating was defined as an exogenous (i.e., independent) latent variable composed of two subscale factors of the ODI – *Attitudes* and *Intensity*. Empathy was included as a partial mediation variable (i.e., a latent variable tested as both endogenous/dependent and exogenous/independent variable). Empathy was measured by two factors of the AMES – *Affective Empathy* and *Cognitive Empathy*. The objectification of others was also included as a partial mediation variable as measured by the two factor scores of the

SOOS – *Sexual Objectification and Disempathy*. Relationship quality was defined as an endogenous (i.e., dependent) variable composed of relationship satisfaction scores of the RAS and two factors of the ECR-RS – *Avoidance* and *Anxiety*. The researcher hypothesized that online dating would negatively influence empathy and positively influence the objectification of others, while empathy and other-objectification would share a two-way relationship, and empathy would positively influence relationship quality, while objectification of others would negatively influence relationship quality. Due to the size and complexity of the model, the researcher utilized composite scores for the measurement instruments and employed ML to estimate the hypothesized model (Kline, 2011).

The initial hypothesized model was *underidentified* and was unable to converge upon a solution. An under-identified model “[...] is one in which the number of parameters to be estimated exceeds the number of variances and covariances (i.e., data points)” (Byrne, 2010, p. 34). An underidentified model can be amended through the addition or subtraction of fixed parameters (Byrne, 2010). Byrne (2010) recommended that researchers constrain a nonzero value to one factor for each independent and dependent latent variable. Researchers need a just- or over-identified model to conduct SEM, in which a just-identified model has parameters that are “uniquely determined” and an over-identified model has more than enough information to provide multiple ways of estimating parameters (Schumacker & Lomax, 2010, p. 57). Byrne (2010) recommended pursuing an overidentified model as opposed to a just-identified model. Therefore, through the setting and freeing of parameters, the researcher identified three structural

models that met criteria for overidentification and nearly met or exceeded the minimum thresholds for good model fit (see Figures 62-64; see Table 39).

In the first model, the researcher added a 1.0 constraint between the latent variables of online dating on empathy, online dating on objectification of others, objectification of others on empathy, and objectification of others on relationship quality. The data minimally supported Hypothesized Model 1. Furthermore, several standardized regression weights ($n = 4$) failed to meet the .4 threshold (Stevens, 1996). In the second model, the researcher added an additional 1.0 constraint between the latent variable of empathy on relationship quality. The data exemplified a minimal improvement with this model (Hypothesized Model 2); however, several standardized regression weights ($n = 4$) still failed to meet the .4 threshold (Stevens, 1996). In the third version of the hypothesized model, the researcher removed the 1.0 constraint between objectification of others on empathy and between objectification of others on relationship quality. The researcher also added a 1.0 constraint between empathy on objectification of others. The data did *not* support this model (Hypothesized Model 3), as negative error variances occurred on the *Attitudes* factor for the latent variable of online dating. Furthermore, despite the strong fit indices, multiple standardized regression weights ($n = 5$) failed to meet the .4 threshold (Stevens, 1996). After a review of the standardized regression weights and fit indices of the three models, the researcher deemed Hypothesized Model 2 to be the strongest and most parsimonious with these data. For Hypothesized Model 2, the fit indices for both CFI ($> .9$) and RMSEA ($< .08$) met criteria for acceptable model fit, and Hypothesized Model 2 included the greatest amount of degrees of freedom (26)

compared to the other two hypothesized model, which also supports that this is the strongest version of the hypothesized models.

Table 39

Model Fit Indices for the Overidentified Hypothesized Model

	X^2	df	p	CMIN/ df	CFI	RMSEA	TLI
Hypothesized Model 1	278.923	25	.000	11.157	.934	.079	.881
Hypothesized Model 2	278.933	26	.000	10.728	.934	.078	.886
Hypothesized Model 3	142.261	25	.000	5.690	.969	.054	.945

Note. The complete measurement model was estimated with ML due to the complexity and size of the model.

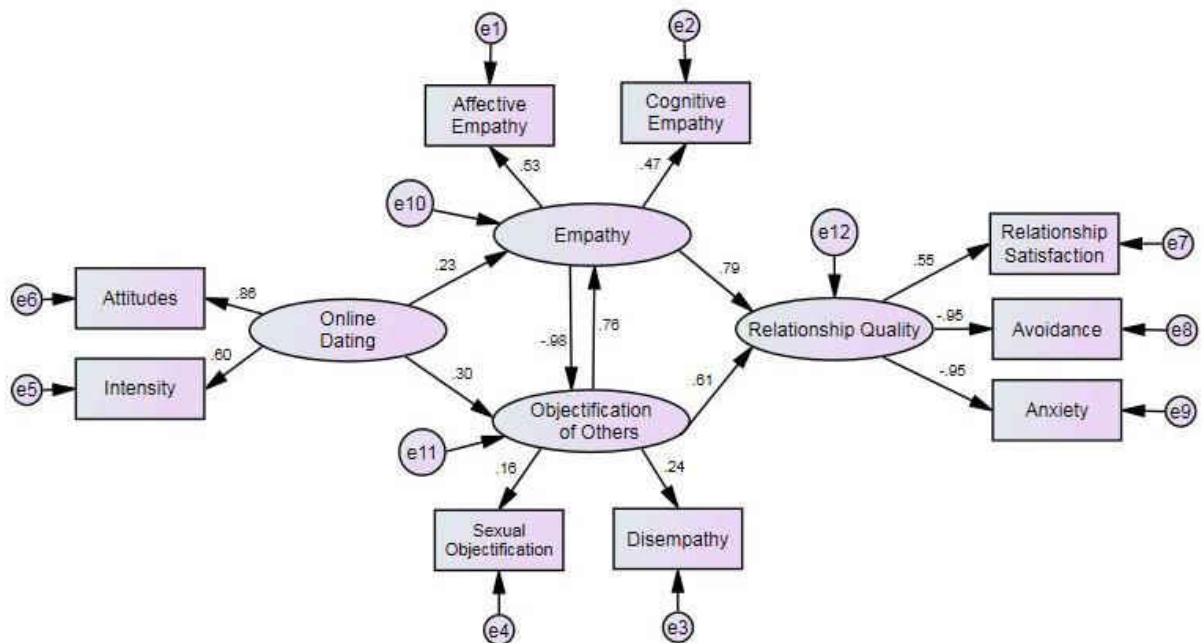


Figure 62: Hypothesized Structural Model 1

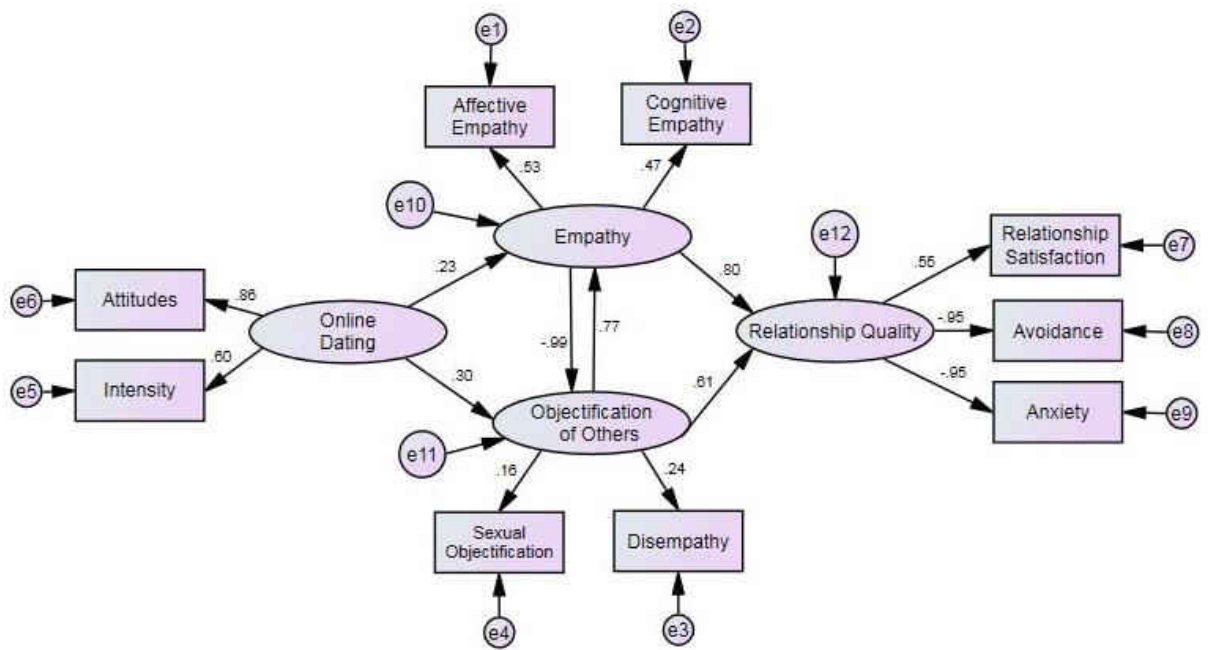


Figure 63: Hypothesized Structural Model 2

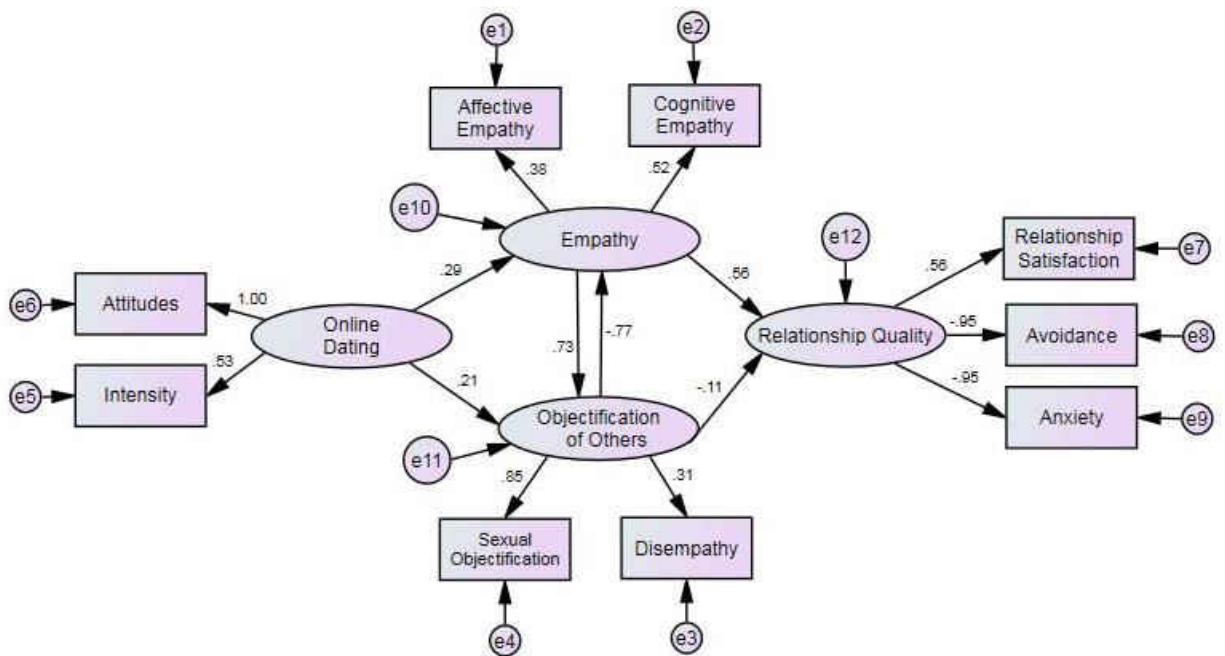


Figure 64: Hypothesized Structural Model 3

The modifications made to Hypothesized Model 2 ($p < .001$) through the addition and subtraction of constraints to the latent variables produced the strongest model fit with these data $X^2(25, N = 1,613) = 278.933$, $CMIN/df = 10.728$, $CFI = .934$, $RMSEA = .078$, and $TLI = .886$. According to this model, participants' use of online dating accounted for 5.3% (standardized coefficient = .23) of the variance for empathy and 9% (standardized coefficient .30) of the variance for objectification of others. Individuals' levels of empathy shared a strong negative relationship (standardized coefficient = -.99) with their levels of objectification of others (98% of the variance accounted for). In contrast, individuals' level of objectification of others was positively related to empathy (standardized coefficient = .77; 59.3% of the variance accounted for). Furthermore, individuals' level of objectification of others accounted for 37% (standardized coefficient = .61) of the variance for relationship quality, and individuals' level of empathy accounted for 64% (standardized coefficient = .80) of the variance for relationship quality. However, it is necessary to note that these results need to be interpreted with caution due to non-normal data and the low factor loading (e.g., $< .20$; Kline, 2011) of *Sexual Objectification* factor on the latent variable of objectification of others.

Follow Up Analyses

The researcher conducted additional analyses to investigate alternative models and model fit. Researchers recommend the examination of equivalent and alternate models that fit the same data set (Kline, 2011). Specifically, Kline (2011) recommended identifying a final retained model that (a) possesses theoretical rationale, (b) distinguishes

between what is known and unknown, and (c) allows researchers to pose new questions for further investigation. Therefore, the researcher examined several alternative models with these data.

The researcher noted the contrasting relationships between participants' levels of empathy and objectification of others. In some models, empathy was negatively related to objectification of others while objectification of others positively related to empathy, whereas other models identified positive relationships between empathy and objectification of others and negative relationships between objectification of others and empathy. Therefore, the researcher tested several models (Modified Models 1, 2, and 3; see Figures 65-67) where the directional relationship from objectification of others to empathy was removed. The researcher also tested additional models where the directional relationship from empathy to objectification of others was removed instead (Modified Models 4, 5, and 6; see Figures 68- 70).

The researcher manipulated the models through the setting and removing of 1.0 constraints between constructs. In Modified Model 1 and Modified Model 6, the researcher placed 1.0 constraints between online dating and objectification of others, objectification of others and relationship quality, and empathy and relationship quality. In Modified Model 2, the researcher placed 1.0 constraints between online dating and empathy, and between both empathy and objectification of others on relationship quality. Modified Model 3 and Modified Model 4 include 1.0 constraints between online dating on empathy and on objectification of others, and an additional constraint between empathy on relationship quality. Modified Model 5 includes 1.0 constraints between

online dating on empathy as well as objectification of others, a 1.0 constraint between objectification of others on empathy, and a 1.0 constraint between empathy and relationship quality. The fit indices of these models are delineated in Table 40.

Table 40

Model Fit Indices for Modified Models

	X^2	<i>df</i>	<i>p</i>	CMIN/ <i>df</i>	CFI	RMSEA	TLI
Modified Model 1 ^a	266.185	25	.000	10.647	.937	.077	.887
Modified Model 2 ^a	248.832	25	.000	9.953	.942	.075	.895
Modified Model 3 ^a	156.168	25	.000	6.247	.966	.057	.938
Modified Model 4 ^b	155.909	25	.000	6.236	.966	.057	.939
Modified Model 5 ^b	271.402	26	.000	10.439	.936	.077	.889
Modified Model 6 ^b	233.008	25	.000	9.320	.946	.072	.902

Note. The complete measurement model was estimated with ML due to the complexity and size of the model. ^aThe model was modified by the removal of the directional relationship between objectification of others on empathy. ^bThe model was modified by the removal of the directional relationship between empathy on objectification of others. Modified Model 1 included 1.0 constraints between online dating and objectification of others, objectification of others and relationship quality, and empathy and relationship quality. Modified Model 2 included 1.0 constraints between online dating and empathy, and between both empathy and objectification of others on relationship quality. Modified Model 3 included 1.0 constraints between online dating on empathy and on objectification of others, and an additional constraint between empathy on relationship quality. Modified Model 4 included 1.0 constraints between online dating on empathy and on objectification of others, and an additional constraint between empathy on relationship quality. Modified Model 5 included 1.0 constraints between online dating on empathy as well as objectification of others, a 1.0 constraint between objectification of others on empathy, and a 1.0 constraint between empathy and relationship quality. Modified Model 6 included 1.0 constraints between online dating and objectification of others, objectification of others and relationship quality, and empathy and relationship quality.

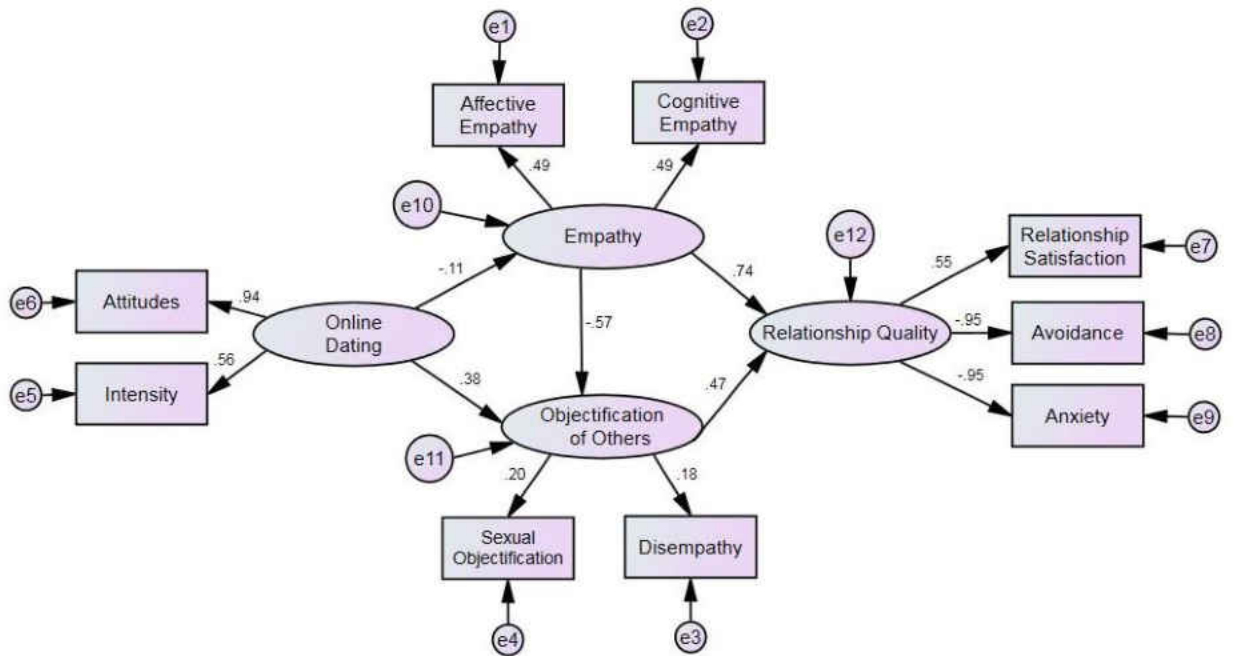


Figure 65: Modified Model 1 - Objectification of Others on empathy Removed

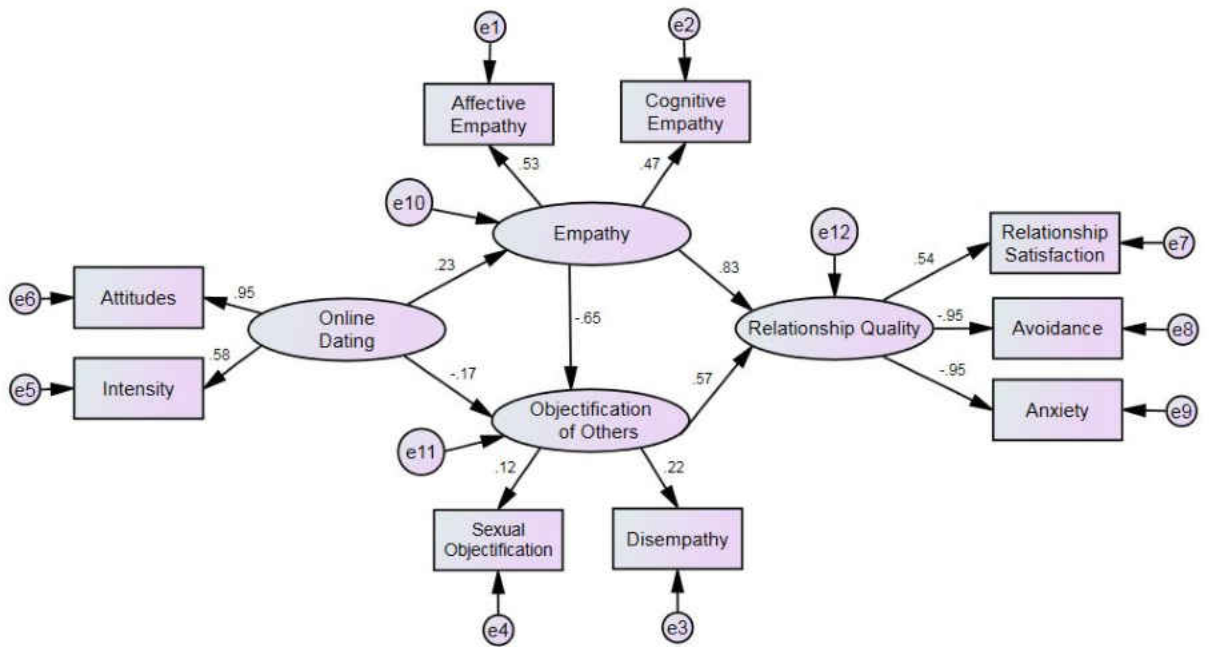


Figure 66: Modified Model 2 - Objectification of Others on Empathy Removed

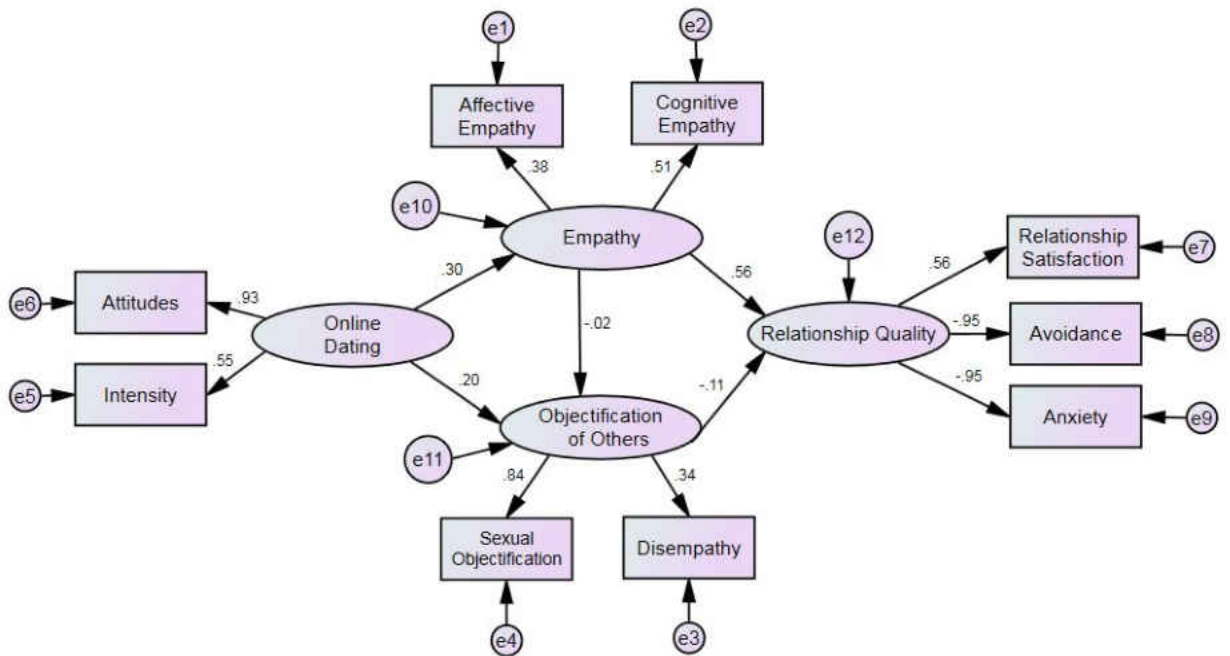


Figure 67: Modified Model 3 - Objectification of Others on Empathy Removed

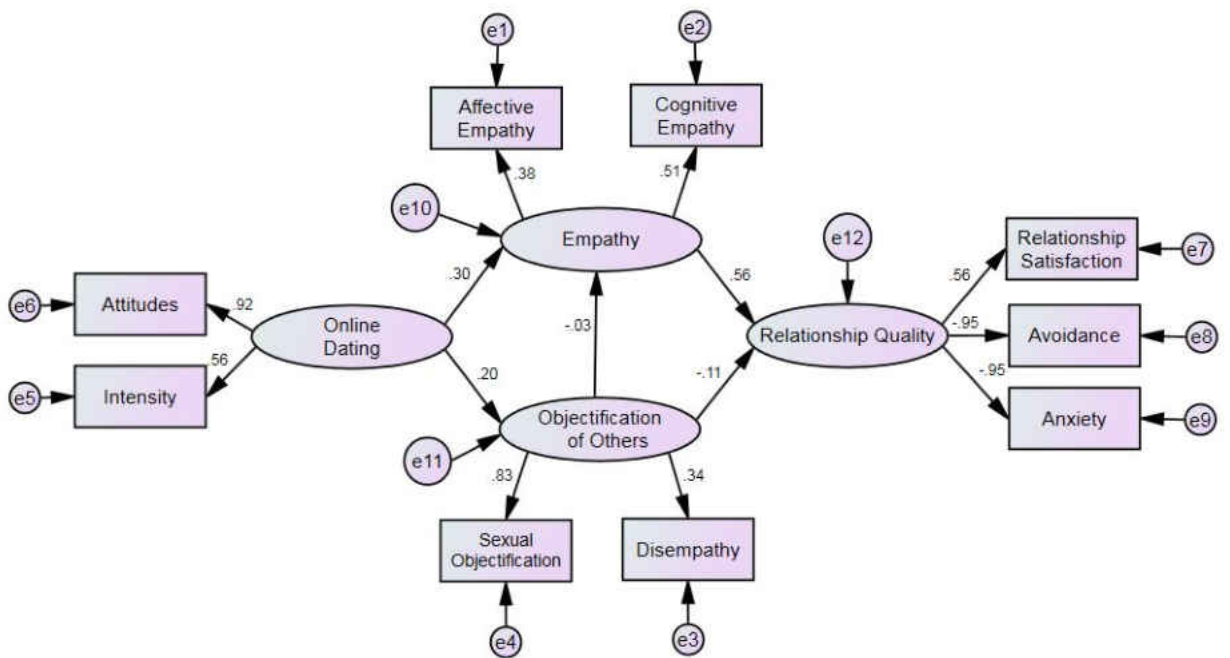


Figure 68: Modified Model 4 - Empathy on Objectification of Others Removed

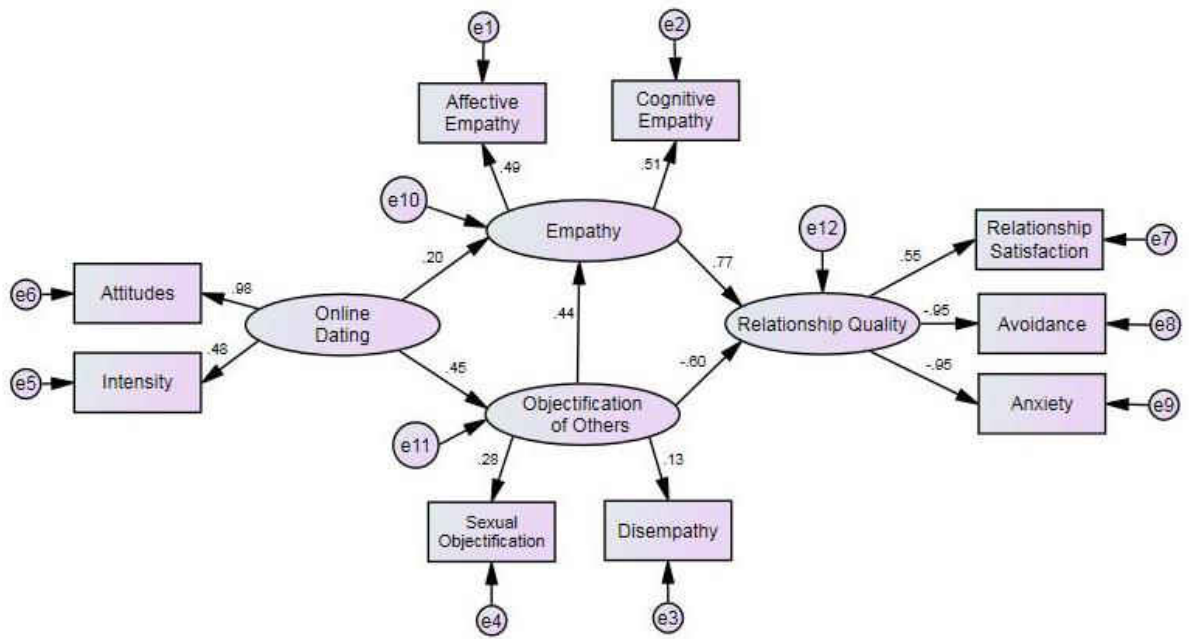


Figure 69: Modified Model 5 - Empathy on Objectification of Others Removed

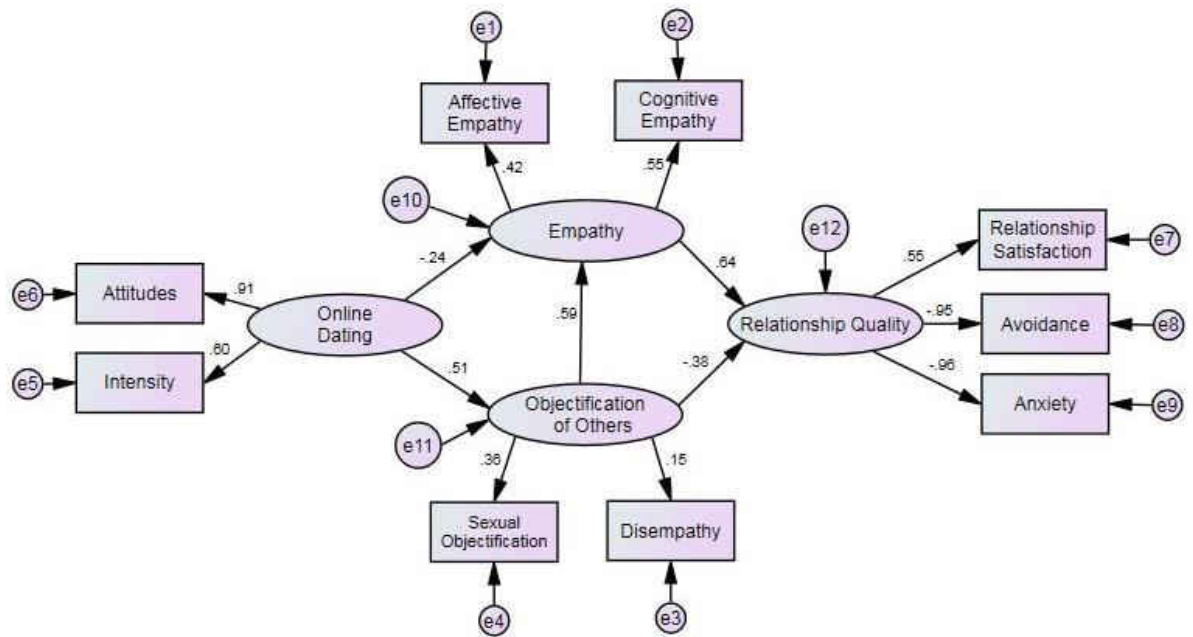


Figure 70: Modified Model 6 - Empathy on Objectification of Others Removed

A review of the fit indices and models tested indicated that Modified Model 3 and Modified Model 4 performed best with these data. Modified Model 3 was statistically significant ($p < .001$) and presented with good model fit with these data, $X^2(25, N = 1,613) = 156.168$, $CMIN/df = 6.247$, $CFI = .966$, $RMSEA = .057$, and $TLI = .938$. Similarly, Modified Model 4 was also statistically significant ($p < .001$) and presented with a model that fit with these data well, $X^2(25, N = 1,613) = 155.909$, $CMIN/df = 6.236$, $CFI = .966$, $RMSEA = .057$, and $TLI = .939$. Both models included constraints between the constructs of online dating on Empathy, online dating on objectification of others, and empathy on relationship quality. While both models possessed similar loadings, model three included a directional relationship between empathy and

objectification of others, whereas model four included the inverse relationship (i.e., objectification of others and empathy). Both models exhibited acceptable model fit compared to the second modified version of the full structural model and presented with greater factor loadings on the objectification of others factor. It is noteworthy that Modified Model 3 and Modified Model 4 identified a negative relationship between empathy and objectification of others (< 1% of the variance accounted for), and Modified Model 3 and Modified Model 4 identified objectification of others as negatively relating to quality of romantic relationships and accounting for 1.2% of the variance (standardized coefficient = -.11), which is negligible (Cohen, 1988).

In addition to examining the relationship between empathy and objectification of others, the researcher recognized the low influence of online dating on empathy and objectification of others across models. Thus, the researcher opted to explore an alternate model that removed the latent construct of online dating as measured by the ODI and replaced it with a manifest dichotomous variable of whether or not a participant used online dating. If a participant reported using online dating in the past or present, the researcher identified that participant as an online dater. The researcher examined several models using online dating status as opposed to the latent online dating factor, including models that incorporated the two-way relationship between empathy and objectification of others (see Figures 71-72), and also models with only the directional relationship of empathy on objectification of others (see Figures 73-74) as well as models with only the directional relationship of objectification of others on empathy (see Figures 75-76).

Variance between models results from the addition or subtraction of constraints between models. Alternative Model 1 included 1.0 constraints between online dating and objectification of others, empathy and objectification of others, and empathy and relationship quality. Alternative Model 2 and Alternative Model 4 included 1.0 constraints between online dating and objectification of others, and between empathy and objectification of others. Alternative Model 3 included 1.0 constraints between empathy and objectification of others, and between empathy and relationship quality. Alternative Model 5 included only one 1.0 constraint between objectification of others and empathy. Lastly, Alternative Model 6 included 1.0 constraints between objectification of others and empathy, and between empathy and relationship quality. The fit indices of these alternative models are delineated in Table 41.

Table 41

Model Fit Indices for Alternative Models

	X^2	<i>df</i>	<i>p</i>	CMIN/ <i>df</i>	CFI	RMSEA	TLI
Alternative Model 1 ^a	260.515	18	.000	14.473	.934	.091	.869
Alternative Model 2 ^a	229.368	17	.000	13.492	.943	.088	.878
Alternative Model 3 ^b	172.220	18	.000	9.568	.958	.073	.917
Alternative Model 4 ^b	301.215	18	.000	16.734	.923	.099	.847
Alternative Model 5 ^c	194.491	17	.000	11.441	.952	.080	.898
Alternative Model 6 ^c	213.043	18	.000	11.836	.947	.082	.894

Note. The complete measurement model was estimated with ML due to the complexity and size of the model. ^aThe model included the two-way relationship between empathy and objectification of others. ^bThe model was modified by the removal of the directional relationship of objectification of others on empathy. ^cThe model was modified by the removal of the directional relationship of empathy on objectification of others.

Alternative Model 1 included 1.0 constraints between online dating and objectification of others, empathy and objectification of others, and empathy and relationship quality.

Alternative Model 2 included 1.0 constraints between online dating and objectification of others, and between empathy and objectification of others. Alternative Model 3 included 1.0 constraints between empathy and objectification of others, and between empathy and relationship quality. Alternative Model 4 included 1.0 constraints between online dating and objectification of others, and between empathy and objectification of others.

Alternative Model 5 included a 1.0 constraint between objectification of others and empathy. Alternative Model 6 included 1.0 constraints between objectification of others and empathy, and between empathy and relationship quality.

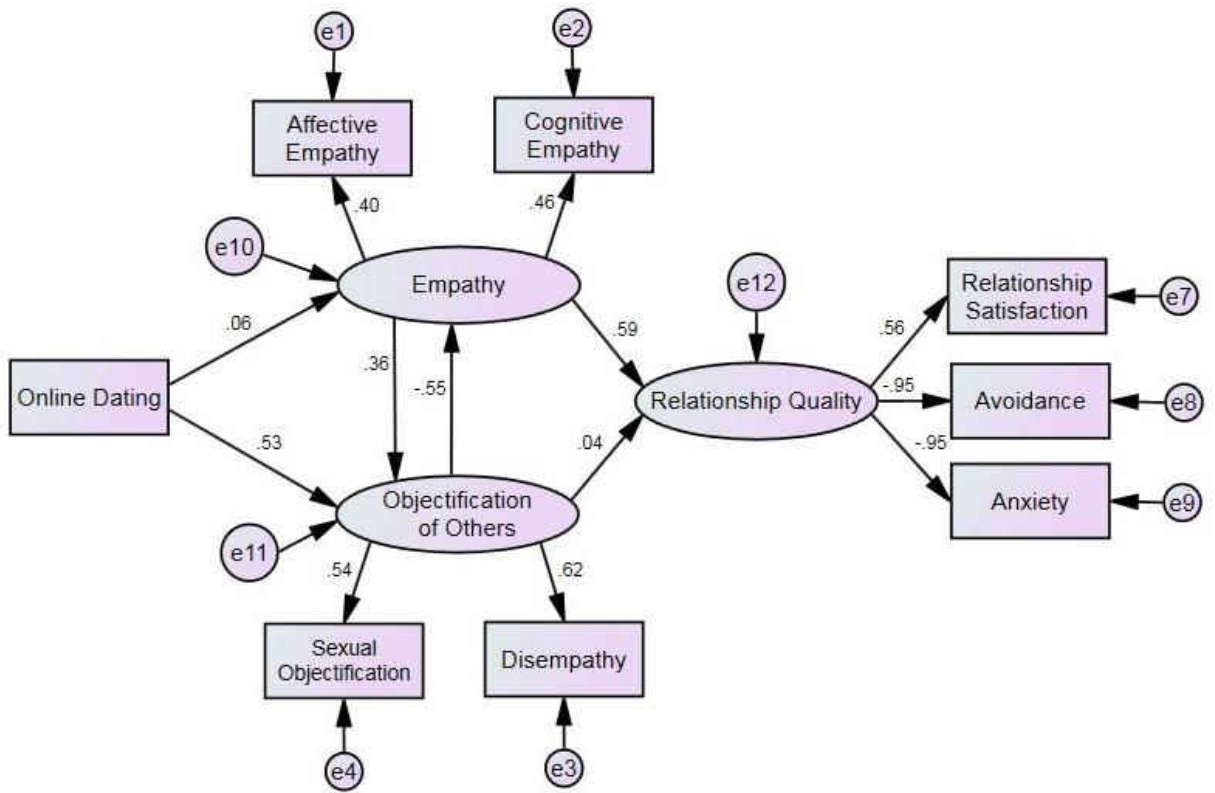


Figure 71: Alternative Structural Model 1

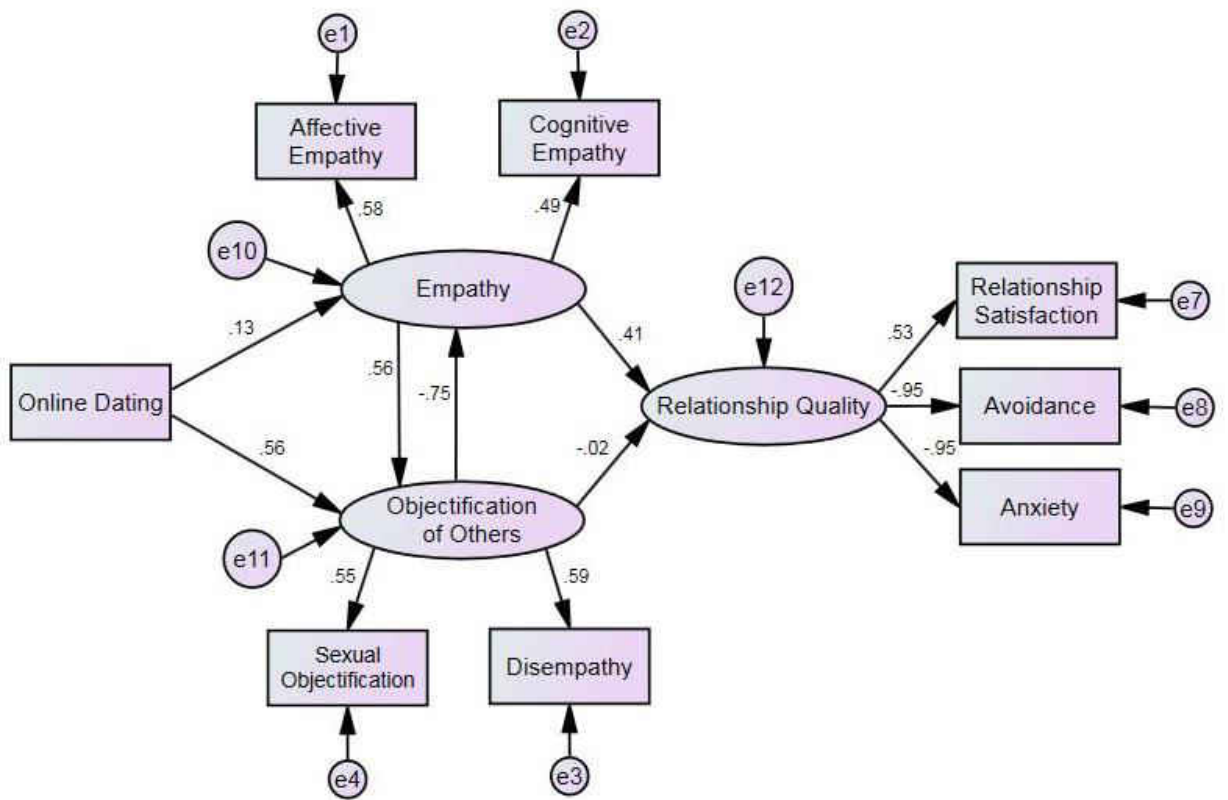


Figure 72: Alternative Structural Model 2

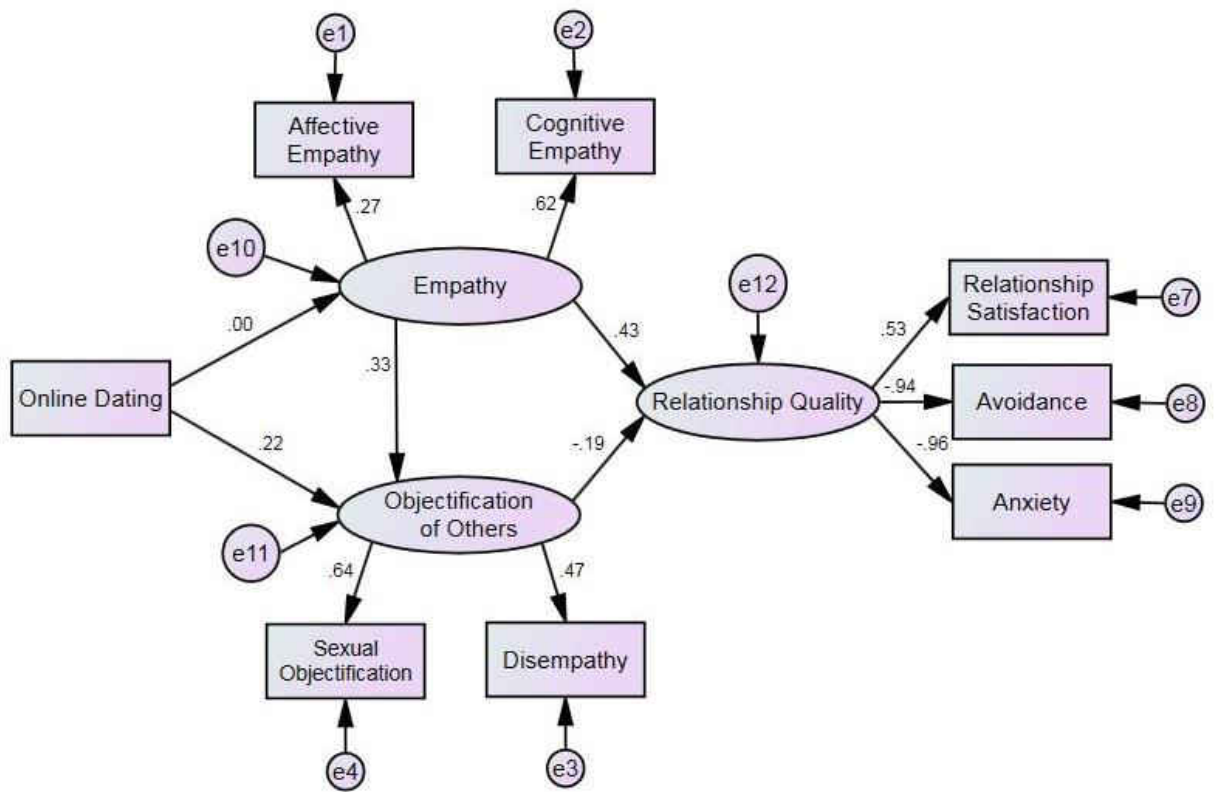


Figure 73: Alternative Structural Model 3 - Objectification of Others on Empathy

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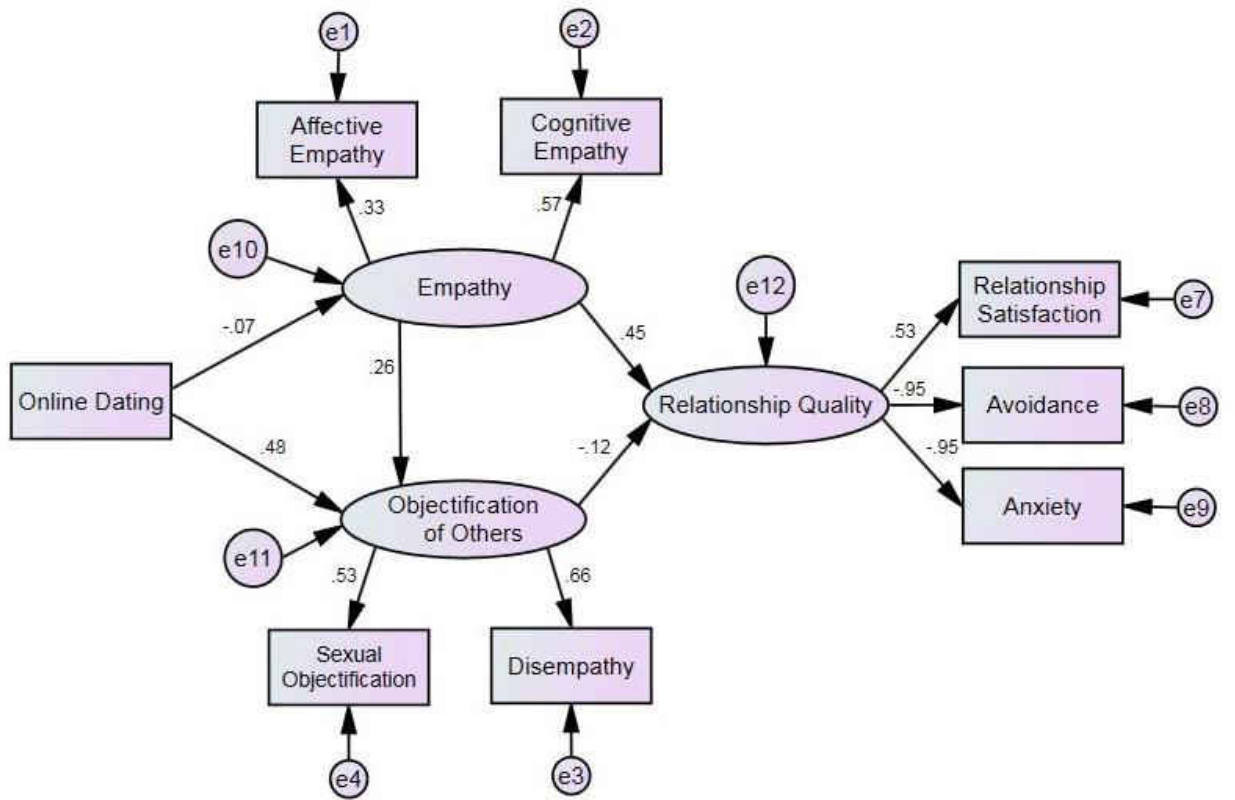


Figure 74: Alternative Structural Model 4 - Objectification of Others on Empathy

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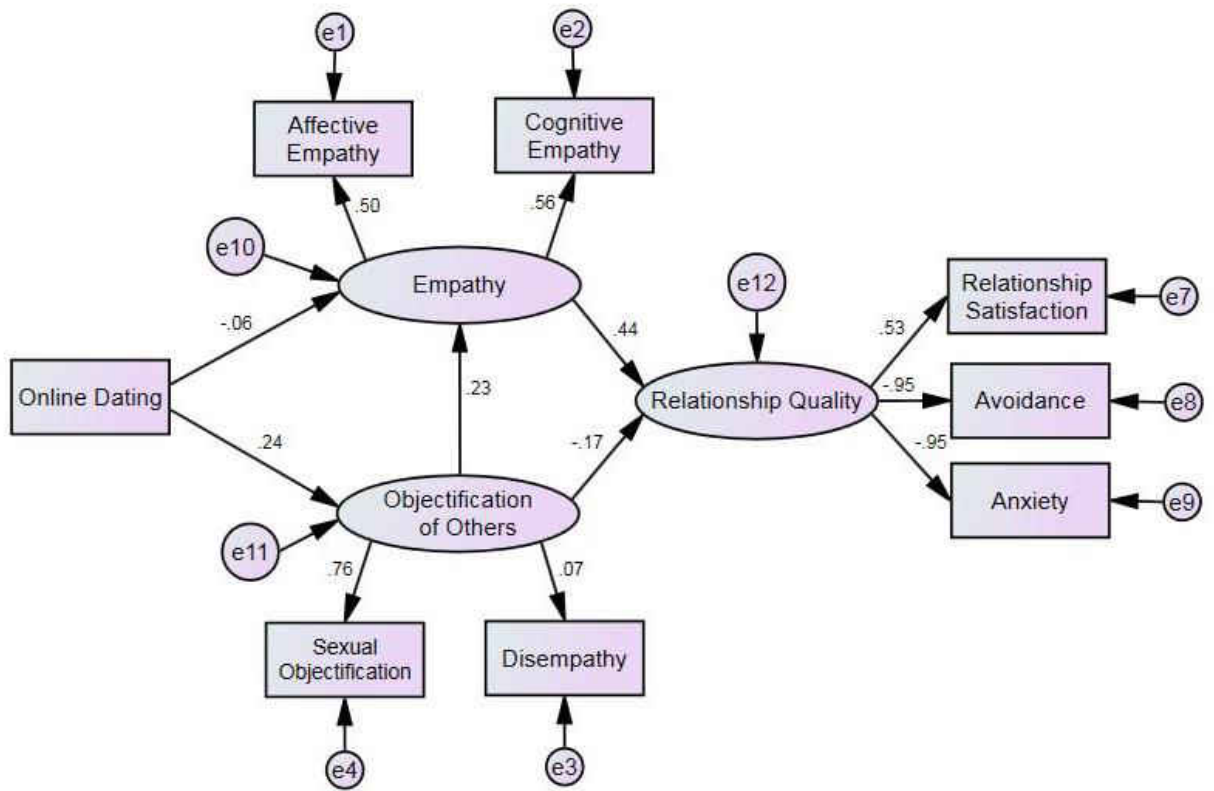


Figure 75: Alternative Structural Model 5 - Empathy on Objectification of Others

Removed

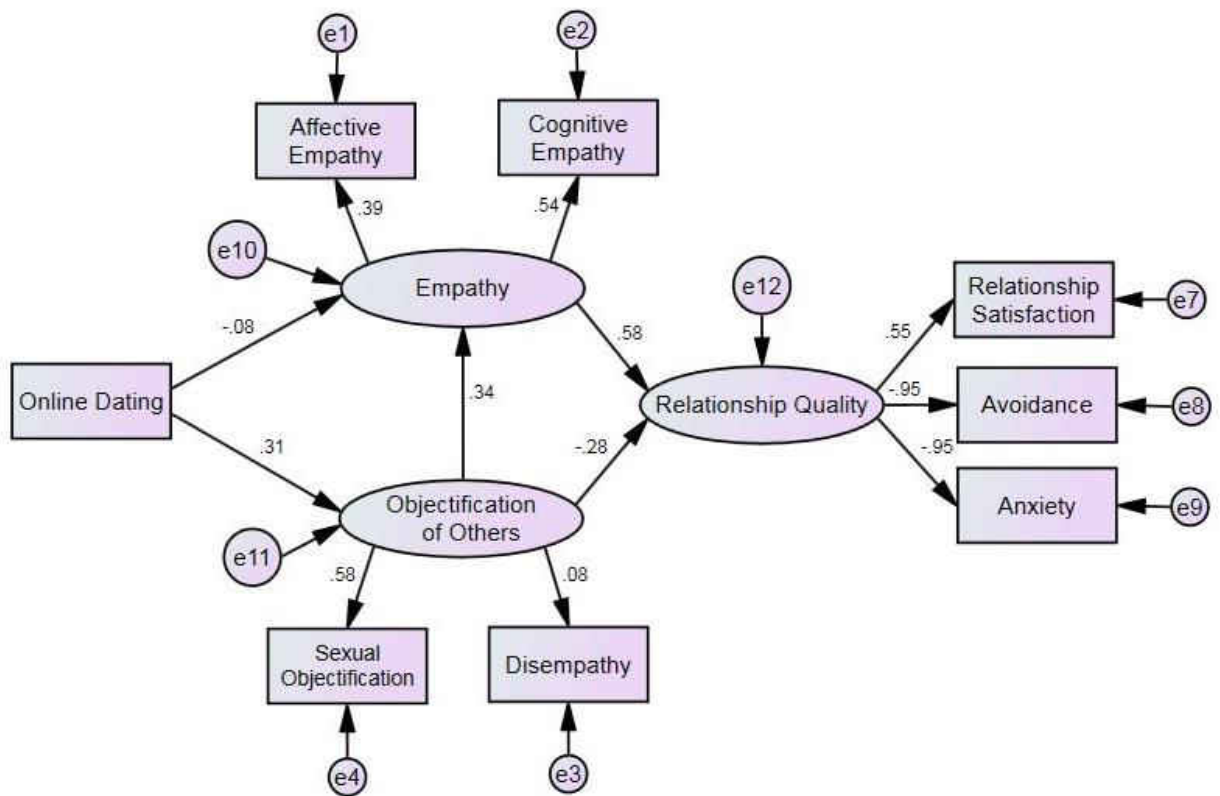


Figure 76: Alternative Structural Model 6 - Empathy on Objectification of Others

Removed

The alternative models ($p < .001$) did *not* perform well with these data. However, of the alternative models, Alternative Model 3, which did *not* include the directional relationship of objectification of others on empathy, produced the best model fit with these data $X^2(18, N = 1,613) = 172.220$, $CMIN/df = 9.568$, $CFI = .958$, $RMSEA = .073$, and $TLI = .917$. In this model, the researcher added a 1.0 constraint between the latent variables of empathy on objectification of others, and on empathy on relationship quality. By this model, online dating was unrelated to empathy ($r = .00$) and accounted for 4.8% (standardized coefficient = $.22$) of the variance for objectification of others. Empathy

positively related to objectification of others and accounted for 10.9% (standardized coefficient = .33) of the variance for objectification of others. Empathy also accounted for 18.5% (standardized coefficient = .43) of the variance of relationship quality, whereas objectification of others negatively related to relationship quality and accounted for 3.6% (standardized coefficient -.19) of the variance. While this model was the strongest fit of the alternative models, the researcher deemed it to be a poorer fitting model compared to Modified Models 3 and 4 (see Figures 67-68, Table 40).

Due to the inconsistency of loading on the objectification of others factor, the researcher considered errors in instrumentation. Specifically, due to the disempathy factor only containing two items (Hair et al., 2010), the relatively unexplored psychometric properties of the SOOS, and the poor internal consistency reliability of the SOOS with these data, the researcher considered that the objectification of others latent variable might have questionable psychometric features with these data. Therefore, the researcher removed the construct of objectification of others and reexamined structural model with these data (see Figures 77 and 78). Replacement Model 1 contained a 1.0 constraint between online dating on empathy and a 1.0 constraint between empathy on relationship quality. Replacement Model 2 did *not* contain a 1.0 constraint between empathy and relationship quality. The fit indices for these two replacement models are presented in Table 42.

Table 42

Model Fit Indices for the Alternative Models - Objectification of Others Removed

	X^2	df	p	CMIN/ df	CFI	RMSEA	TLI
Replacement Model 1	110.232	14	.000	7.874	.974	.065	.948
Replacement Model 2	74.912	13	.000	5.762	.983	.054	.964

Note. The complete measurement model was estimated with ML due to the complexity and size of the model.

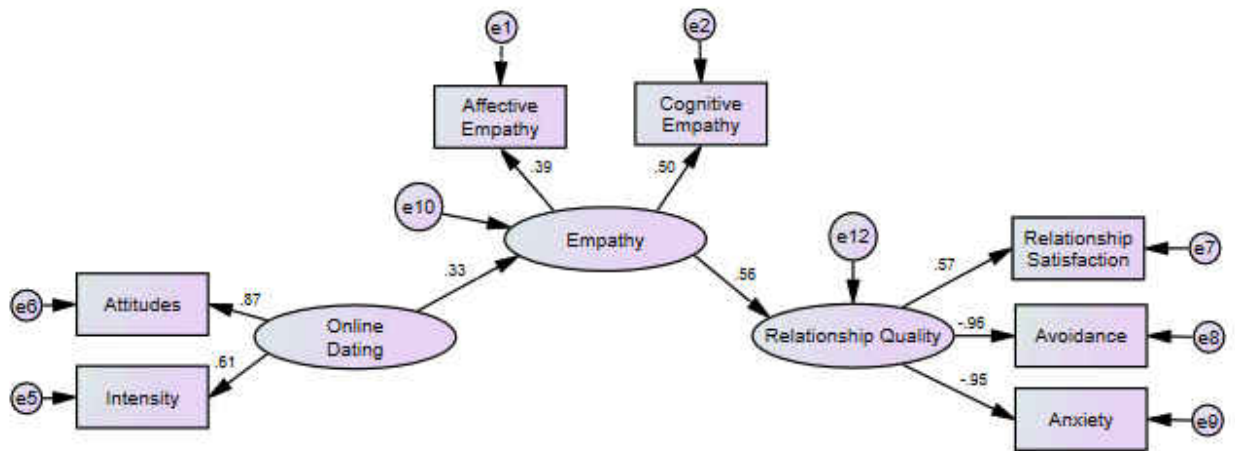


Figure 77: Replacement Model 1 - Objectification of Others Removed

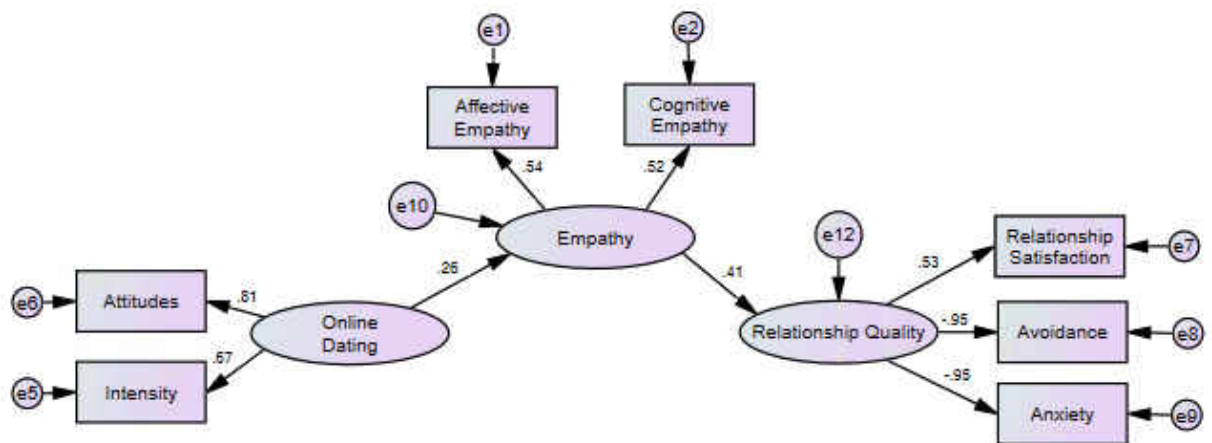


Figure 78: Replacement Model 2 - Objectification of Others Removed

Both replacement models ($p < .001$) performed well with these data. However, Replacement Model 2 fit the data better than Replacement Model 1 $X^2(13, N = 1,613) = 74.912$, $CMIN/df = 5.762$, $CFI = .983$, $RMSEA = .054$, and $TLI = .964$. Replacement Model 2 indicated that online dating accounted for 6.8% (standardized coefficient = .26) of the variance for empathy. Empathy accounted for 16.8% (standardized coefficient = .41) of the variance for relationship quality. This model presented as having the strongest fit compared to all other models with these data. Because the model fit the data better without the inclusion of the SOOS, the researcher explored additional alternative replacement models that again removed the latent construct of online dating and instead used participants' status as having used online dating as a manifest variable (see Figures 79-82).

The researcher explored the addition and removal of constraints between latent constructs between these alternative replacement models. Alternative Replacement

Model 1 did *not* include 1.0 constraints between the constructs of interest. Alternative Replacement Model 2 included a 1.0 constraint between online dating and empathy. Alternative Replacement Model 3 included a 1.0 constraint between empathy and relationship quality. Lastly, Alternative Replacement model 4 included 1.0 constraints between online dating and empathy, and between empathy and relationship quality. The fit indices of these additional alternative models are presented in Table 43.

Table 43

Model Fit Indices for the Modified Alternative Model - Objectification of Others

Removed

	X^2	df	p	CMIN/ df	CFI	RMSEA	TLI
Alternative Replacement Model 1	66.127	8	.000	8.266	.983	.067	.956
Alternative Replacement Model 2	615.245	9	.000	68.361	.826	.204	.595
Alternative Replacement Model 3	85.734	9	.000	9.526	.978	.073	.949
Alternative Replacement Model 4	1077.474	10	.000	107.747	.694	.257	.358

Note. The complete measurement model was estimated with ML due to the complexity and size of the model.

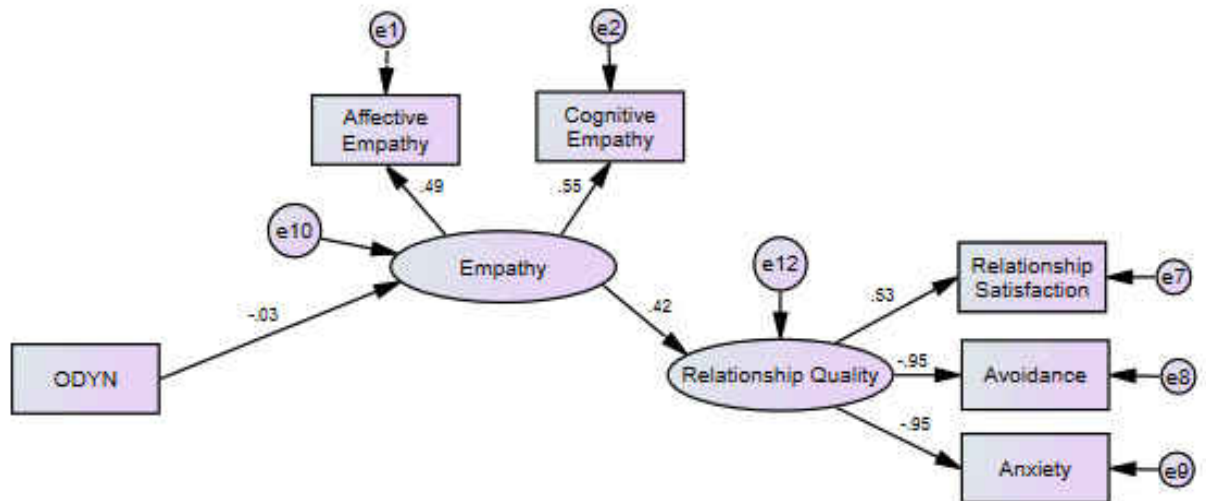


Figure 79: Alternative Replacement Model 1 - Objectification of Others Removed

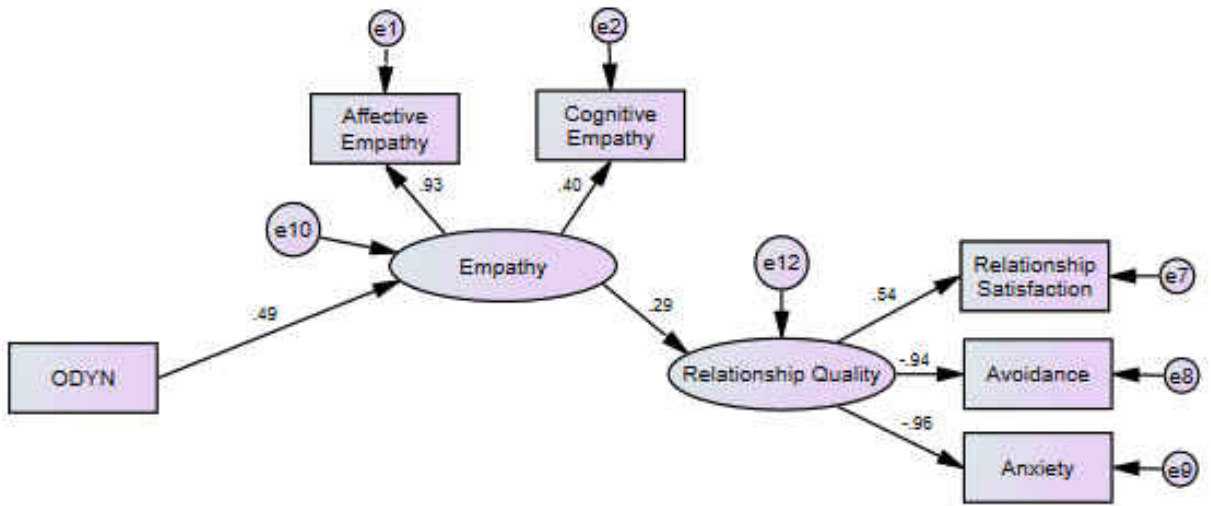


Figure 80: Alternative Replacement Model 2 - Objectification of Others Removed

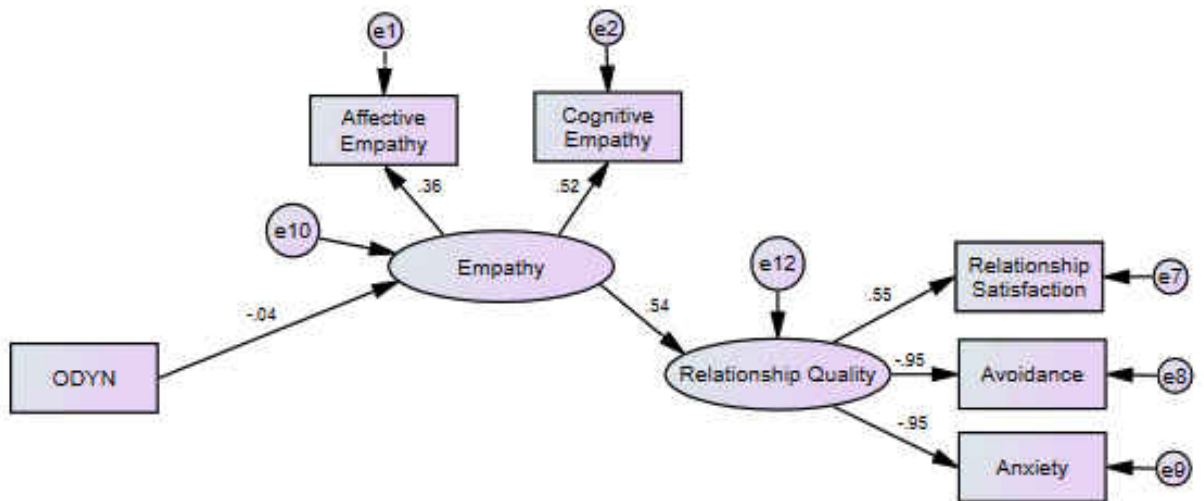


Figure 81: Alternative Replacement Model 3 - Objectification of Others Removed

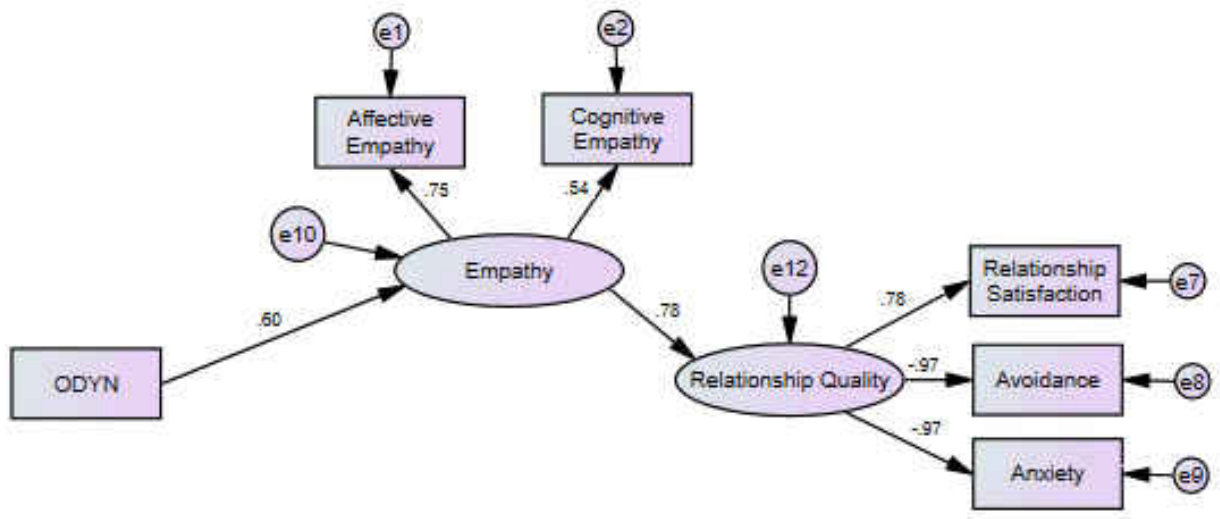


Figure 82: Alternative Replacement Model 4 - Objectification of Others Removed

The alternative replacement models did *not* present as stronger models compared to others explored in this study. However, it is worthy to note that the stronger of the alternative replacement models (e.g., Alternative Replacement Model 1, Alternative Replacement Model 3) indicated a negative relationship between online dating status and empathy; though the size of these relationships were negligible (Cohen, 1988). Based on theoretical relevance and statistical properties, the researcher determined that Alternative Replacement Models 3 and 4 were the most relevant to this investigation and future research, but both models poorly fit these data. Thus, Alternative Replacement Model 2 presented the greatest balance between regression weights, model fit indices, and parsimony.

Standard Multiple Regression. The researcher conducted multiple linear regression (MLR) to further explore the relationships between the constructs examined in this study. To conduct MLR, the researcher utilized the composite scores of the modified

data collection instruments (e.g., ODI, AMES, SOOS) as well as the composite score for Romantic Relationship Quality (e.g., RAS and reflected scores for the ECR-RS). The data used to conduct MLR had previously been transformed to reduce skewness and kurtosis, and the researcher failed to identify evidence of multicollinearity. Despite the existence of non-linear relationships as well as linear relationships between constructs, the researcher deemed the data to have met the assumptions necessary to conduct MLR. Due to the large sample size of these data, the researcher set significance at $p < .001$ (Cohen, 1994). Additionally, the researcher only conducted follow-up analyses when relationships between constructs possessed medium to large effect sizes (Cohen, 1994). MLR was conducted with all of the constructs of interest and failed to identify relationships that were both statistically significant and contained medium effect sizes.

ANOVA. The researcher conducted a one-way between groups ANOVA to explore the differences between online daters and non-online daters across the constructs of interest in this investigation. Participants were identified as current online daters ($n = 139, 8.6\%$), individuals who have used online dating in the past year ($n = 246, 15.3\%$), individuals who have used online dating more than a year ago ($n = 118, 7.3\%$), and individuals who have *never* used online dating services ($n = 1,096, 67.9\%$). Regarding the assumptions necessary to conduct ANOVA, these data were *not* normally distributed, but the researcher addressed non-normality through the performance of data transformations. Furthermore, the data was acquired through convenience sampling and *not* random sampling. However, Pallant (2013) noted, “this is often not the case in real-life research” (p. 213). The data did meet other assumptions necessary to conduct

ANOVA (e.g., level of measurement, homogeneity of variance). Again, because of the large size of the sample in this investigation, the researcher set significance at $p < .001$ (Cohen, 1994) and only conducted follow-up analyses when medium or large effect sizes were identified (Cohen, 1994).

First, the researcher examined differences between individuals' levels of empathy based on online dating status and their levels of empathy. However, the researcher failed to identify any results with practical significance. The researcher also examined differences between individuals' levels of objectification of others and identified statistical significance between groups: $F(3, 1583) = 15.797, p < .001$. Individuals' levels of objectification of others increased based on how recently they used online dating services (see Figure 83).

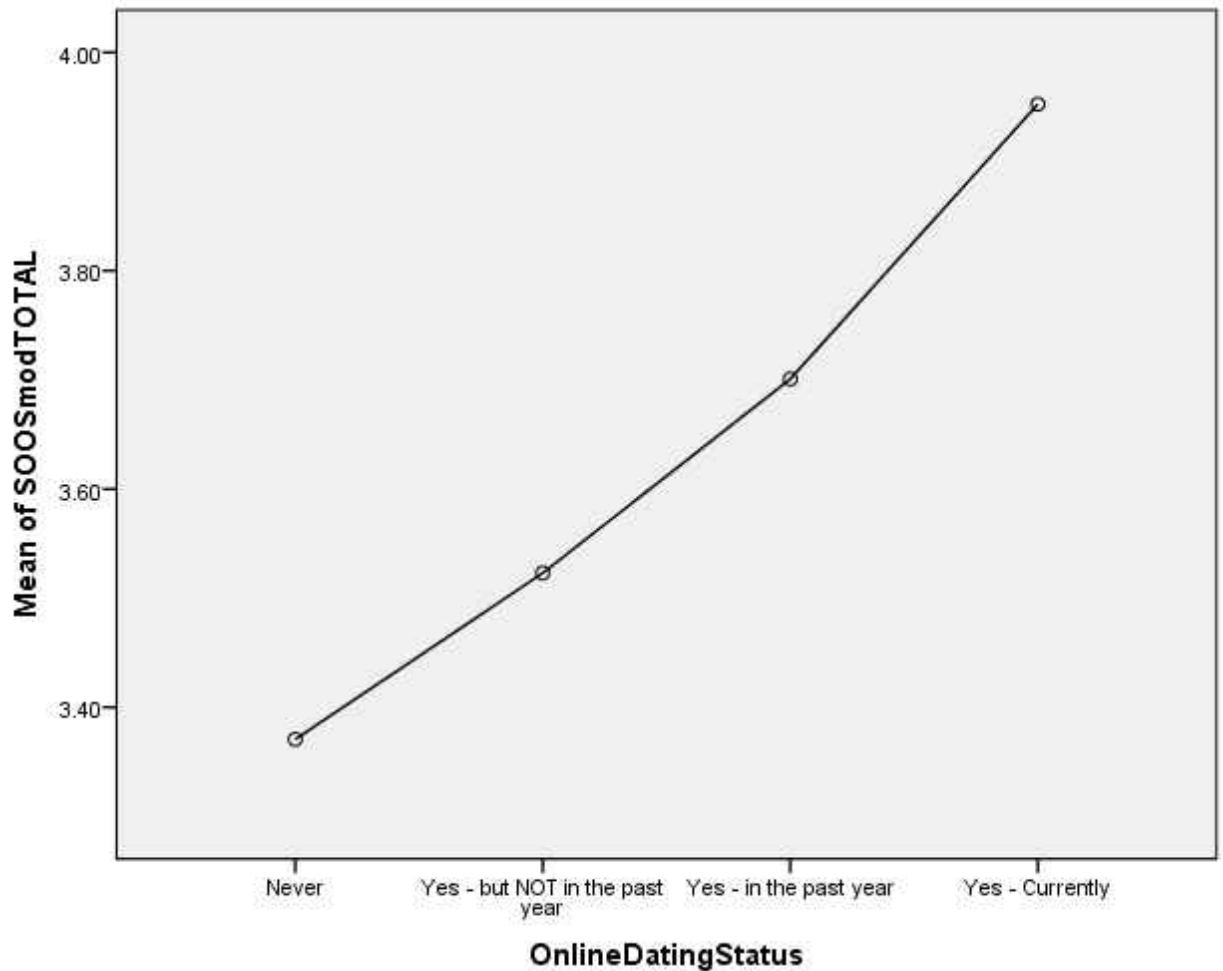


Figure 83: Levels of Objectification of Others by Online Dating Status

Lastly, the researcher examined differences between individuals' quality of romantic relationship by online dating status. The researcher identified statistical significance between groups: $F(3, 1575) = 15.980, p < .001$. Despite statistically significant differences between groups, the effect size (i.e., eta squared) was small at .03 (Cohen, 1988).

Exploratory Research Questions

Exploratory research question one. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) the online dating website or application (e.g., eHarmony, OkCupid, Tinder) emerging adults use for online dating?

The researcher intended to use ANOVA to identify differences between online daters' levels of empathy, objectification of others, and romantic relationship quality based on their membership to various online dating services. However, online daters belonged to online dating services in largely disproportionate amounts. The majority of participants reported using Tinder ($n = 416$, 82.7%), whereas the second most popular dating service used was OKCupid ($n = 76$, 15.11%). To draw comparisons between groups, the researcher examined exclusive online dating service membership – that is, membership to individual online dating services without membership to other services. However, due to the common practice of participants to belonging to two or more services ($n = 165$, 32.54%), participants who belonged to exclusively one group were minimal. For example, three participants belonged exclusively to each group of Badoo, Christian Mingle, Grindr, Match.com, while no participants belonged exclusively to Date Hook Up, Down, How About We, JDate, Love Flutter, or Zoosk. In contrast, 291 participants belonged exclusively to Tinder, whereas the next largest exclusive service

group membership was 13 for OKCupid. Twelve participants belonged to Plenty of Fish, four participants belonged exclusively to eHarmony, and one participant belonged to each Coffee Meets Bagel and Hinge. The sample sizes for the group memberships were too small and too varied in size to conduct ANOVA (Pallant, 2013; Tabachnick & Fidell, 2013).

Exploratory research question two. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) their reported demographic variables (e.g., age, gender, ethnicity, year in college, geographic location, sexual orientation)?

To identify statistically significant relationships between participants' demographic variables and their reported scores on the constructs of interest, the researcher conducted a Spearman Rank Order correlation. Spearman Rank Order correlations are preferred over Pearson's Product Moment Correlations with non-parametric, non-normally distributed data (Pallant, 2013). The Spearman Rank Correlation provides a rho (ρ) value based upon Cohen's (1988) recommended interpretations of relationships (Pallant, 2013). The relationships identified between participants' reported demographic information and their scores on the instruments used in this investigation are based on the modified measurement models and with data transformations reported earlier in this chapter. Relationships between participants'

reported demographic information and their instrument scores are reported in Table 44. Due to the large size of the sample in this investigation, the researcher set significance at $p < .001$ (Cohen, 1994) and presents follow-up analyses when medium or large effect sizes were identified (Cohen, 1994).

Table 44

Spearman Rank Order Correlations between Demographic Factors and Intensity of Online Dating, Empathy, Objectification of Others, and Quality of Romantic Relationships

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	1													
Gender	-.044	1												
Race	.017	-.041	1											
Ethnicity	-.031	.020	-.136*	1										
College	.893*	-.102*	.039	-.021	1									
Year														
Major	-.008	-.147*	.052	.041	-.013	1								
School	.228*	.031	.091*	.063	.250*	.032	1							
Sexual	-.040	.012	.011	-.024	-.052	.008	.021	1						
Orientation														
Relationship	.213*	-.122*	.083*	.008	.209*	-.045	.007	-.081*	1					
Status														
Relationship	.109*	-.231*	.024	-.013	.117*	.009	-.041	-.059	.357*	1				
Goal														
ODI	.134	-.028	.008	-.020	.082	-.107	-.047	-.062	.025	.018	1			
AMES	.012	-.245*	.069	.061	.057	.054	.027	-.015	.083*	.134*	.057	1		
SOOS	-.020	.267*	.001	-.018	-.029	-.050	.002	-.111*	-.061	-.168*	.042	-.017	1	
Relationship	-.001	-.127*	.089*	-.012	.027	-.038	-.047	-.049	.479*	.303*	-.041	.187*	-.102*	1
Quality (ECRRS and RAS)														

Note. * Correlation is significant at the .001 level (2-tailed).

Having determined the existence of relationships between participants' demographic information and the constructs of interest, the researcher opted to examine the identified relationships more closely. Participants' relationship status was related to participants' quality of romantic relationships ($\rho = .479, p < .001$). Participants' relationship status accounted for 22.94% of the variance of participants' quality of romantic relationships. The researcher identified a statistically significant model $F(7, 1593) = 79.049, p < .001$ with a large effect size ($\eta^2 = .26$; Cohen, 1988). Individuals who were single ($M = 1.65, SD = 1.19$) differed from individuals who reported being in a relationship ($M = 2.96, SD = .97; p < .001$), cohabitating ($M = 3.2, SD = .68; p < .001$), engaged ($M = 3.08, SD = .77; p < .001$), and married/partnered ($M = 2.82, SD = 1.04; p < .001$). Individuals who reported their relationship status as dating ($M = 1.65, SD = 1.19$) differed from individuals who reported being in a relationship ($p < .001$), cohabitating ($p < .001$), engaged, and married/partnered ($p < .001$). Additionally, individuals who reported their relationship status as being in a relationship differed from individuals who reported being divorced ($M = -.57, SD = 1.18; p < .001$) or "other" ($M = 1.61, SD = 1.35; p < .001$). Cohabiting individuals also differed from individuals who reported being divorced ($p < .001$) or "other" ($p < .001$). Lastly, participants who identified as being married/partnered differed from individuals who reported their status as divorced ($p = .001$) and other ($p = .022$).

Participants' relationship goal accounted for 9.2% of the variance of participants' quality of romantic relationships ($\rho = .303, p < .001$). The researcher identified a statistically significant model $F(3, 1573) = 53.028, p < .001$ with a medium effect size

($\eta = .09$; Cohen, 1988). Participants who reported pursuing a date ($M = 1.64, SD = 1.13$) differed from participants pursuing a long-term relationship ($M = 2.42, SD = 1.24; p = .039$). Similarly, participants pursuing a sexual encounter ($M = 1.36, SD = 1.21$) and short-term relationship ($M = 1.54, SD = 1.16$) both demonstrated statistically significant differences from participants pursuing a long-term relationship ($p < .001; p < .001$).

Exploratory research question three. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) with (or and) their scores of social desirability (as measured by the MCSDS-A (Reynolds, 1982)?

In order to examine the relationship between social desirability and the constructs of interest in this investigation, the research conducted bivariate correlations between the modified measurement models and the MCSDS-FA (Reynolds, 1982). The researcher presents Pearson-Moment correlation coefficients in Table 45.

Table 45

Pearson-Moment Correlations

	ODI	AMES	SOOS	ECRRS	RAS	Relationship Quality	MCSDS- FA
ODI	1						
AMES	.051	1					
SOOS	.053	-.024	1				
ECRRS	.023	-.139**	.087**	1			
RAS	.031	.095**	-.090**	-.525**	1		
Relationship Quality	.010	.174**	-.087**	-.692**	.935**	1	
MCSDS-FA	-.009	.019	-.236**	-.050*	.020	.010	1

Note. ** Correlation is significant at the .01 level (2-tailed). * Correlation is significant at the .05 level (2-tailed).

Social desirability was statistically significantly related to two constructs. Social desirability shared a small relationship with participants' attachment scores on the ECRRS ($r = -.050$; 0.3% of the variance accounted for, $p < .05$). However, more notably, participants' scores on the MCSDS-FA were statistically significant ($p < .01$) and related to participants' level of objectification of others as measured by the SOOS ($r = -.236$, 5.57% of the variance accounted for). The researcher conducted a standard linear regression to further explore the relationship between social desirability (i.e., MCSDS-FA scores) on objectification of others (i.e., SOOS scores). The model accounted for 5.6% ($r = .236$) of the variance of emerging adults' objectification of others. The model was statistically significant, $F(1, 1580) = 93.239$, $p < .001$. Social desirability presented with a statistically significant ($p < .001$) beta weight of $-.236$. A visual representation of MCSDS-FA and SOOS scores indicates that as participants' levels of social desirability increased, participants' self-reported scores of objectification decreased. Stated

differently, members who reported higher levels of objectification of others presented with lower levels of social desirability (see Figure 84).

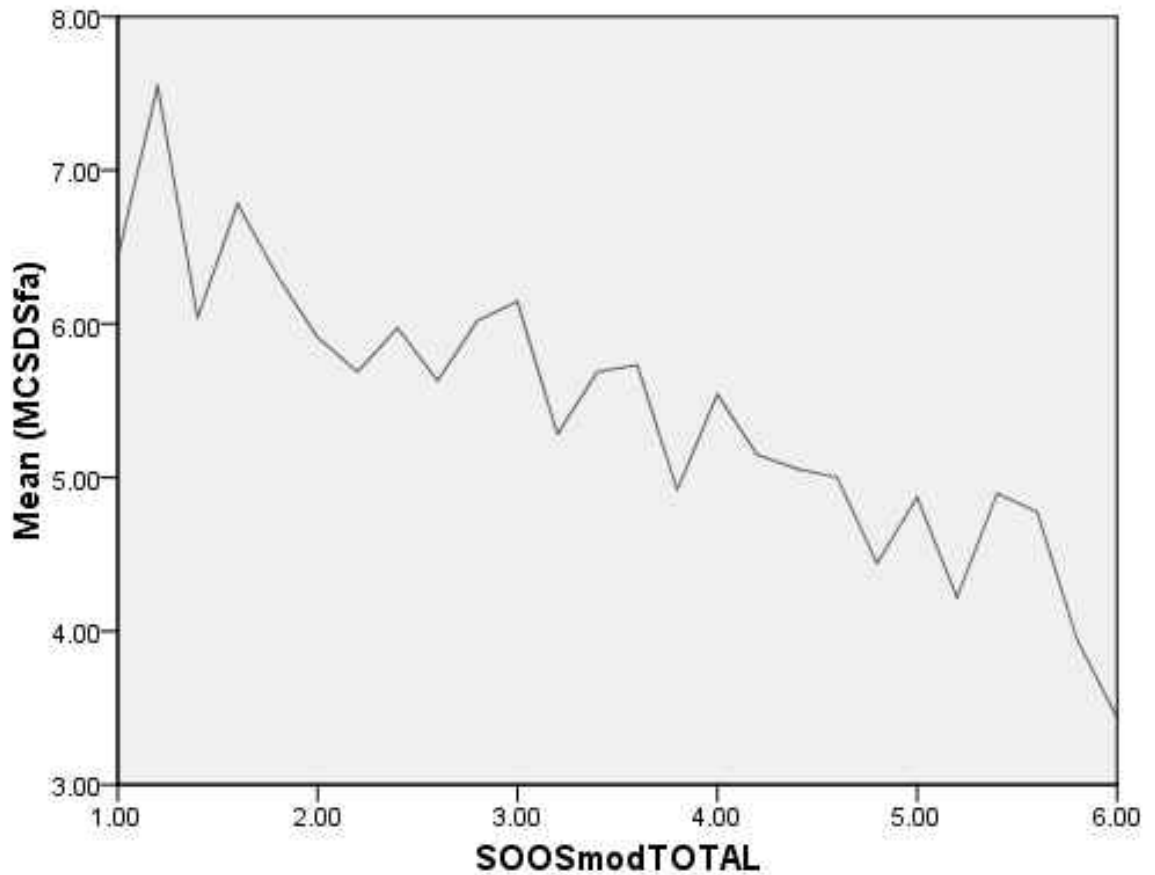


Figure 84: Levels of Objectification of Others by Social Desirability

Exploratory question four. Is there a difference between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-

RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) based on the data collection method?

The researcher collected data in this investigation through face-to-face data collection and by online survey. Regarding online survey, participants were either invited by email to complete the survey on a survey website (www.qualtrics.com), or participants chose a link through the UCF Psychology department's SONA system. The researcher conducted a series of ANOVAs with the constructs of interest to determine if there were differences between participants' scores based on data collection method. The model for online dating, empathy, and relationship quality all passed Levene's Test of Homogeneity of Variance (e.g., $p > .05$). However, the model for the objectification of others did *not* pass Levene's Test of Homogeneity of Variance ($p = .047$). Due to the large sample size, independent cases, and robustness of ANOVA, the researcher determined that these data still met criteria to conduct ANOVA (Pallant, 2013).

The model examining differences in participants' use of online dating by data collection method was *not* statistically significant $F(2, 500) = 1.725, p = .179$ and produced a small effect ($\eta = .01$; Cohen, 1988). Similarly, the model examining differences in participants' quality of romantic relationships by data collection method was *not* statistically significant $F(2, 1588) = .094, p = .910$ and produced a negligible effect ($\eta = .00$; Cohen, 1988). Participants' level of empathy differed by data collection method; $F(2, 1602) = 2.997, p = .050$ and produced a negligible effect ($\eta = .00$; Cohen, 1988). However, no group (e.g., SONA online survey, email invitation, face-to-face) differed statistically significantly from one another. Lastly, the researcher identified a

statistically significant model for differences between participants' level of objectification of others based on data collection method: $F(2, 1596) = 5.184, p = .006$ and produced a small effect ($\eta^2 = .01$; Cohen, 1988). Specifically, participants who completed the data collection instruments through the SONA system ($M = 3.58, SD = 1.07$) differed from participants who completed the data collection instruments through face-to-face data collection ($M = 3.4, SD = 1.16; p = .017$).

Chapter Four Summary

In chapter four, the researcher presented the results regarding (a) sampling and data collection procedures, (b) initial descriptive statistics and data results, (c) data screening and statistical assumptions for SEM, (d) model specification and identification, (e) secondary analyses of descriptive statistics and statistical assumptions, and (f) data analysis of the research hypothesis and exploratory questions. The researcher utilized SEM to analyze the research hypothesis (Byrne, 2010; Kline, 2011; Schumacker & Lomax, 2010), and the researcher examined the exploratory research questions using (a) descriptive statistics, (b) Pearson's correlations, (c) Spearman Rank Order correlations, (d) multiple regressions, (e) ANOVA, and (f) Independent-Samples T-Test. In chapter five, the researcher presents a discussion of the results and offers implications for counselors, counselor educators, and future research.

CHAPTER FIVE: DISCUSSION

Chapter five provides an overview of the study, the research methodology, and the significance of the results from the investigation. Specifically, the chapter presents the results of the primary research hypothesis and exploratory questions and compares those findings with previous research presented in chapter two. Furthermore, the chapter reviews limitations of this study (e.g., research design, instrumentation) as well as recommendations for future research and implications for clinical practice, counselor educators, and instrument development.

Study Summary

Individuals are using digital mediums (i.e., online dating) to form relationships with greater frequency than ever before (Smith & Duggan, 2013). Researchers have identified risks and dangers associated with online dating (Couch et al., 2012) and criticized online dating as an unviable option to form romantic relationships due to its bypassing of nonverbal communication (Riva, 2002) and promotion of other-objectification (Hitsch et al., 2006). Indeed, the evaluative nature of online dating (Sritharan et al., 2010) theoretically opposes the development of empathic connection required for healthy interpersonal relationships (Siegel, 2010; Szalavatz & Perry, 2010). While researchers have investigated counseling implications associated with online dating, empathy, objectification of others, and romantic relationships, an extensive review of the published literature (e.g., EBSCOhost) failed to identify a research study, dissertation, or thesis that examined these constructs in accordance with one another.

Therefore, this study investigated the influence of online dating on the constructs of interest established in the counseling literature (e.g., empathy, objectification of others, and the quality of romantic relationships) with a sample of emerging adult (i.e. 18-29 years old) college students (e.g., undergraduate, master's level). The research questions and findings of the current investigation align with the professional standards of the counseling field and contribute to a growing body of literature examining counseling implications associated with online dating in emerging adult populations.

After receiving approval from UCF's IRB, data was collected through online (www.qualtrics.com) and face-to-face methods. The sample for this investigation included 1,613 undergraduate and graduate college students from the University of Central Florida (UCF), Florida Gulf Coast University (FGCU), East Carolina University (ECU), University of North Carolina-Charlotte (UNCC), Rollins College, University of San Diego (USD), Stetson University, Georgia State University (GSU), and Valencia College. The researcher utilized Dillman's (2007) *Tailored Design Method*, which resulted in a total useable response rate of 84.72% ($N = 1,613$). Participants completed data collection packets that included (a) general demographic form, (b) the ODI, (c) AMES (Vossen et al., 2015), (d) SOOS, (e) ECR-RS (Fraley et al., 2011), (f) RAS (Hendrick, 1988), and (g) MCSDS-FA (Reynolds, 1982). The researcher utilized multiple quantitative procedures to analyze the data, including (a) Structural Equation Modeling (SEM), (b) descriptive statistics, (b) Pearson's correlations, (c) Spearman Rank Order correlations, (d) multiple regressions, (e) ANOVA, (f) confirmatory factor analysis (CFA), and (g) exploratory factor analysis (EFA). Statistical significance was established

at .001, and the researcher performed post-hoc analyses of statistically significant relationships and medium to large effect sizes.

Descriptive Data Analysis

Emerging adult (18-29 year olds) college students were the target population of this study. The researcher invited emerging adult undergraduate and master's level students between the ages of 18 and 29 enrolled at a college or university in the United States to participate in this study regardless of gender, race or ethnicity, or any other demographic variable. The reported demographic data for the participants was consistent with previous research utilizing emerging adult samples (e.g., Fox & Warber, 2013; Rappleyea et al., 2014; Schade et al., 2013).

In regard to online dating status, most participants reported that they have *never* used online dating services ($n = 1,096$; 67.9%), compared to 503 (31.18%) who have. Specifically, 139 participants (8.6%) reported that they currently use online dating services, whereas 246 participants (15.3%) reported that they have used online dating services in the last year, and 118 participants (7.3%) reported that they used online dating services more than one year ago. Most participants reported that they have only used one online dating service ($n = 342$; 21.2%), compared to participants who have used two services ($n = 106$; 6.6%), three services ($n = 40$; 2.5%), or four or more services ($n = 19$; 1.2%).

Instrumentation and Measurement Models

The researcher utilized several data collection instruments to measure the constructs of interest in this study. The researcher modified Ellison and colleagues' (2007) *Facebook Intensity Scale* (FBI) to create the *Online Dating Inventory* (ODI) and measure participants' intensity of online dating. The researcher utilized the *Adolescent Measure of Empathy and Sympathy* (AMES; Vossen et al., 2015) to measure participants' levels of empathy. The researcher modified an instrument created by two students at Illinois Wesleyan University (see Curran, 2004; Zolot, 2003) now called the *Sexual-Other Objectification Scale* (see Chapter 3) to measure the objectification of others. Additionally, the researcher utilized the *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) and the *Relationship Assessment Scale* (Hendrick, 1988) to measure quality of romantic relationships. In this investigation, romantic relationship quality was determined by relationship satisfaction (as measured by the RAS [Hendrick, 1988]) and attachment style (e.g., *secure, anxious, avoidant*; Pistole, 1989), where attachment style was used to draw inferences about an individual's level of commitment, trust, relationship satisfaction, and emotional experiences in their relationship (Simpson, 1990). Lastly, the researcher employed a short-form of the *Marlowe-Crowne Social Desirability Scale* (MCSDS; Crowne & Marlowe, 1960) to account for possible response-bias and to promote internal validity (Reynolds, 1982).

The researcher conducted a CFA with the data for each instrument to evaluate the psychometric properties of the instrument with these data. When CFA resulted in poor model fit, the researcher split the data in approximately half and conducted EFA to

identify a more appropriate factor structure for use with these data (Hair et al., 2010).

After conducting EFA, the researcher confirmed the newly identified factor structure with CFA using a subsample of the data that was excluded from CFA.

Online dating. The researcher defined online dating in this study as use of any Internet website or cell phone application where an individual can create a profile and contact others as potential romantic partners for the purpose of sexual activity, dating, or forming romantic relationships. The researcher modified the *Facebook Intensity Scale* (Ellison et al., 2007) to measure online dating use, which resulted in the creation of the *Online Dating Inventory* (ODI; see Chapter 3). The modifications to the FBI resulted in a 10-item instrument on a 5-point Likert scale (see Appendix J). Scores are obtained by calculating a participant's mean score per factor (e.g., *Attitudes*, *Intensity*). Cronbach's α for the entire ODI (10 items) was .815 ($n = 494$). Cronbach's α for the *Attitudes* subscale (items 1-3; $n = 504$) was .801 and Cronbach's α for the *Intensity* subscale (items 4-10; $n = 497$) was .713, which was appropriate (Hair et al., 2006). The internal consistency of this scale *cannot* be compared with any other research, as the ODI has not been used in other investigations. However, the internal consistency for the instrument and its subscales were consistent with values reported by Ellison and colleagues (2007) and Sherrell (2013). Therefore, the researcher determined that these data measured by the ODI were valid and reliable.

The measures of central tendency for the initial ODI and its scales indicated that participants had low levels of intensity of online dating use in terms of their attitudes towards online dating and their behaviors. The central tendencies were (a) Attitudes (3

items; $M = 1.88$, $SD = 0.93$, Range = 4, $Mdn = 1.67$, Mode = 1); (B) Intensity (7 items; $M = 1.61$, $SD = 0.60$, Range = 3.57, $Mdn = 1.43$, Mode = 1); and (c) Total (3 items; $M = 1.7$, $SD = 0.63$, Range = 3.70, $Mdn = 1.5$, Mode = 1). Because the ODI has *not* been used in previous studies, these data *cannot* be compared to other studies.

The initial CFA with the ODI was based on the anticipated factor structure. The initial CFA revealed low and high factor loadings ranging from .36 to .91 and a minimally acceptable model fit $\chi^2(34, N = 494) = 169.424$, $CMIN/df = 4.983$, $GFI = .931$, $CFI = .664$, $RMSEA = .090$, and $TLI = .555$. Due to a multitude of standardized covariance values and weak factor loadings associated with items 4, 9, and 10, the researcher removed the items and identified acceptable model fit $\chi^2(13, N = 494) = 32.615$, $CMIN/df = 2.509$, $GFI = .981$, $CFI = .934$, $RMSEA = .055$, $TLI = .893$. The internal consistency reliability for the first factor remained satisfactory with a Cronbach's α of .801, while Cronbach's α for the *Intensity* subscale increased to .726. Thus, the researcher determined that modifications made to the ODI to fit these data maintained the strong psychometric properties of the instrument with a population of emerging adult college students.

Further examination of these ODI data revealed non-normality. Therefore, the researcher performed a logarithmic transformation on the Intensity scale of the ODI to reduce the influence of skewness and kurtosis. A review of the central tendencies for the modified ODI indicated that the participants in this study reported a low level of intensity of their use of online dating services on the Attitudes (3 items; $M = 1.88$, $SD = 0.94$, Range = 4, $Mdn = 1.67$, Mode = 1) and Intensity (4 items; $M = .145$, $SD = 0.17$, Range =

65, $Mdn = 0.097$, Mode = 1) scales. It would appear that, despite the prevalence of online dating use amongst emerging adult college students, individuals do *not* exhibit excessive levels of use of these services. However, it is necessary to note that no identified studies have attempted to measure individuals' intensity of use of online dating services, and thus it is difficult to interpret these findings. Furthermore, despite the researcher's use of transformation to reduce skewness and kurtosis, it is necessary to interpret these results with caution due to the non-normal distribution of these data.

Empathy. The researcher utilized the *Adolescent Measure of Empathy and Sympathy* (AMES; Vossen et al., 2015), which was designed to address the limitations of other measurements of empathy. The AMES is a 12-item empathy assessment with three factors consisting four items per factor (a) *Cognitive Empathy*, (b) *Affective Empathy*, and (c) *Sympathy*. Participants respond to each item on a 5-point Likert scale ranging from (1) never, (2) almost never, (3) sometimes, (4) often, and (5) always. The initial examination of the internal consistency for the entire AMES was acceptable ($\alpha = .822$; $n = 1,598$). Cronbach's α for the *Affective Empathy* subscale (items 5, 7, 9, and 12; $n = 1,605$) was .791, Cronbach's α for the *Cognitive Empathy* subscale (items 1, 3, 8, and 10; $n = 1,611$) was .787, and Cronbach's α for the *Sympathy* subscale (items 2, 4, 6, and 11; $n = 1,607$) was .708, all of which indicated acceptable internal consistency (Hair et al., 2006) and is consistent with previous research (Vossen et al., 2015). Thus, the researcher determined that the AMES produce valid and reliable data in this investigation.

The measures of central tendency for the initial AMES identified higher than average levels of affective empathy, cognitive empathy, and sympathy when compared to

previous research with adolescents (e.g., 10-15 year olds, Vossen et al., 2015; see Table 46). The central tendencies with these data were (a) Affective Empathy (4 items; $M = 3.16$, $SD = 0.75$, Range = 4, $Mdn = 3$, Mode = 3), (B) Cognitive Empathy (4 items; $M = 3.82$, $SD = 0.59$, Range = 4, $Mdn = 3$, Mode = 3), (c) Sympathy (4 items; $M = 4.3$, $SD = 0.6$, Range = 4, $Mdn = 4.5$, Mode = 5). Higher levels of empathy with these data when compared to younger participants from other research (Vossen et al., 2015) is consistent with research that supports an increase in empathy from early adolescence into emerging adulthood (Allemand et al., 2015). These findings support normal trends in empathy development between adolescence and emerging adulthood and further indicate that participants in this study were *not* unique in regard to their levels of empathy.

Table 46

Participant Empathy Levels Reported with the AMES in Two Samples and Two Studies

Subscale	Study 1		Study 2	
	<i>M (SD)</i> Males	<i>M (SD)</i> Females	<i>M (SD)</i> Males	<i>M (SD)</i> Females
Affective Empathy	2.39 (0.65)	2.82 (0.65)	2.72 (0.69)	2.87 (0.57)
Cognitive Empathy	2.97 (0.79)	3.34 (0.73)	3.04 (0.72)	3.24 (0.64)
Sympathy	2.59 (0.68)	3.15 (0.78)	3.76 (0.67)	3.89 (0.61)

Note. Table adopted from “Development of the Adolescent Measure of Empathy and Sympathy,” by H. G. M. Vossen, J. T. Piotrowski, and P. M. Valkenburg, 2015, *Personality and Individual Differences*, 74, pp. 66-71.

The researcher conducted a CFA on the anticipated factor structure of the AMES with these data and identified an acceptable model fit $\chi^2(51, N = 1598) = 476.310$, $CMIN/df = 9.339$, $GFI = .951$, $CFI = .930$, $RMSEA = .072$, and $TLI = .910$. However, the initial model produced several ($n = 12$) covariance values greater than 2.58. Despite

modifications made to the model (e.g., item removal), the model still produced multiple ($n = 11$) covariance values greater than 2.58. Therefore, the researcher determined that an alternate measurement model of the AMES might produce stronger psychometric properties with these data. Thus, the researcher conducted EFA to identify a greater factor structure with these data.

Using a random subsample of approximately half of the data ($n = 812$), the researcher used parallel analysis (Horn, 1965) to identify appropriate level eigenvalues for factor extraction. (Patil et al., 2007). After identifying a statistically significant value for Bartlett's test of sphericity (Bartlett, 1954), and a Kaiser-Meyer-Olkin (KMO) value of .842 (Kaiser, 1970; 1974), the researcher referred to the scree plot (Costello & Osborne, 2005) and identified support for a three-factor structure accounting for 59.54% of the variance (Hair et al., 2010). However, due to low communalities and cross-loading, the researcher explored the properties of individual items and independently removed them (Comrey & Lee, 1992). The researcher ultimately identified a two-factor model with six items that accounted for 68.69% of the variance (Hair et al., 2010). The first factor included three items and accounted for 44.96% of the variance, retaining the label *Affective Empathy*. Similarly, the second factor accounted for 23.93% of the variance and consisted of 3 items, retaining the label *Cognitive Empathy* for this modified factor. Factors 1 and 2 correlated ($r = .311, p < .01$), and both factors had acceptable internal consistency reliability ($\alpha = .812; \alpha = .768$). The original AMES included a subscale on Sympathy; however, this scale was *not* supported with these data. Therefore, with these data, evidence exists that the AMES does *not* successfully account for sympathy to

distinguish it from other forms of empathy as intentionally designed by Vossen and colleagues (2015).

The researcher conducted a CFA to provide support for the modified instrument with a random subsample of the data set ($n = 796$). The researcher identified adequate internal consistency reliability for the *Affective Empathy* ($\alpha = .790$) and *Cognitive Empathy* ($\alpha = .767$) factors. The measurement model contained sufficient loadings ranging between .61 and .90 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006), and was at the threshold for acceptable model fit (see table 24). However, four standardized residual covariances exceeded the 2.58. Nonetheless, the researcher deemed this model the strongest version of the modified instrument $\chi^2(8, n = 796) = 63.035$, $CMIN/df = 7.879$, $GFI = .976$, $CFI = .963$, $RMSEA = .093$, and $TLI = .931$. These findings confirmed that an alternate measurement model with the AMES performed more strongly with these data than the hypothesized measurement model.

After confirming the factor structure of the modified instrument with these data, the researcher reexamined the measures of central tendency. Specifically, the central tendencies with these data were (a) *Affective Empathy* (3 items; $M = 3.19$, $SD = 0.784$, $Range = 4$, $Mdn = 3$, $Mode = 3$), and (b) *Cognitive Empathy* (3 items; $M = 3.84$, $SD = 0.604$, $Range = 4$, $Mdn = 4$, $Mode = 4$). These data maintained higher than average levels of empathy with the AMES compared to previous research (Vossen et al., 2015) and continued to support the unremarkable empathy characteristics of this population, lending to the generalizability of the findings from this investigation to emerging adult college student populations at large.

Objectification of others. The objectification of others is a new construct that was identified as an important phenomenon in the cycle of objectification (Fredrickson & Roberts, 1997; Strelan & Hargreaves, 2005). However, few instruments measure the construct of other-objectification. Therefore, the researcher modified an instrument created by two students at Illinois Wesleyan University (see Curran, 2004; Zolot, 2003) now called the *Sexual-Other Objectification Scale* (see Chapter 3). The SOOS is a 12-item assessment that uses a 6-point Likert scale with three anticipated factors (a) *Internalized Sexual Objectification* (items 1, 2, 5, 9, and 11), (b) *Disempathy and Commenting About Individuals' Bodies* (items 4, 6, 8, and 10), and (c) *Insulting Unattractive People* (items 3, 7, and 12). The initial internal consistency for the entire SOOS ($\alpha = .835$; $n = 1,584$) and the *Internalized Sexual Objectification* scale (items 1, 2, 5, 9, and 11; $\alpha = .805$; $n = 1,603$) were both acceptable. However, the internal consistency for the *Disempathy and Commenting About Individuals' Bodies* scale (items 4, 6, 8, and 10; $n = 1,602$) was .610, and Cronbach's α for the *Insulting Unattractive People* scale (items 3, 7, and 12; $n = 1,605$) was .607; both of which are questionable with these data (Hair et al., 2006). Thus, the researcher determined that data acquired with the SOOS might have weaker psychometric properties and questionable validity.

The researcher reviewed the measures of central tendency for the initial SOOS with these data. Specifically, the measures of central tendency were (a) *Internalized Sexual Objectification* (5 items; $M = 3.9$, $SD = 1.04$, Range = 5, $Mdn = 4$, Mode = 4.2), (b) *Disempathy and Commenting About Individuals' Bodies* (4 items; $M = 3.08$, $SD = 0.93$, Range = 5, $Mdn = 3$, Mode = 3.5), (c) *Insulting Unattractive People* (3 items; $M =$

3.97, $SD = 1.06$, Range = 5, $Mdn = 4$, Mode = 4, and (d) Total (12 items; $M = 3.64$, $SD = 0.83$, Range = 4.83, $Mdn = 3.67$, Mode = 3.5. The measures of central tendency with these data support that participants bordered between objectifying and *not* objectifying others (e.g., 3.5 = *neutral*). It is necessary to note that the mode of the first and third subscales indicate a slight tendency for our participants to objectify others. The SOOS has *not* been used in prior research investigation; thus, these values *cannot* be compared to other studies. However, these findings indicated that the sample in this investigation did not exhibit remarkably low or high levels of other-objectification; thus, the researcher determined that the participants in this investigation were *not* a unique sample. Therefore, results from this investigation might be generalizable to other populations of emerging adult college students.

The researcher conducted CFA to identify model fit with the anticipated factor structure. The researcher identified multiple standardized residual covariance values exceeding 2.58 ($n = 54$), and poor model fit $\chi^2(51, n = 1584) = 716.256$, $CMIN/df = 14.044$, $GFI = .925$, $CFI = .553$, $RMSEA = .091$, and $TLI = .421$. The researcher modified the instrument through item removal and continued to identify a poor model fit $\chi^2(24, n = 1584) = 291.367$, $CMIN/df = 12.140$, $GFI = .959$, $CFI = .778$, $RMSEA = .084$, and $TLI = .667$. Thus, the researcher determined that the hypothesized measurement model did *not* perform well with these data, and an alternate measurement model might produce a stronger fit with these data.

The researcher randomly split the data in half to conduct EFA ($n = 820$) and identified both a statistically significant value for Bartlett's test of sphericity (Bartlett,

1954) and a sufficient Kaiser-Meyer-Olkin (KMO) value of .836 (Kaiser, 1970; 1974). Following parallel analysis, the researcher generated 100 random correlation matrices and compared them with the data's eigenvalues at the 95th percentile and then referred to the scree plot to determine extractable factors (Patil et al., 2007). After reviewing factor loadings, communalities, and cross-loading, the researcher independently examined and removed items (Comrey & Lee, 1992; Costello & Osborne, 2005). Ultimately, the researcher identified support for a 6-item version of the instrument with two factors that accounted for 71.48% of the variance (Hair et al., 2010). The first factor (three items) accounted for 49.43% of the variance and revolved around themes related to sexualizing another person; therefore, the researcher named factor one *Sexual Objectification*. The second factor (three items) accounted for 22.04% of the variance and revolved around themes related to unkind thoughts and feelings towards others; thus, the researcher labeled factor two: *Disempathy*. Factors 1 and 2 correlated ($r = .413, p < .01$), and both factors had acceptable internal consistency reliability ($\alpha = .887; \alpha = .664$). It would appear that this alternate model might produce a stronger fit with these data. However, it is necessary to note that the first factor regarding the sexualization of others of others accounted for a large portion of the variance, thus compelling the researcher to question the face validity of the instrument.

To provide evidence for the modified measurement model, the researcher conducted a CFA with a random subsample of the data set ($n = 764$). The modified instrument contained sufficient loadings ranging between .60 and .94 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006) with these data and bordered acceptable model fit χ^2

(8, $n = 764$) = 56.248, CMIN/ df = 7.031, GFI = .975, CFI = .899, RMSEA = .089, and TLI = .810. However, three standardized residual covariances associated with item 10 exceeded the 2.58 criteria. Thus, the researcher removed item 10. With the removal of item 10, the modified instrument exhibited acceptable model fit $\chi^2(4, n = 764) = 21.371$, CMIN/ df = 5.343, GFI = .989, CFI = .962, RMSEA = .075, and TLI = .905. The final modified measurement model for the SOOS result in a two-factor solution that accounted for 78.65% of the variance. Despite the existence of only two items on the second factor, this model met Crocket's (2010) guidelines for model identification and the researcher deemed this the strongest version of the instrument with these data based on a balance between theory, fit matrices, strong factor loadings, and *no* standardized residual covariance values exceeding the 2.58 threshold. Therefore, despite having only two items on the second factor, the researcher determined that the alternate measurement model would produce the strongest fit with these data.

After confirming the factor structure of the modified instrument with these data, the researcher reexamined the measures of central tendency. Specifically, the central tendencies with these data were (a) Sexual Objectification (3 items; $M = 3.37$, $SD = 1.397$, Range = 5, $Mdn = 3.67$, Mode = 4), and (b) Disempathy (2 items; $M = 3.67$, $SD = 1.311$, Range = 5, $Mdn = 4$, Mode = 4). These data indicated that participants bordered between objectifying and *not* objectifying others. Because the SOOS has *not* been used in prior research, these data cannot be compared to similar or dissimilar populations. However, again, these findings indicated that the sample in this investigation was likely not unique in regard to their level of other-objectification, thus lending support to the

generalizability of the findings from this investigation to other populations of emerging adult college students.

Quality of romantic relationships. The researcher utilized the *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) and the *Relationship Assessment Scale* (RAS; Hendrick, 1988) to measure quality of romantic relationships. In this investigation, romantic relationship quality was determined by relationship satisfaction (as measured by the RAS [Hendrick, 1988]) and attachment style (e.g., *secure*, *anxious*, *avoidant*; Pistole, 1989), where attachment style was used to draw inferences about an individual's level of commitment, trust, relationship satisfaction, and emotional experiences in their relationship (Simpson, 1990). The researcher reviews the psychometric properties of each instrument as well as the measurement model of quality of romantic relationships.

Relationship Structure Questionnaire (ECR-RS). The researcher employed the ECR-RS to measure an individual's attachment style. The ECR-RS is a 9-item questionnaire with two factors (i.e., *Anxiety*, *Avoidance*). Participants complete the nine items on a 7-point Likert scale with values ranging from "strongly disagree" to "strongly agree." Initial examination of Cronbach's α for the entire ECR-RS (nine items; $n = 1,601$) was .845, which is acceptable (Hair et al., 2006). Internal consistency for the *Anxiety* subscale was also acceptable with a Cronbach's α of .858 (items 1-6; $n = 1,604$), and internal consistency for the *Avoidance* subscale was high with a Cronbach's α of .901 (items 7-9; $n = 1,609$). The internal consistency of the scales with these data are similar to

those of previous research (see Table 47). Therefore, the researcher determined that the ECR-RS performed well with these data.

A review of the measures of central tendency reveal that participants reported relatively low anxiety with higher levels of avoidance, and low overall attachment anxiety/avoidance. Specifically, the central tendencies with these data were (a) Anxiety (6 items; $M = 2.14$, $SD = 1.03$, Range = 6, $Mdn = 2$, Mode = 1), (b) Avoidance (3 items; $M = 3.45$, $SD = 1.8$, Range = 6, $Mdn = 3.33$, Mode = 1, and (c) Total (9 items; $M = 2.58$, $SD = 1.05$, Range = 5.78, $Mdn = 2.56$, Mode = 1. The measures of central tendency with these data differ from previous research. Whereas research with participants of more varied age and demographic background (e.g., race, ethnicity) identifies individuals as having greater levels of anxiety and lower levels of avoidance, other studies with participants of a similar age ($M = 22.59$, $SD = 6.27$) and demographic background (e.g., race, ethnicity) identify lower levels of anxiety and avoidance (see Table 47). Additionally, it is necessary to note that the first study conducted by Fraley and colleagues (2011) utilized a 10-item version of the assessment rather than the 9-item version utilized in the current research study and in the second study conducted by Fraley et al., (2011). Overall, it would appear that participants in the current investigation exhibited anxious attachment within the normal range of previous research. However, it is noteworthy that participants in this investigation presented with greater levels of avoidant attachment than participants in previous research with the AMES (Fraley et al., 2015). With greater levels of avoidant attachment, it would be anticipated that participants in this investigation would be less empathetic as a result of their attachment

style (Britton & Fuedeling, 2005; Trusty, NG, & Watts, 2005). However, participants in this investigation appeared to have greater levels of empathy than previous research (Vossen et al., 2015), despite the presence of avoidant attachment. However, attachment styles were *not* examined in previous research with adolescent populations.

Table 47

Participant Attachment Anxiety and Avoidance Compared with Two Samples and Two Studies

Scale	Current Investigation ^a			Study 1 ^{b1}			Study 2 ^{c2}		
	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α
Anxiety	2.14	1.03	.858	3.25	1.98	.91	1.92	1.65	.83
Avoidance	3.45	1.8	.901	2.47	1.31	.87	1.27	0.82	.81

Note. Chart adopted from “The Experiences in Close Relationships – Relationship Structures Questionnaire: A Method for Assessing Attachment Orientations Across Relationships,” by R. C. Fraley, M. E. Heffernan, A. M. Vicary, and C. C. Brumbaugh, 2011, *Psychological Assessment*, 23, pp. 615-625. ^aAnxiety ($n = 1,604$); Avoidance ($n = 1,609$). ^bThis study (Fraley et al., 2011) was conducted with participants in an exclusive relationship ($M = 31.35$ years; $SD = 11.28$). ^bThis study (Fraley et al., 2011) was conducted with participants in dating or marital relationships ($M = 22.59$ years; $SD = 6.27$). ¹ $n = 21,838$. ² $n = 388$.

The researcher conducted a CFA on the ECR-RS and identified many ($n = 28$) standardized residual covariances exceeding the 2.58 threshold and poor model fit $\chi^2 (26, n = 1601) = 523.407$, $CMIN/df = 20.131$, $GFI = .976$, $CFI = .691$, $RMSEA = .109$, and $TLI = .572$. Thus, the researcher modified the instrument through item removal based on factor loadings and allowed the errors of items 5 and 6 to covary. The resulting model still contained several ($n = 10$) covariance scores greater than 2.58, but it exemplified an acceptable model fit $\chi^2 (11, n = 1601) = 120.051$, $CMIN/df = 10.914$, $GFI = .979$, $CFI = .919$, $RMSEA = .079$, and $TLI = .854$. While the ECR-RS performed acceptably with

these data, the researcher deemed it necessary to consider alternate measurement models to increase the strength of the psychometric properties of the instrument with these data.

Due to the low TLI value, and several standardized residual covariance values exceeding the 2.58 threshold, the researcher opted to conduct EFA on the instrument. However, after meeting criteria to conduct EFA and examining the properties of individual items, the researcher failed to identify a model that varied from the modified version of the instrument. The modified model accounted for 80.91% of the variance, contained *no* item cross-loading at problematic levels (e.g., $< .5$; Costello & Osborne, 2005), and included sufficient (e.g., $> .5$) commonalities; thus, the researcher determined that this model was the best-fitting model for these data. The final internal consistency reliability for the *Avoidance* ($r = .903$) and *Anxiety* ($r = .902$) was strong. Thus, modifications to the original measurement model produced the strongest data with this sample.

Due to non-normal distribution with these data, the researcher performed several transformations on the *Anxiety* and *Avoidance* scales. Specifically, the researcher performed a Square Root transformation on the *Anxiety* scale and a Logarithmic transformation on the *Avoidance* scale. The transformed data with the modified model revealed similar – albeit transformed – measures of central tendency as the original model for the *Anxiety* (4 items; $M = .240$, $SD = .206$, Range = .85, $Mdn = .243$, Mode = 0), and *Avoidance* (3 items; $M = 1.42$, $SD = .338$, Range = 1.65, $Mdn = 1.414$, Mode = 1) scales. Therefore, despite efforts to reduce the impact of non-normal data distribution, the researcher cautions interpretation of the results.

Relationship Assessment Scale (RAS). The *Relationship Assessment Scale* (RAS) is a 7-item instrument with a 5-point Likert scale where “1” represents low levels of relationship satisfaction and “5” represents high levels of relationship satisfaction. The initial Cronbach’s α for the entire RAS (seven items; $n = 1,599$) was .889, which is acceptable (Hair et al., 2006) and similar to previous research utilizing the RAS (Graham et al., 2011; Hendrick, 1988; Hendrick et al., 1998). Although, measures of central tendency for the RAS with these data reveal that participants were less satisfied in their relationships (7 items; $M = 3.85$, $SD = .92$, Range = 4, $Mdn = 2.85$, Mode = 5) than participants in other studies with diverse samples (e.g., racial backgrounds, marital status), but slightly more satisfied than individuals from clinical backgrounds (Hendrick et al., 1998; see Table 48). These findings indicate that the sample used in this investigation might have abnormally low levels of relational satisfaction compared to other populations, but consistent with previous investigations with emerging adult college students (Meeks, 1996).

Table 48

Relationship Satisfaction with the RAS Comparisons

Sample	Sample Size	Mean	SD
Intercultural couples ^a			
Anglo	30 women	4.31	.51
Anglo	30 men	4.19	.57
Bicultural	27 women	4.05	.63
Bicultural	27 men	4.19	.66
Hispanic-oriented	27 women	4.13	.80
Hispanic-oriented	27 men	4.37	.51
Parental couples ^b			
	99 women	4.07	.90
	92 men	4.22	.85
Dating couples ^c			
	149 women	4.33	.63
	149 men	4.30	.64
Clients in therapy ^d			
	40 women	3.27	1.03
	30 men	3.66	.87
Emerging adult college students ^e	1,599 college students	3.85	.92

Note. Chart adapted from “The Relationship Assessment Scale,” by S. S. Hendrick, H. Dicke, and C. Hendrick, 1998, *Journal of Social and Personal Relationships*, 15, pp 137-142. ^aData from Contreras, Hendrick, and Hendrick, 1996. ^bData from Inman-Amos, Hendrick, and Hendrick (1994). ^cData from Meeks (1996). ^dData from Unpublished data set (1997). ^eData from current investigation.

The researcher conducted a CFA on the anticipated RAS measurement model with these data and identified poor model fit $\chi^2(14, n = 1599) = 245.371$, $CMIN/df = 17.526$, $GFI = .956$, $CFI = .747$, $RMSEA = .102$, and $TLI = .620$. The researcher modified the RAS measurement model by allowing items 6 and 7 (-.25) and items 4 and 7 (.23) to covary. With the modified measurement model, the researcher identified sufficient factor loadings ranging from .56 to .91 (Comrey & Lee, 1992; Tabachnick & Fidell, 2006), and the modified measurement model produced *no* covariance scores 2.58

and supported the strength of the model (Schumacher & Lomax, 2010). The modifications to the measurement model resulted in a strong model fit for the RAS χ^2 (12, $n = 1599$) = 57.724, CMIN/ df = 4.810, GFI = .990, CFI = .950, RMSEA = .049, and TLI = .912. Thus, the researcher determined the modified RAS to produce valid and reliable measures of relationship satisfaction with these data.

Quality of romantic relationships measurement model. To measure the latent construct of relationship quality, the researcher utilized the modified *Relationship Structure Questionnaire* (ECR-RS; Fraley et al., 2011) and *Relationship Assessment Scale* (RAS; Hendrick, 1988). The researcher conducted CFA on the measurement model and identified a strong model fit χ^2 (70, $n = 1613$) = 412.073, CMIN/ df = 5.887, CFI = .976, RMSEA = .055, and TLI = .965. The overall model had questionable initial internal consistency ($\alpha = .461$); however, lower levels of internal consistency are appropriate if a measurement model contains heterogeneous items and/or factors (Cronbach, 1951). Thus, the researcher determined that the combination of attachment and relationship satisfaction was a viable measurement model for measuring participants' quality of romantic relationships.

Social desirability. The researcher employed Reynolds' short-form A of the *Marlowe-Crowne Social Desirability Scale* (MCSDS; Crowne & Marlowe, 1960) to account for possible response-bias and to promote internal validity. The MCSDS-FA is a one-factor assessment that offers a composite score indicating a participant's level of social desirability. Participants with higher scores on the assessment are determined to be responding to items in a socially desirable way rather than a truthful way. Initial

Cronbach's α for the entire MCSDS-FA (11 items; $n = 1,595$) was .620, which indicates questionable internal consistency reliability (Hair et al., 2006). However, short forms of the MCSDS consistently support similar levels of internal consistency with diverse populations (Barger, 2002). Measures of central tendency for the MCSDS-FA revealed higher levels of social desirability with these data (11 items; $M = 5.48$, $SD = 2.38$, Range = 11, $Mdn = 6$, Mode = 6) compared to previous research (Loo & Horpe, 2000; Reynolds, 1982). Thus, the researcher determined that participants' social desirability may have influenced their reported scores on the self-report instruments. Thus, the researcher deemed it necessary to further assess the potential influence of social desirability on influencing the data recorded with the surveyed sample (see Exploratory Question 3).

Complete measurement model. The researcher examined the complete measurement model, which included all measurement models for each construct, to explore relationships between indicators and latent factors (Byrne, 2010; Schumacker & Lomax, 2010). The measurement model demonstrated strong fit with these data. Therefore, the researcher did *not* modify the model (see Table 34; see Figure 61).

Table 34

Model Fit Indices for the Complete Measurement Model

	X^2	df	p	CMIN/ df	CFI	RMSEA	TLI
Theorized Measurement Model	1252.3	428	.000	2.926	.963	.035	.954

Note. The complete measurement model was estimated with ML due to the complexity and size of the model.

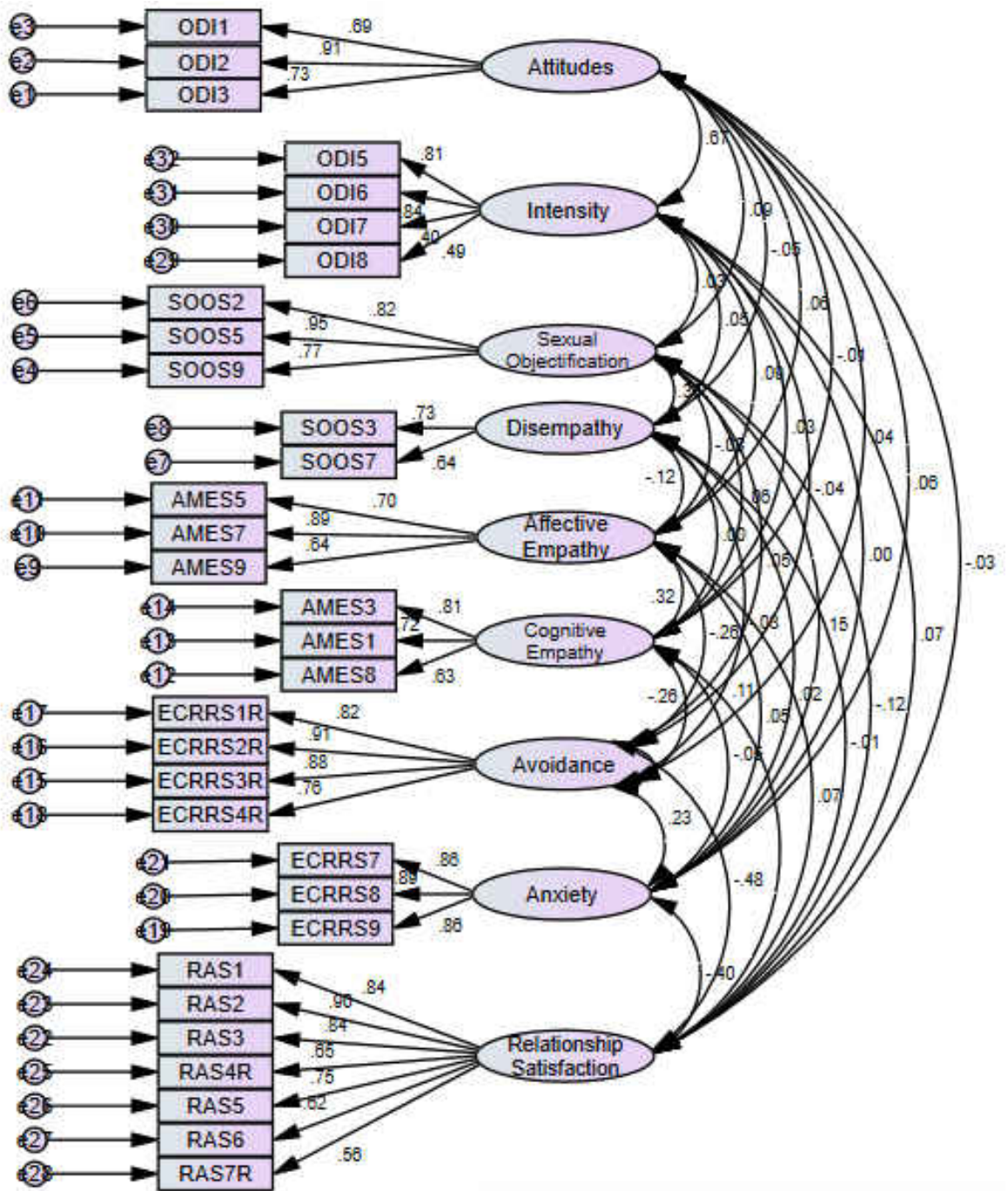


Figure 61: Complete Measurement Model

Primary Research Question Results

Primary Research Question

Do emerging adults' use of online dating websites and applications (as measured by the ODI) contribute to their levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS, and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988])?

Research Hypothesis

Emerging adults' intensity of use of online dating services (as measured by the ODI) contributes to levels of empathy (as measured by the AMES; Vossen et al., 2015), objectification of others (as measured by the SOOS), and quality of relationships with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]). Specifically, emerging adults' greater intensity of online dating service use contributes to (a) decreased levels of empathy, (b) increased levels of objectification of others, and (c) decreased quality of relationships with romantic partners (see Figure 60).

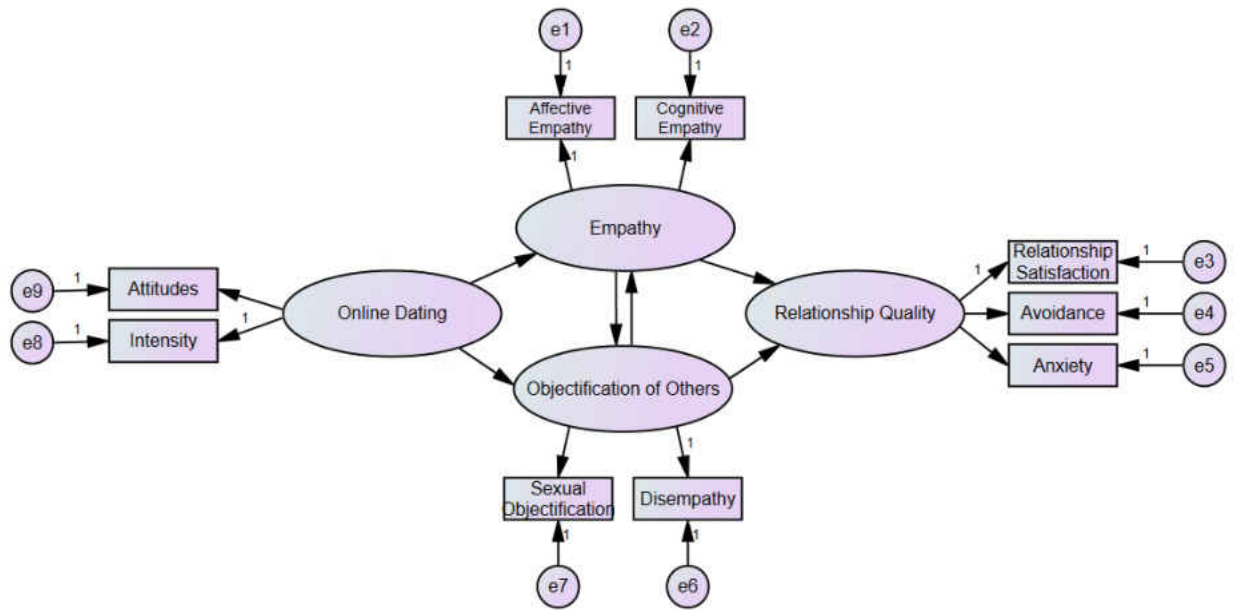


Figure 60: *Modified Path Diagram of Structural Model to be Tested*

The researcher created a structural model based on the measurement models (see Figures 54, 55, 56, 57, 58, and 59) to test the research hypothesis. The initial hypothesized model was *underidentified* and was unable to converge upon a solution. Thus, the researcher manipulated the model through the setting and freeing of parameters, which resulted in multiple structural models that met criteria for overidentification and nearly met or exceeded the minimum thresholds for good model fit (see Figures 62-63; see Table 39). The model which produced the best fit with these data included a 1.0 constraint between the latent variables of online dating on empathy, online dating on objectification of others, objectification of others on empathy, empathy on relationship quality, and objectification of others on relationship quality. Several standardized regression weights ($n = 4$) failed to meet the .4 threshold (Stevens, 1996). However, the data supported this model with a chi-square of 278.933 ($df = 26, p < .001$), CMIN/ $df =$

10.728, CFI = .934, RMSEA = .078, and TLI = .886. The tested model indicated that online dating accounted for 5.3% (standardized coefficient = .23) of variance in empathy and 9% (standardized coefficient = .30) of the variance in the objectification of others. Empathy accounted for 98% (standardized coefficient = -.99) of the variance in the objectification of others, whereas the objectification of others accounted for 59% (standardized coefficient = .77) of the variance in empathy. Empathy accounted for 64% (standardized coefficient = .80) of the variance in quality of romantic relationships, and objectification of others accounted for 37% (standardized coefficient .61) of the variance in quality of romantic relationships. The relationship between online dating and empathy was positive (.23), which might suggest that individuals who use online dating are more empathic than non-online daters. As far as the researcher is aware, the relationship between online dating and empathy has *not* been explored in previous research. Thus, this relationship cannot be compared to previous research despite being incongruent with interpersonal neurobiology theory (Siegel, 2012). Online dating was also positively related to the objectification of others (.30), which might indicate that individuals who use online dating are also more likely to objectify others. Similarly, the relationship between online dating and the objectification of others has *not* been explored in previous research. Thus, this relationship also cannot be compared to previous findings. Empathy was negatively related to the objectification of others (-.99), indicating that individuals with higher levels of empathy had lower levels of other-objectification; although, it is necessary to note that objectification of others was positively related to empathy (.77). The relationship between empathy and objectification of others might indicate that

individuals with higher levels of other-objectification also have higher levels of empathy. Empathy was positively related to individuals' quality of romantic relationship (.80), supporting previous research that identifies empathy as essential for romantic relationships (Cramer & Jowett, 2010; Levenson & Gottman, 1985; Szalavitz & Perry, 2008; Thomsen & Gilbert, 1998). Objectification of others was also positively related to individuals' quality of romantic relationship (.61), which contrasts previous research (Zurbriggen et al., 2011). However, it is necessary to note that these results need to be interpreted with caution due to the presence of non-normal data and low factor loading (e.g., $< .20$; Kline, 2011) of *Sexual Objectification* factor on the latent variable of objectification of others. Based on these findings, the hypothesis that emerging adults' greater intensity of online dating service use would contribute to decreased levels of empathy, increased levels of objectification of others, and decreased quality of relationships with romantic partners was rejected. In contrast, the findings from this investigation appear to indicate that emerging adults' greater intensity of online dating service use contributes to increased levels of empathy (5.3% of the variance explained) and increased levels of objectification of others (9% of the variance explained). Further, emerging adults' levels of empathy and objectification of others contributed to emerging adults' quality of romantic relationships (64% of the variance explained; 37% of the variance explained respectively).

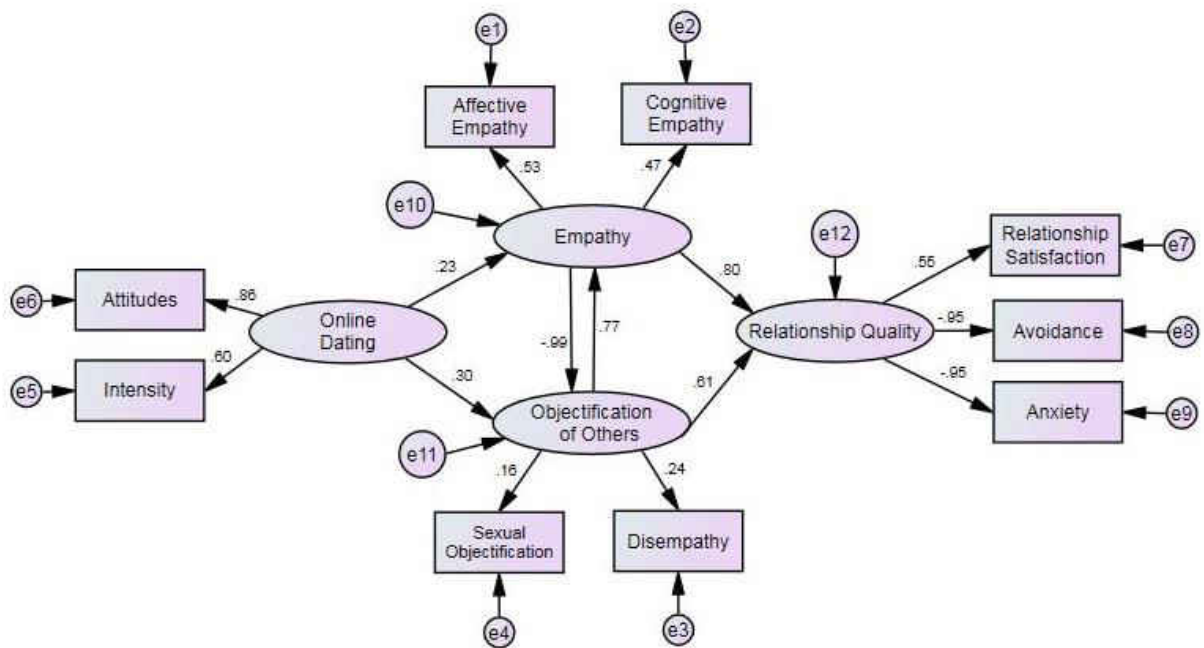


Figure 63: Respecified Structural Model (Hypothesized Structural Model 2)

Follow-Up Analysis

The researcher conducted additional analyses to investigate alternative models and model fit. Kline (2011) recommended identifying a final retained model that (a) possesses theoretical rationale, (b) distinguishes between what is known and unknown, and (c) allows researchers to pose new questions for further investigation. Therefore, the researcher examined several alternative models with these data that (a) varied the directional relationships between constructs, (b) setting or freed 1.0 constraints between constructs, (c) removed constructs (e.g., objectification of others), and (d) altered measures of online dating membership.

Regarding the strongest model with these data, the researcher reviewed the psychometric properties of the instruments used in the investigation and considered the SOOS to be a poorly performing instrument. The SOOS exhibited poor internal consistency reliability and contained only two items on the *Disempathy* factor (Hair et al., 2010), which is not best practice (Kline, 2011). Thus, the structural model that best met Kline's (2011) criteria for a final retained model was based on previously established measurement models (see Figures 54, 55, 57, 58, and 59) and was modified to remove the SOOS from the model (see Figure 78). The final model included a 1.0 constraint between online dating on empathy and performed well with a chi-square of 74.912 ($df = 13, p < .001$), CMIN/ $df = 5.762$, CFI = .983, RMSEA = .054, and TLI = .964. The final model indicated that online dating accounted for 6.8% (standardized coefficient = .26) of the variance for empathy. Empathy accounted for 16.8% (standardized coefficient = .41) of the variance for relationship quality. The relationship between online dating and empathy was positive (.26), which might suggest that individuals who use online dating are more empathic than non-online daters. Empathy was positively related to individuals' quality of romantic relationships (.41), supporting previous research that identifies empathy as an important component for successful romantic relationships (Cramer & Jowett, 2010; Levenson & Gottman, 1985; Szalavitz & Perry, 2008; Thomsen & Gilbert, 1998). Based on these findings, the researcher concluded that emerging adults' greater intensity of online dating service use contributed to increased levels of empathy and increased quality of relationships with romantic partners. In relation to interpersonal neurobiology, it is possible that the act of online dating is a form of practice for individuals to emotionally

connect to others, thus increasing one's level of empathy. However, it is also possible that online daters are generally more interested in pursuing romantic relationships than non-online daters. Being relationship oriented, it is possible that online daters possess higher levels of empathy than non-online daters. Overall, it would appear that online dating does *not* negatively influence the quality of romantic relationships through the mediating variable of empathy.

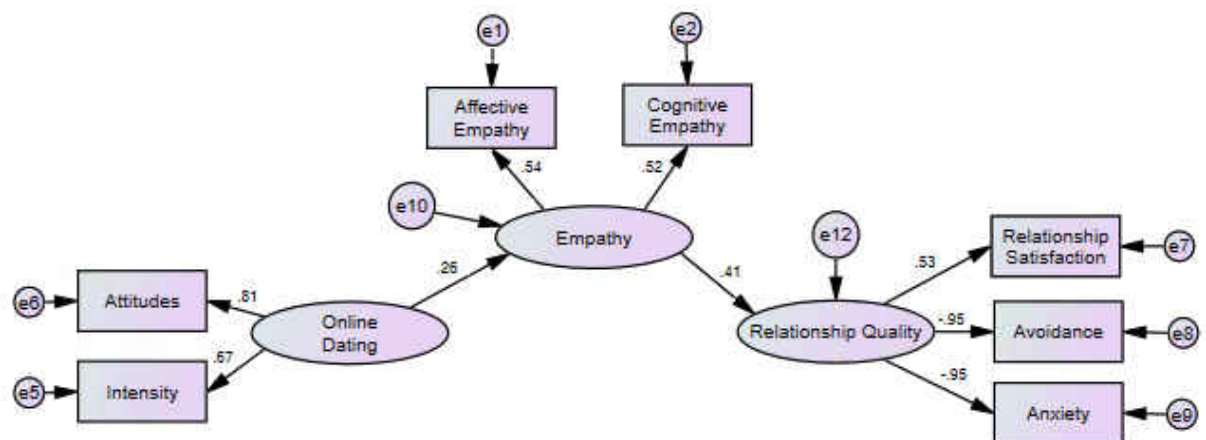


Figure 78: *Replacement Model 2 – Objectification of Others Removed*

Standard multiple regression. The researcher conducted multiple linear regression (MLR) to further explore the relationships between the constructs examined in this study. Due to the large sample size of these data, the researcher set significance at $p < .001$. Additionally, the researcher only reported on relationships with medium to large effect sizes. MLR was conducted with all of the constructs of interest and failed to identify relationships that were both statistically significant and contained medium to large effect sizes.

Analysis of variance. The researcher conducted a one-way between groups ANOVA to explore the differences between online daters and non-online daters across the constructs of interest in this investigation. Participants identified themselves as current online daters ($n = 139$, 8.6%), individuals who have used online dating in the past year ($n = 246$, 15.3%), individuals who have used online dating more than a year ago ($n = 118$, 7.3%), and individuals who have *never* used online dating services ($n = 1,096$, 67.9%). To promote findings with practical significance, the researcher set significance at $p < .001$ and only conducted follow-up analyses when medium or large effect sizes were identified.

First, the researcher examined differences between individuals' levels of empathy based on online dating status and their levels of empathy. The researcher examined differences between individuals' levels of objectification of others and identified statistical significance between groups: $F(3, 1583) = 15.797, p < .001$. Individuals' levels of objectification of others increased based on how recently they used online dating services (see Figure 83). This finding is consistent with interpersonal neurobiology theory in that practiced behaviors (e.g., more recently using online dating) influence thoughts, feelings, and beliefs (Siegel, 2010; 2013). Furthermore, this finding lends support to Szymanski and Carr's (2011) call for researchers to explore the objectification of others in diverse environments and social contexts. Specifically, Szymanski and Carr (2011) argued that therapists have a duty to address social issues influencing organizations and society; thus, research on objectification of others would do well to extend to digital and online realms in addition to physical contexts. The findings from

this investigation indicated that, indeed, the objectification of others extends into diverse (i.e. online, digital) mediums and is worthy of further investigation.

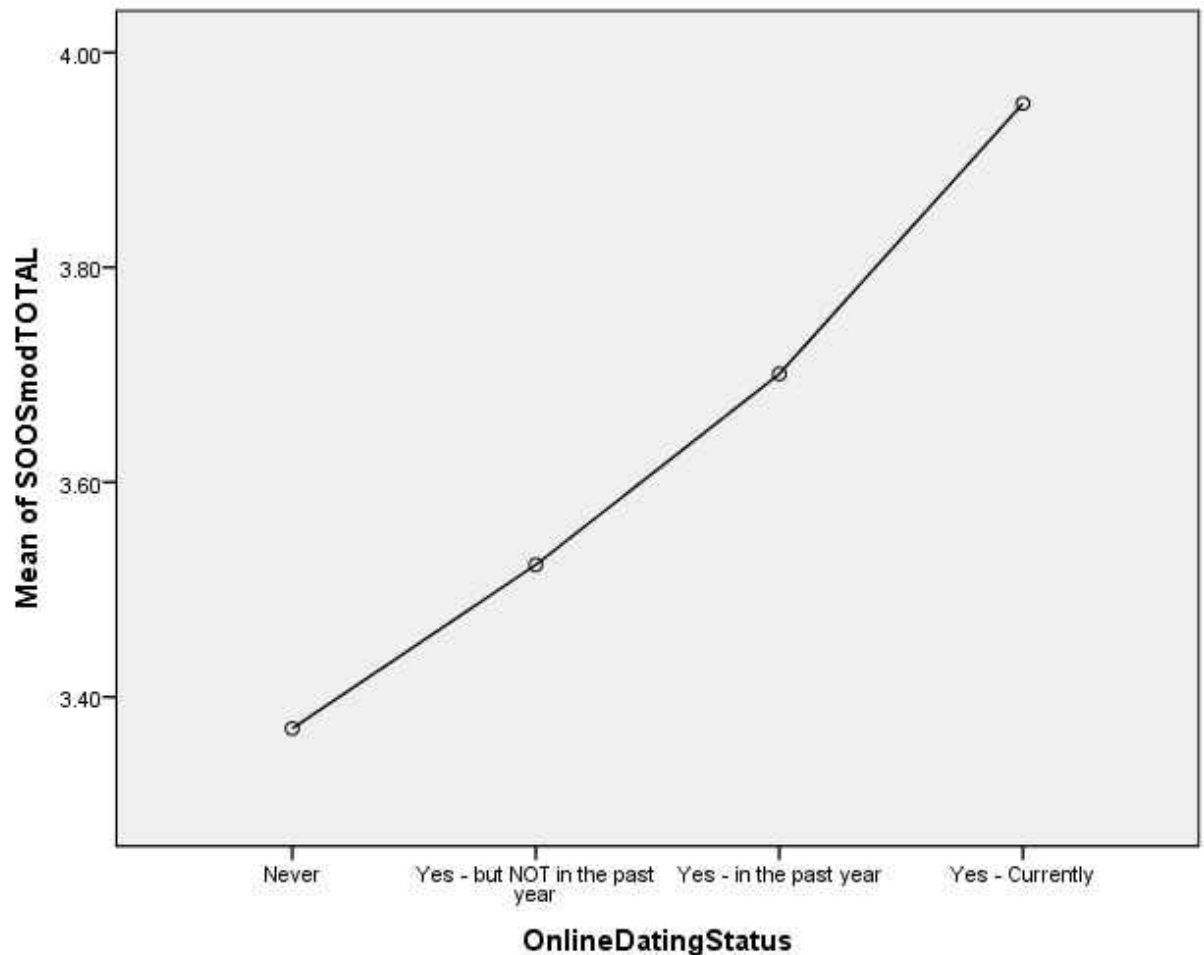


Figure 83: Levels of Objectification of Others by Online Dating Status

Discussion of the Results for the Primary Hypothesis

Overall, the results of the data analyses supported the existence of relationships between the constructs of interest (e.g., online dating, empathy, objectification of others, and quality of romantic relationships). Analysis of the hypothesized model supported that

the intensity of emerging adults' use of online dating indeed influences their levels of empathy and objectification of others, which both account for notable variance in individuals' quality of romantic relationships. However, the results did *not* support that emerging adults' *greater* intensity of online dating service use would contribute to *decreased* levels of empathy, *increased* levels of objectification of others, and *decreased* quality of relationships with romantic partners. Rather, the model revealed that emerging adults' *greater* intensity of online dating service use contributed to *increased* levels of empathy, *increased* levels of objectification of others, and *increased* quality of relationships with romantic partners. Without considering instrumentation limitations, it is possible that participants in this investigation who used online dating were more oriented towards pursuing romantic relationships and thus possessed greater levels of empathy, which would account for greater quality of relationships with romantic partners. Similarly, if the SOOS correctly measured the objectification of others, then the positive relationship of objectification of others and romantic relationship quality might be explained by the evolutionary practice of individuals evaluating potential sexual partners (i.e. objectifying) to identify the strongest and healthiest sexual partner in order to produce viable offspring (Buss, 1994). Stated alternatively, if the objectification of others is part of an evolutionary process of individuals' identifying potential romantic partners, it would follow that objectification of others would positively contribute to romantic relationship quality.

Noting the contradictory relationship identified between empathy and objectification of others, the researcher speculates that the construct of objectification of

others was poorly measured. Indeed, the factors of *Sexual Objectification* and *Disempathy* accounted for 8.32% of the variance (standardized coefficient .16 and .24, respectively) on the SOOS, indicating that the instrument might have failed to properly measure the construct. The researcher reviewed the content of the items of the instrument and believes that the instrument might have more accurately measured participants' sexual interest in others. Viewing the instrument in this light, the negative relationship between empathy and sexual interest might indicate that participants with high levels of empathy view others in a sexual way to a lesser degree than individuals with low empathy. Similarly, individuals with greater levels of sexual interest in others might be more interested in other individuals in general, and thus also possess greater levels of empathy than individuals who are less sexually interested in others. In the same vein, if the SOOS more accurately measured sexual interest than objectification of others, it would also be congruent with theory and research for individuals' SOOS scores to positively relate to quality of romantic relationships, as sexual interest is an important component of relationship satisfaction (Buss, 1994; Mark & Herbenick, 2014).

The objectification of others has historically been a difficult construct to measure (see Davidson et al., 2015; Linder et al., 2012; Zurbriggen et al., 2011) and it would appear that Zolot (2003) and Curran's (2004) modified instrument also failed to properly measure the objectification of others. Thus, the researcher tested a respecified structural model that excluded the objectification of others. The respecified model performed well with these data and indicated that emerging adults' *greater* intensity of online dating service use contributed to *increased* levels of empathy, and *increased* levels of empathy

contributed to *increased* quality of relationships with romantic partners. The identified relationship between empathy and relationship quality is consistent with previous research that supports the essential connection between an individual's level of empathy and his or her romantic relationship success and/or satisfaction (Coutinho et al., 2014; Cramer & Jowett, 2010; Levenson & Gottman, 1985; Thomsen & Gilbert, 1998). It is noteworthy that individuals' levels of online dating shared a positive relationship with participants' empathy, as this contests previous research that supports online dating as an objectifying and evaluative process (Hitsch et al., 2006; Heino et al., 2010; Rosen et al., 2008). The researcher proposes that individuals who demonstrate greater use of online dating might be a subgroup of individuals who are more interested in pursuing a romantic relationship than individuals who casually use online dating services. Thus, individuals who use online dating services to a larger degree than others might already be relationship-oriented individuals who possess greater levels of empathy than individuals passively pursuing a relationship through online dating.

Overall, the two models supported that online dating contributes to empathy, and that empathy is an important factor in regard to individuals' romantic relationship quality. Despite the questionable properties of the SOOS, it would appear that online dating also contributes to the objectification of others, and the objectification of others contributes to romantic relationship quality. However, more likely, online dating contributes to sexual interest in others, and sexual interest in others contributes to romantic relationship quality. Continuing with the critique of the SOOS that it more accurately measured individuals' level of sexual interest in others, it would appear that individuals' levels of

empathy are inversely related to their sexual interest in others. Specifically, individuals with greater levels of empathy have lower levels of sexual interest in others. In contrast, individuals with greater levels sexual interest in others might be more relationally oriented than individuals with lower levels of sexual interest in others, and thus possess higher levels of empathy. The apparent contradictory relationship between empathy and sexual interest in others might be explained by the evolutionary characteristic for individuals to evaluate (i.e. objectify) potential partners in order to discern the greatest partner with whom to produce children (Buss, 1994).

Exploratory Research Questions

Exploratory research question one. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) the online dating website or application (e.g., eHarmony, OkCupid, Tinder) emerging adults use for online dating?

The researcher intended to use ANOVA to identify differences between online daters' levels of empathy, objectification of others, and romantic relationship quality based on their membership to various online dating services. However, online daters belonged to online dating services in largely disproportionate amounts. The majority of participants reported using Tinder ($n = 416, 82.7\%$), whereas the second most popular

dating service used was OKCupid ($n = 76$, 15.11%). To draw comparisons between groups, the researcher examined exclusive online dating service membership – that is, membership to individual online dating services without membership to other services. However, due to the common practice of participants to belonging to two or more services ($n = 165$, 32.54%), participants who belonged to exclusively one group were minimal. Overall, the sample sizes for the group memberships were too small and too varied in size to conduct ANOVA (Pallant, 2013; Tabachnick & Fidell, 2013). Based on these data, it would appear that Tinder is the most popular application amongst emerging adult college students, and other online dating services might be more popular with different populations.

Exploratory research question two. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS) and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and RAS [Hendrick, 1988]) with (or and) their reported demographic variables (e.g., age, gender, ethnicity, year in college, geographic location, sexual orientation)?

To identify statistically significant relationships between participants' demographic variables and their reported scores on the constructs of interest, the researcher conducted a Spearman Rank Order correlation. Spearman Rank Order correlations are preferred over Pearson's Product Moment Correlations with non-parametric, non-normally distributed data (Pallant, 2013). Due to the large size of the

sample in this investigation, the researcher set significance at $p < .001$ and conducted follow-up analyses when medium or large effect sizes were identified.

Participants' relationship status was related to participants' quality of romantic relationships ($\rho = .479, p < .001$). Participants' relationship status accounted for 22.94% of the variance of participants' quality of romantic relationships. The researcher identified a statistically significant model $F(7, 1593) = 79.049, p < .001$ with a large effect size ($\eta^2 = .26$; Cohen, 1988). Reviewing participants' relationship satisfaction by group membership (e.g., single, dating, in a relationship), it would appear that individuals cohabiting had the greatest level of romantic relationship quality, followed by individuals who reported being engaged, in a relationship, and married/partnered. These findings differ from conclusions established by other research investigations that report cohabiting couples as having lower levels of satisfaction than married couples (Brown, 2004) and a greater likelihood of dissolution (Lichter & Qian, 2008), though intention to marry and previous marital status influences relationship satisfaction amongst cohabiters (Shafer, Jensen, & Larson, 2014). Individuals who reported being single reported the same level of romantic relationship quality as individuals who were dating. Individuals who reported "other" relationship status followed, and divorced/separated individuals reported the lowest quality of romantic relationship amongst groups. This finding is makes sense, as individuals in long-term and committed relationships would likely be more satisfied and thus more likely to continue a relationship (e.g., long term relationship, cohabitating, married) than individuals who reported being divorced, single, or dating. Thus, with a sample of emerging adult college students, it is necessary to note

that the majority of this population reported being single, dating, or in a romantic relationship, which is consistent with the developmental milestones of this population (Arnett, 2000; 2015; Chickering & Reisser, 1993; Fincham & Cui, 2000). Thus, participants in this investigation paralleled relationship patterns of emerging adult college students at large, lending support to the generalizability of findings from this investigation. Though, it is necessary to note that uneven membership by relationship status with this sample might have influenced measures of romantic relationship quality in this investigation.

Participants' relationship goals accounted for 9.2% of the variance of participants' quality of romantic relationships ($\rho = .303, p < .001$). The researcher identified a statistically significant model $F(3, 1573) = 53.028, p < .001$ with a medium effect size ($\eta^2 = .09$; Cohen, 1988). Participants who reported pursuing a long-term relationship reported the greatest level of relationship satisfaction, followed by participants pursuing a date, participants pursuing a short-term relationship, and participants pursuing a sexual encounter. The identified associations between relationship goals and romantic relationship quality appear sensible, as individuals in long-term relationships ought to experience higher levels of romantic relationship quality than other groups (e.g., dating, short-term relationship, sexual encounter), less individuals in long-term relationships end their romantic relationship. Similarly, if individuals who reported that they were interested in dating, in a short-term relationship, or pursuing a sexual encounter, they likely had lower levels of romantic relationship quality, as having higher levels of romantic relationship quality would likely motivate these individuals to then pursue a

goal of a long-term relationship. Again, with a sample of emerging adult college students, it is necessary to note that the majority of this population reported pursuing a long-term relationship, thus measures of romantic relationship quality may have been skewed by the population's relationship goals. Again, the relationship goals of these data are consistent with the developmental milestones of emerging adult populations (Arnett, 2000; 2015; Chickering & Reisser, 1993; Fincham & Cui, 2000), thus providing support for the generalizability of findings from this investigation.

Exploratory research question three. What is the relationship between emerging adults' (a) use of online dating services (as measured by the ODI), (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS), and (d) quality of relationship with romantic partners (as measured by the ECR-RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) with (or and) their scores of social desirability (as measured by the MCSDS-A; Reynolds, 1982)?

In order to examine the relationship between social desirability and the constructs of interest in this investigation, the research conducted bivariate correlations between the modified measurement models and the MCSDS-FA (Reynolds, 1982). Participants' scores on the MCSDS-FA were statistically significant ($p < .01$) and related to participants' level of objectification of others as measured by the SOOS ($r = -.236$, 5.57% of the variance accounted for). The researcher conducted a standard linear regression to further explore the relationship between social desirability (i.e., MCSDS-FA scores) on objectification of others (i.e., SOOS scores). The model accounted for 5.6% ($r = .236$) of

the variance of emerging adults' objectification of others. The model was statistically significant, $F(1, 1580) = 93.239, p < .001$. Social desirability presented with a statistically significant ($p < .001$) beta weight of $-.236$. Further analysis of participants' MCSDS-FA and SOOS scores indicated that as participants' levels of social desirability increased, participants' self-reported scores of objectification decreased. Alternatively, participants who reported higher levels of objectification of others presented with lower levels of social desirability (see Figure 84).

Based on these findings, it would appear that some participants felt – to some degree – compelled to answer items on the SOOS falsely. It is possible that false responses resulted from a desire to respond in a more favorable way (e.g., lower levels of objectification of others). Thus, social desirability in participant responses was yet another challenge to producing a strong measure of participants' objectification of others. Though, it is necessary to note that the effect of participants' social desirability on their SOOS scores was small (Cohen, 1988). Furthermore, in studies with large sample sizes, there is a greater likelihood of finding statistical significance with low practical significance (e.g., small effect size), and so this finding ought to be interpreted with caution (Cohen, 1994). Thus, overall, the researcher determined responses to be viable and trustworthy.

Exploratory question four. Is there a difference between emerging adults' (a) use of online dating services (as measured by the ODI, (b) level of empathy (as measured by the AMES; Vossen et al., 2015), (c) level of objectification of others (as measured by the SOOS and (d) quality of relationship with romantic partners (as measured by the ECR-

RS [Fraley et al., 2011] and the RAS [Hendrick, 1988]) based on the data collection method?

The researcher conducted a series of ANOVAs with the constructs of interest to determine if there were differences between participants' scores based on data collection method. Researchers have identified that data collection method might influence response rate (Dillman et al., 2009; Wolfe, Converse, Airen, & Bodenhorn, 2009) or the characteristics of responders (e.g., web-survey responders are more likely male; Wolfe et al., 2009). However, unlike other research (Mullen, 2014), the researcher failed to identify statistically significant differences with medium to large effect sizes between participants' scores based on data collection method. Thus, the researcher determined that data collection method was *not* a factor in shaping participants' responses.

In summary, the hypothesized model was rejected in favor of a model that identified that emerging adults' greater intensity of online dating service use contributed to increased levels of empathy, increased levels of objectification of others, and increased quality of relationships with romantic partners. Due to the questionable psychometric properties of the SOOS with these data, the researcher tested a respecified model without the latent construct of objectification of others and identified a model that performed well with these data. The respecified model indicated that emerging adults' greater intensity of online dating service use contributed to increased levels of empathy, and increased levels of empathy contributed to increased quality of relationships with romantic partners.

Also noteworthy, group membership of the various online dating services were too small and varied to identify differences in participants' scores for the constructs of

interest in this investigation based on online dating service membership. However, participants' relationship status was related to participants' quality of romantic relationships, and participants' relationship goals were related to participants' quality of romantic relationships. Furthermore, participants' SOOS scores may have been influenced by social desirability, further complicating the incorporation of other-objectification in the structural model. Lastly, data collection method was *not* a factor in shaping participants' responses. While researchers have investigated counseling implications associated with online dating, empathy, objectification of others, and romantic relationships, an extensive review of the published literature (e.g., using EBSCOhost) failed to identify a research study, dissertation, or thesis that examined these constructs simultaneously. Thus, the findings of this investigation contribute to a growing body of literature regarding online dating, empathy, objectification of others, and emerging adults' quality of romantic relationships.

Study Limitations

This study included several limitations. Specifically, the results of this study were limited by (a) research design, (b) sampling methodology, and (c) instrumentation (Gall et al., 2007). Thus, the results of this study should be interpreted with caution.

Research Design Limitations

The researcher attempted to anticipate and mitigate against threats to external, internal, and test validity. However, this study included several limitations associated

with extraneous and confounding variables. While this study examined the relationship between variables, it did *not* control for extraneous variables that might have influenced the tested relationships. Therefore, the results of this investigation might *not* exclusively identify the strength and directionality of relationships between constructs. To mitigate against this threat to validity, the researcher attempted to examine demographic characteristics that might have influenced the constructs of interest in this investigation.

An additional limitation to the research design is inherent in the utilization of self-report instruments (Gall et al., 2007). Specifically, participants might have responded in a socially desirable (i.e., non-authentic) way. The researcher attempted to account for social desirability through the utilization of Reynolds' (1982) MCSDS-FA. The researcher identified that social desirability might have had a small influence on participants' responses on the SOOS, but that social desirability was *not* a factor in participants' responses on the other instruments. Thus, overall, the researcher determined participants' responses to the instruments to be trustworthy.

Sampling Limitations

When considering sampling procedures, the goal is to achieve a wide and diverse sample in order to make generalizations to the population at large (Tabachnick & Fidell, 2013). While SEM performs best with random sampling, when the entire population is *not* available for sampling, convenience sampling is pragmatic and satisfactory (Gall et al., 2007). The participants in this investigation were exclusively recruited through universities in the United States, and the majority of participants were recruited from

schools in Florida. Therefore, the results of this investigation might *not* be generalizable to emerging adult college students throughout the United States or other countries.

Furthermore, the majority of participants were female and white; and thus, caution needs to be taken when interpreting the results and generalizing to more diverse emerging adult college student populations.

While efforts were taken to attain a diverse sample (e.g., multiple data collection methods, geographic diversity), only 32.1% ($n = 503$) of participants reported a history of using online dating services. Thus, the sample may have been skewed by non-online daters' characteristics (Frankel et al., 2012). Additionally, the vast majority of participants used Tinder more than any other online dating service (82.7%. $n = 416$); thus, this sample may have been influenced by online dating site membership and the results might *not* be generalizable to online daters at large.

It is also necessary to note the potential influence of environmental conditions across settings (Johnson & Christensen, 2004). Data collection was completed in the fall semester of 2015, and it is unknown how participants might have responded if data collection took place during a different time of year (e.g., winter break, spring semester, summer vacation). Also, data collection method might have influenced participants' responses, as participants recruited through SONA received course credit and had the opportunity to participate in alternate research studies. Thus, participants recruited through SONA might have been a unique sample of individuals interested in the subject of this study. To mitigate this threat to validity, the researcher compared differences

between the constructs of interest by data collection method and failed to identify a difference with any practical significance (e.g., medium to large effect size).

Instrumentation Limitations

One of the primary limitations of this investigation was the lack of established instruments to measure the constructs of interest. First, the researcher modified the FBI (Ellison et al., 2007) to create the ODI. While the ODI performed well with these data, it is possible that it did *not* do well to discriminate amongst lower-levels of intensity of online daters. That is, the instrument might have benefited from reducing the range of item responses to better differentiate levels of intensity of online dating amongst online daters.

Secondly, the researcher altered Zolot (2003) and Curran's (2004) unnamed instrument to create the SOOS. The SOOS performed poorly with these data, required several modifications (e.g., item removal), and was susceptible to socially desirable responses. A review of the items of the SOOS indicated that the instrument more accurately measured individuals' sexual interest in others as opposed to their objectification of others. Thus, the researcher determined that data acquired with the SOOS was not trustworthy, calling for the development of an instrument that can produce valid and reliable measurements of individuals' objectification of others.

It is necessary to note the limitations associated with self-report instruments (Gall et al., 2007). First, it is possible that participants falsely responded to items on the instruments. The researcher attempted to mitigate this threat to validity through the

utilization of the MCSDS-FA to detect social desirability in participant responses (Reynolds, 1982). Secondly, all instruments contain measurement error, which might have compounded differences between the actual and true values of the constructs of interest (Graziano & Raulin, 2004). The researcher attempted to mitigate against these limitations by using established instruments when available (e.g., ECR-RS, AMES, RAS); however, even established instruments are vulnerable to these threats to validity (Gall et al., 2007).

Recommendations for Future Research

Future research should consider the limitations of the current study. While this study established relationships between the constructs of interest, causality was *not* established. Thus, future researchers might consider examining causation between the constructs of interest. Additionally, due to the utilization of convenience sampling, the researcher recommends that future studies utilize random sampling and strive to attain greater levels of geographic representation as well as a more diverse and balanced sample (e.g., gender). Furthermore, researchers might consider partnering with online dating service companies to distribute research packets in order to ensure more balanced representation across online dating services. Overall, these recommendations would strengthen the findings of the current study and add to the literature regarding online dating.

The majority of studies that examine variables associated with online dating use have *not* used an established instrument to measure intensity of online dating use.

Therefore, the researcher recommends that future researchers attempt to use the ODI to test the convergent and divergent validity and factor structure of the instrument with diverse populations. Similarly, the objectification of others remains a difficult construct to measure. The literature on other-objectification would benefit from the creation and validation of an instrument to measure the objectification of others. With the validation of these instruments, the researcher recommends that future researchers reexamine the relationships between the constructs of interest in this investigation with diverse populations. Moreover, future research is warranted to further examine the relationship between empathy and the objectification of others, as the constructs relationship changed from inverse to parallel based on directionality.

Lastly, data from this investigation revealed that participants reported lower levels of romantic relationship satisfaction (as measured by the RAS; Hendrick, 1988) when compared to previous research (Hendrick et al., 1998). Thus, the researcher calls for future research to explore relationship satisfaction amongst more diverse populations of emerging adults. Further, if researchers confirm that the current generation of emerging adults possesses lower levels of romantic relationship satisfaction compared to other populations, researchers are recommended to explore factors that enhance or inhibit relationship satisfaction amongst emerging adults.

Implications

The findings from this investigation contribute to a growing body of literature regarding online dating, empathy, objectification of others, and emerging adults' quality

of romantic relationships. Specifically, the findings from this investigation provide (a) increased understanding of the relationship between online dating on empathy and objectification of others, (b) increased understanding of the relationship between empathy and objectification of others, and (c) increased understanding of the relationship between romantic relationship quality and empathy and objectification of others. The implications of the findings from this investigation are provided for counselors, counselor educators, and instrument development.

Implications for Clinical Practice

Emerging adults are a unique counseling population (Arnett, 2000; Siegel, 2013; Tao, 2013) made even more unique by their use of technology and the Internet (De Leo & Wulfert, 2013). Emerging adults' romantic relationships influence their sense of identity, self-concept, and well-being (Simon & Barrett, 2010). The results of the current investigation reveal that nearly one in three emerging adult college students currently use, or have used, online dating services, which is similar to statistics reported for adults by Smith and Duggan (2013). In contrast to researchers' concerns about online dating services creating an objectifying and evaluative environment (Hitsch et al., 2006; Heino et al., 2010; Rosen et al., 2008), it would appear that online dating service use is prevalent amongst emerging adults and online dating might be a viable option for emerging adult college students to pursue their relationship goals. Thus, the researcher calls for counselors to assess their own values and beliefs about the use of online dating services and to be open to exploring clients' use of online dating. However, the

researcher also recommends that counselors be aware of the individual or relational issues linked to online activity (Hertlein & Stevenson, 2010). As such, counselors should be prepared to provide psychoeducation to clients about the viability of online dating and to deconstruct the social stigma associated with it (Smith & Duggan, 2013). Despite positive implications associated with online dating, counselors should still recognize that some individuals might find the process to be objectifying (Hitsch et al., 2006; Heino et al., 2010; Rosen et al., 2008), and thus potentially harmful (Moradi & Huang, 2008; Strelan & Hargreaves, 2005). Overall, it is necessary for counselors to recognize the importance of technology and its role in emerging adult's relationships and to consider how their theoretical orientation accommodates emerging adults' use of online dating.

An important finding from this study was the confirmation that empathy continues to play a large role in romantic relationship quality (Cramer & Jowett, 2010; DeVille et al., 2015; Levenson & Gottman, 1985; Zurbriggan et al., 2011). Thus, counselors are recommended to consider how empathy deficits might be contributing to clinical issues in emerging adults' romantic relationships. The researcher encourages counselors to practice interventions that develop empathy with emerging adult clients – particularly emerging adult clients in romantic relationships – such as Imago therapy (Hendrix, Hunt, Luquet, & Carlson, 2015; Mason, 1996).

Furthermore, it is also necessary to note that the majority of participants in this investigation reported that they were pursuing a long-term relationship. The researcher recommends that counselors be aware of the seriousness of relationships that develop during emerging adulthood. As such, counselors are reminded to validate emerging adult

college students' experiences in their romantic relationships (e.g., the serious impact of a relationship ending).

Implications for Counselor Educators

Recommendations made by CACREP (2016) encourage the examination of contemporary societal issues in the counseling field, and counselors report being undertrained and unprepared to work with clients with issues related to intimacy stemming from online use (Goldberg et al., 2008). While "online use" pertains to a wide array of online activity, online dating is gaining in prevalence amongst Americans (Smith & Duggan, 2013). Thus, the researcher calls for an examination of how counselor educators can better prepare counselors-in-training to address clinical issues influenced by online activity. As it relates to online dating specifically, the researcher calls for contemporary discussion of the influence of online dating on emerging adult clients and their romantic relationships in CACREP accredited courses. The researcher recommends counselor educators familiarize themselves with the literature on online dating, and to facilitate discussion in exploring the beliefs and attitudes of counselors-in-training regarding the use of online dating in the context of (a) the formation, maintenance, and dissolution of relationships in couples counseling; (b) the role of empathy development; (c) the accommodation of the influence of technology and online dating on theoretical orientation; and (d) the use of clinical examples that involve clients who use online dating to pursue romantic relationships.

In addition to the dissemination of literature on online dating, counselor educators are behooved to explore the objectification of others. Szymanski and Carr (2011) called for counselor educators to recognize that the counseling field's emphasis on social justice advocacy necessitates an exploration of the negative effects of objectification as a form of oppression and its role in the mental health field. While limitations of this study inhibited the accurate measure of the objectification of others, the results of this study provide evidence of a strong negative relationship between the constructs of empathy and objectification of others. Thus, with a multicultural lens (CACREP, 2016), the researcher recommends that counselor educators consider the role of objectification in the domain of bias, privilege, and *ism* (Sue & Sue, 2013).

Implications for Instrument Development

The researcher utilized several instruments to measure the constructs of interest in this investigation. The researcher employed the ODI, AMES (Vossen et al., 2015), SOOS, ECR-RS (Fraley et al., 2011), and the RAS (Hendrick, 1988). Beginning with the ODI, the ODI was modified from the FBI (Ellison et al., 2007). After removing three items, the ODI performed well with these data, demonstrating similar internal consistency as previous research with the FBI (Ellison et al., 2007; Sherrell, 2013). However, the researcher recommends that future investigations reevaluate the distribution of possible item responses and consider modifying the instrument to better discriminate amongst lower-level users of online dating services.

The AMES had been used prior to this investigation with adolescent samples (Vossen et al., 2015). As far as the researcher is aware, this study was the first investigation to use the AMES with a sample of emerging adult college students. Based on the findings of this study, the *Sympathy* scale performed poorly with these data, and the instrument required several modifications (e.g., item removal) prior to providing a strong model fit with these data. Therefore, the researcher recommends that future researchers continue to explore the psychometric properties and factor structure of the AMES with emerging adult populations and consider using the modified instrument to assess for similar fit.

Researchers have experienced difficulty measuring individuals' objectification of others; this study was no exception. The researcher employed a modified instrument based on Zolot (2003) and Curran's (2004) unnamed instrument. The SOOS had *not* been validated prior to this investigation, and the instrument performed poorly with this sample population. The instrument produced several standardized residual covariance values above the threshold of 2.58 and demonstrated questionable internal consistency reliability. After several modifications (e.g., item-removal), the researcher identified an acceptable model for the instrument; however, item removal might have diminished the face validity of the instrument. Thus, the researcher calls for future researchers to create an instrument to measure the construct of objectification of others that produces valid and reliable results with populations of emerging adults.

The ECR-RS is arguably the strongest version of the original ECR (Brennan et al., 1998) and is used to measure participants' levels of anxious and avoidant attachment.

Overall, the instrument required modification (i.e. item removal, allowing error to covarying) in order to demonstrate acceptable model fit with these data. While the ECR-RS was normed with emerging adult populations in previous research (Fraley et al., 2011), the researcher recommends future researchers continue to explore the psychometric properties of the instrument in their research investigations in order to promote the acquisition of valid and reliable data.

The RAS has been used in multiple studies with a variety of populations to measure relationship satisfaction (Hendrick, 1988; Hendrick et al., 1998). The initial measurement model demonstrated poor model fit. However, after modifications to the model (e.g., allowing item error to covary), the model produced a strong fit. Researchers are encouraged to continue to use the RAS in order to compare differences in relationship satisfaction between populations and in relation to other constructs. However, the researcher recommends continued exploration of the psychometric properties of the RAS to assess for strength of model fit with different populations.

Chapter Five Summary

In chapter five, the researcher compared the findings from this investigation with previous research on the constructs of interest. The results from this investigation indicated that online dating use contributes to empathy and the objectification of others, which both account for noteworthy variance of emerging adults' quality of romantic relationships. Considering the poor performance of the SOOS with these data, the researcher tested an alternate model that removed the construct of objectification of

others and confirmed that online dating contributed to empathy, which accounted for notable variance of emerging adults' quality of romantic relationships with these data. However, it is necessary to interpret the results of this investigation with caution due to the limitations of this study. Overall, the findings of this investigation result in implications for future researchers, counselors, counselor educators, and instrument development. The findings from this study contribute to a growing body of literature regarding online dating, empathy, objectification of others, and emerging adults' quality of romantic relationships.

APPENDIX A:
UNIVERSITY OF CENTRAL FLORIDA INSTITUTIONAL REVIEW BOARD
APPROVAL LETTER



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1
FWA00000351, IRB00001138**

To: **Zachary Bloom and Co-PI: Glenn William Lambie**

Date: **August 20, 2015**

Dear Researcher:

On 08/20/2015, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: The Influence of Emerging Adults' Use of Online Dating on Their Levels of Empathy, Objectification of Others, and Quality of Relationships with Romantic Partners
Investigator: Zachary Bloom
IRB Number: SBE-15-11500
Funding Agency:
Grant Title: N/A
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

A handwritten signature in black ink that reads "Joanne Muratori".

Signature applied by Joanne Muratori on 08/20/2015 11:47:38 AM EDT

IRB manager

APPENDIX B:
EAST CAROLINA UNIVERSITY INSTITUTIONAL REVIEW BOARD APPROVAL
LETTER



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building - Mail Stop 682
600 Moye Boulevard - Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb

Notification of Exempt Certification

From: Social/Behavioral IRB
To: [Patrick Mullen](mailto:Patrick.Mullen@ecu.edu)
CC:
[Patrick Mullen](mailto:Patrick.Mullen@ecu.edu)
Date: 9/3/2015
Re: [UMCIRB 15-001516](#)
The Influence of Emerging Adults' Use of Online Dating on Their Levels of Empathy, Objectification of Others, and Quality of Relationships with Romantic Partners

I am pleased to inform you that your research submission has been certified as exempt on 9/3/2015. This study is eligible for Exempt Certification under category #2.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

APPENDIX C:
EXPLANATION OF RESEARCH (FACE-TO-FACE DATA COLLECTION)



EXPLANATION OF RESEARCH

Title of Project: The Influence of Emerging Adults' Use of Online Dating on Their Levels of Empathy, Objectification of Others, and Quality of Relationships with Romantic Partners

Principal Investigator: Zachary D. Bloom, M.A.
Faculty Supervisor: Glenn W. Lambie, Ph.D.
Dalena Dillman Taylor, Ph.D.
Psych Faculty Supervisor: Florian Jentsch, Ph.D.

Dear Student,

You are being invited to take part in a research study. To participate in this study, you must be 18 years of age or older and currently enrolled in *at least* one undergraduate or master's level course at a college or university. **You do not have to be a user of online dating services or applications to be eligible to participate in this study.**

The purpose of this research investigation is to explore the relationships between emerging adults' use of online dating and their quality of romantic relationships. The purpose is to identify how these constructs relate and contribute to one another.

If you wish to participate, you will complete six sets of questions regarding your use of online dating services and relational variables. In addition, you will be providing some general demographic information. Your participation in the study and any information you share is **anonymous**.

To complete, the data collection instruments should take no longer than **10-15 minutes**.

Your participation in this research project is **voluntary**. You do **not** have to participate. You do **not** have to answer any question(s) that you do not wish to answer. Please be advised that you may withdraw from the study at any time without consequence. *If you choose to participate in this study and complete the data collection items, you will receive **.5 SONA points**.*

Study contact for questions about the study or to report a problem:

If you have any questions, concerns, or complaints, please contact Zachary Bloom, Doctoral Student, Counselor Education Program, College of Education & Human Performance at (847) 204-0943; zbloom@knights.ucf.edu; or Dalena Dillman Taylor, Ph.D., (faculty supervisor), Counselor Education Program, College of Education & Human Performance at (407) 823-3063; Dalena.Taylor@ucf.edu; Glenn W. Lambie, Ph.D., (faculty supervisor), Counselor Education Program, College of Education & Human Performance at (407) 823-4779; Glenn.Lambie@ucf.edu; or Florian Jentsch, Ph.D., (psychology faculty supervisor), Department of Psychology and Institute for Simulation & Training, College of Sciences at (407) 823-1912; florian.jentsch@ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX D:
EXPLANATION OF RESEARCH (ONLINE)



EXPLANATION OF RESEARCH

Title of Project: The Influence of Emerging Adults' Use of Online Dating on Their Levels of Empathy, Objectification of Others, and Quality of Relationships with Romantic Partners

Principal Investigator: Zachary D. Bloom, M.A.
Faculty Supervisor: Glenn W. Lambie, Ph.D.
Dalena Dillman Taylor, Ph.D.
Psych Faculty Supervisor: Florian Jentsch, Ph.D.

Dear Student,

You are being invited to take part in a research study. To participate in this study, you must be 18 years of age or older and currently enrolled in *at least* one undergraduate or master's level course at a college or university. **You do not have to be a user of online dating services or applications to be eligible to participate in this study.**

The purpose of this research investigation is to explore the relationships between emerging adults' use of online dating and their quality of romantic relationships. The purpose is to identify how these constructs relate and contribute to one another.

If you wish to participate, you will complete six sets of questions regarding your use of online dating services and relational variables. In addition, you will be providing some general demographic information. Your participation in the study and any information you share is **anonymous**.

To complete, the data collection instruments should take no longer than 10-15 minutes.

Your participation in this research project is **voluntary**. You *do not* have to participate. You *do not* have to answer any question(s) that you do not wish to answer. Please be advised that you may withdraw from the study at any time without consequence. If you choose to participate in this study and complete the data collection items, you will receive .5 SONA points.

Study contact for questions about the study or to report a problem:

If you have any questions, concerns, or complaints, please contact Zachary Bloom, Doctoral Student, Counselor Education Program, College of Education & Human Performance at (847) 204-0943; zbloom@knights.ucf.edu; or Dalena Dillman Taylor, Ph.D., (faculty supervisor), Counselor Education Program, College of Education & Human Performance at (407) 823-3063; Dalena.Taylor@ucf.edu; Glenn W. Lambie, Ph.D., (faculty supervisor), Counselor Education Program, College of Education & Human Performance at (407) 823-4779; Glenn.Lambie@ucf.edu; or Florian Jentsch, Ph.D., (psychology faculty supervisor), Department of Psychology and Institute for Simulation & Training, College of Sciences at (407) 823-1912; florian.jentsch@ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX E:
GENERAL DEMOGRAPHIC QUESTIONNAIRE

GENERAL DEMOGRAPHIC QUESTIONNAIRE

Instructions: Please complete sections A-M by identifying the most appropriate option
(All of your responses are confidential and anonymous):

A. What is your age? _____

B. What is your gender?

- Female
- Male
- Transgender
- Other: (please specify) _____

C. What is your Race?

- Asian/Asian-American
- Black
- Multiracial
- Native-American
- Pacific/Islander
- White
- Other: (please specify) _____

D. What is your Ethnicity?

- Hispanic
- Non-Hispanic

E. What year in college are you?

- Freshman
- Sophomore
- Junior
- Senior
- Master's student
- Other: (please specify) _____

F. Which college/university do you attend?

- Please specify: _____

G. What is your major or area of study?

- Please specify: _____

H. Which of the following most accurately describes how you identify your sexual orientation?

- Bisexual
- Gay or Lesbian
- Heterosexual
- Other: (please specify) _____

Thank you! Please go on to the next section.

I. Please identify your current relationship status:

- Single
- Dating
- In a relationship
- Cohabiting
- Engaged
- Married/Partnered
- Separated
- Divorced
- Widowed
- Other: (please specify) _____

J. What are you looking for in your current or next romantic relationship? (please select *one* response)

- A date
- A sexual encounter
- A short-term relationship
- A long-term relationship

In this study, online dating refers to any website or telephone application that you use to meet potential romantic partners for a date, a sexual encounter, or a relationship. The following list (see below) presents examples of a few (but not all) online dating websites and telephone applications.

K. Describe your use of free or paid online dating services *in the past year*.

- I have *never* used online dating services (please skip questions "L" and "M")
- I have used online dating services before but *not* in the past year
- I have used online dating services in the past year
- I currently use online dating services

L. How many different online dating services have you used?

- 1 service
- 2 services
- 3 services
- 4 or more services

M. Which of the following websites or telephone applications have you had experience using? (Please circle as many as apply):

Badoo	Coffee Meets Bagel	Christian Mingle	Date Hookup
Down	eHarmony	Grindr	Hinge
How About We	JDate	Loveflutter	Match.com
OkCupid	Plenty of Fish	Tinder	Zoosk

Other: (please specify) _____

Thank you! Please go on to the next page.

APPENDIX F:
SEXUAL-OTHER OBJECTIFICATION SCALE

INSTRUMENT 1

Instructions: Please answer the following items in relation to potential romantic partners you encounter.

For example, a heterosexual female would respond to the following items in reference to other heterosexual males she encounters in person or online.

Strongly Disagree
Moderately Disagree
Slightly Disagree
Slightly Agree
Moderately Agree
Strongly Agree

1. The first thing that attracts me to a person is a nice body.	1	2	3	4	5	6
2. When I see an attractive person, I wonder what sex with them would be like.	1	2	3	4	5	6
3. I have made jokes about someone who is ugly or fat.	1	2	3	4	5	6
4. When commenting on someone's looks, it's ok to be crude.	1	2	3	4	5	6
5. I often imagine what someone would be like in bed.	1	2	3	4	5	6
6. I can tell a lot about a person's sexual availability by how they look.	1	2	3	4	5	6
7. I have made comments to friends about someone I find unattractive.	1	2	3	4	5	6
8. People should be used to hearing others talk about their bodies.	1	2	3	4	5	6
9. I often imagine what someone looks like naked.	1	2	3	4	5	6
10. I have rated people's level of attractiveness.	1	2	3	4	5	6
11. I enjoy it when an attractive person wears attractive clothing.	1	2	3	4	5	6
12. It is natural to comment on a person's physical features.	1	2	3	4	5	6

Thank you! Please go on to the next section.

APPENDIX G:
ADOLESCENT MEASURE OF EMPATHY AND SYMPATHY

INSTRUMENT 2

Instructions: We are going to ask you some questions about what you are like and how you normally behave.

Please indicate how often each statement has occurred in the last six months:

Never
Almost Never
Sometimes
Often
Always

1. I can easily tell how others are feeling.	1	2	3	4	5
2. I feel sorry for a friend who feels sad.	1	2	3	4	5
3. I can often understand how people are feeling even before they tell me.	1	2	3	4	5
4. I feel sorry for someone who is treated unfairly.	1	2	3	4	5
5. When a friend is angry, I feel angry too.	1	2	3	4	5
6. I am concerned for animals that are hurt.	1	2	3	4	5
7. When my friend is sad, I become sad too.	1	2	3	4	5
8. I can tell when a friend is angry even if he/she tries to hide it.	1	2	3	4	5
9. When a friend is scared, I feel afraid.	1	2	3	4	5
10. I can tell when someone acts happy, when they actually are not.	1	2	3	4	5
11. I feel concerned for other people who are sick.	1	2	3	4	5
12. When people around me are nervous, I become nervous too.	1	2	3	4	5

Thank you! Please go on to the next section.

APPENDIX H:
RELATIONSHIPS STRUCTURE QUESTIONNAIRE (ECR-RS)

INSTRUMENT 3

Instructions: Please answer the following questions about your *dating* or *romantic partner*.

Note: If you are not currently in a dating or marital relationship with someone, answer these questions with respect to a former partner or a relationship that you would like to have with someone.

Please indicate the extent to which you agree or disagree with each statement by circling a number for each item.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
-------------------	----------	-------------------	---------------------------	----------------	-------	----------------

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. It helps to turn to this person in times of need. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I usually discuss my problems and concerns with this person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I talk things over with this person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I find it easy to depend on this person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I don't feel comfortable opening up to this person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I prefer not to show this person how I feel deep down. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I often worry that this person doesn't really care for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I'm afraid that this person may abandon me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I worry that this person won't care about me as much as I care about him or her | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Thank you! Please go on to the next section.

APPENDIX I:
RELATIONSHIP ASSESSMENT SCALE

INSTRUMENT 4

In this study, a romantic relationship refers to a date, a sexual encounter, or a relationship.

For the next set of questions, please think about your current romantic relationship. If you are not currently in a relationship, please think about a previous romantic relationship. If you have not been in a romantic relationship, please answer the following questions based on your anticipated experience in a future relationship.

Instructions: The following questions are used to measure relationship satisfaction. Please select the response that best describes your relationship.

I am responding to the following items in reference to _____.

- A previous relationship
- A current relationship
- A future relationship

1. How well does your partner meet your needs?

1	2	3	4	5
Poorly		Average		Extremely Well

2. In general, how satisfied are you with your relationship?

1	2	3	4	5
Unsatisfied		Average		Extremely Satisfied

3. How good is your relationship compared to most?

1	2	3	4	5
Poor		Average		Excellent

4. How often do you wish you hadn't gotten into this relationship?

1	2	3	4	5
Never		Average		Very Often

5. To what extent has your relationship met your original expectations?

1	2	3	4	5
Hardly at all		Average		Completely

6. How much do you love your partner?

1	2	3	4	5
Not Much		Average		Very Much

7. How many problems are there in your relationship?

1	2	3	4	5
Very few		Average		Very Many

Thank you! Please go on to the next section.

APPENDIX J:
ONLINE DATING INTENSITY SCALE

IF YOU HAVE NEVER USED AN ONLINE DATING SERVICE, YOU CAN SKIP THIS SECTION. PLEASE CONTINUE ON TO THE NEXT ASSESSMENT...

INSTRUMENT 5

In this study, online dating refers to any website or telephone application that you use to meet potential romantic partners for a date, sexual encounter, or long-term intimate relationship.

Instructions: If you currently use a dating service, think about your typical use of your online dating account(s) in an average week. If you do **NOT** currently use online dating services, please answer the following items in regard to your typical use in an average week when you *did* use an online dating service.

Please refer to the following scale for the first three items.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neither Agree nor Disagree
- 4 = Agree
- 5 = Strongly Agree

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

- | | | | | | |
|--|---|---|---|---|---|
| 1. Using online dating services is part of my everyday activity. | 1 | 2 | 3 | 4 | 5 |
| 2. I feel out of touch when I haven't logged into my online dating account for a week. | 1 | 2 | 3 | 4 | 5 |
| 3. I would miss online dating if I had to suddenly stop using online dating services. | 1 | 2 | 3 | 4 | 5 |

Please select the response that best describes your previous or current use of online dating services...

4) How long have you used online dating services for?

- Less than one month
- 1 month to less than 3 months
- 3 months to less than 6 months
- 6 months to less than 9 months
- 9 months or longer

5) On average, how many times per day do you log on to your online dating service?

- One time or less per day
- 2 times per day
- 3 times per day
- 4 times per day
- 5 or more times per day

Thank you! Please go on to the next page.

- 6) On average, estimate how much time do you spend per day using online dating services (e.g., browsing, messaging, editing your profile)
- Less than 0.5 hours per day
 - 0.5 to 1 hour per day
 - 1 to 1.5 hours per day
 - 1.5 to 2 hours per day
 - More than 2 hours per day
- 7) How often do you edit your online dating service profile?
- 1 time or less per month
 - 2 to 3 times per month
 - 3 to 4 times per month
 - 4 to 5 times per month
 - 6 or more times per month
- 8) On average, how many messages or contacts (e.g., *like*, *wink*) do you send (with or without a response) to different potential dates in a week?
- Less than 10 messages or contacts per week
 - 11 to 20 messages or contacts per week
 - 21 to 30 messages or contacts per week
 - 31 to 40 messages or contacts per week
 - 41 or more messages or contacts per week
- 9) On average, how many different people do you communicate with from online dating (e.g., messaging, emailing, texting, and talking by telephone or video chat)?
- 5 people or less
 - 6 to 10
 - 11 to 15
 - 16 to 20
 - 21 or more people
- 10) Since using online dating services or applications, how many people have you met online and then gone on a face-to-face date with in total?
- 5 people or less
 - 6 to 10
 - 11 to 15
 - 16 to 20
 - 21 or more people

Thank you! Please go on to the next section.

APPENDIX K:
MARLOW-CROWNE SOCIAL DESIRABILITY SCALE – FORM A

INSTRUMENT 6

Instructions: Please respond to the following prompts by circling "true" or "false."

TRUE FALSE

- | | | |
|---|------|-------|
| 1. It is sometimes hard for me to go on with my work if I am <i>not</i> encouraged. | TRUE | FALSE |
| 2. I sometimes feel resentful when I don't get my way. | TRUE | FALSE |
| 3. No matter who I'm talking to, I'm always a good listener. | TRUE | FALSE |
| 4. There have been occasions when I took advantage of someone. | TRUE | FALSE |
| 5. I'm always willing to admit it when I make a mistake. | TRUE | FALSE |
| 6. I sometimes try to get even rather than forgive and forget. | TRUE | FALSE |
| 7. I am always courteous, even to people who are disagreeable. | TRUE | FALSE |
| 8. I have never been irked when people expressed ideas very different from my own. | TRUE | FALSE |
| 9. There have been times when I was quite jealous of the good fortune of others. | TRUE | FALSE |
| 10. I am sometimes irritated by people who ask favors of me. | TRUE | FALSE |
| 11. I have never deliberately said something that hurt someone's feelings. | TRUE | FALSE |

Please provide any general comments you have regarding this overall research investigation:

Thank you for your participation!

APPENDIX L:
EMAIL PERMISSION TO USE AND MODIFY THE RAS

RE: Permission to use the RAS
Hendrick, S <s.hendrick@ttu.edu>
Sun 7/26/2015 11:39 AM
Inbox

Zach,

You have my full permission to use the RAS in your dissertation research. Your topic sounds timely and interesting. For your convenience, I have attached a copy of the RAS (with scoring instructions), and two articles (which you likely have already) related to the measure's psychometric properties. I will look at that website, as it is not something with which I have been involved. It is amazing to me how the RAS has reached new generations and other countries. I wish you the very best in your research and future.

Susan Hendrick

Susan S. Hendrick, PhD
Paul Whitfield Horn Professor of Psychological Sciences, Ret.
Texas Tech University
Adjunct Professor – Clinical Faculty
Department of Internal Medicine
Texas Tech University School of Medicine

From: Zach Bloom [mailto:ZBloom@knights.ucf.edu] **Sent:** Saturday, July 25, 2015 6:20 PM **To:** Hendrick, S **Subject:** Permission to use the RAS

Dear Dr. Hendrick -

Hello, my name is Zach Bloom. I am a doctoral candidate at the University of Central Florida in the counselor education program. My dissertation will be examining the directional relationships between emerging adults' use of online dating (e.g., websites and applications) on their levels of empathy, objectification of others, and quality of romantic relationships. I am writing to you to ask for your permission to use your RAS instrument as part of my measure of romantic relationship quality. I am hoping to administer the survey both online format and face-to-face.

I also wanted to tell you that I found the information posted at <http://www.midss.org/relationship-assessment-scale-ras> to be extraordinarily helpful. I really appreciate the work you've done.

Thank you for your time and help!

Best,

Zachary D. Bloom, MA, RMHCI, RMFTI
Doctoral Candidate - Counselor Education
College of Education and Human Performance
University of Central Florida
Phone: (847) 204-0943
Email: ZBloom@knights.ucf.edu

APPENDIX M:
EMAIL PERMISSION TO USE AND MODIFY THE FBI

Re: Permission to use and modify the FBI
Nicole Ellison <enicole@umich.edu>
Fri 7/10/2015 10:15 AM

Hi Zach, Thanks for your note. I don't think you need to ask permission to modify a scale as long as you cite the source, but it's nice to reach out. We aren't really using FBI any more. We've found it's more useful to look at minutes of use, number of friends, number of 'actual friends' and then attitudinal measures independently as opposed to merging them as in FBI. Below there's a link to our page about the measures which might be useful. If you wanted to read some of our more recent work you can see how we treat different measures of use. Also, recent research in this area suggests that global measures of use aren't as useful as looking at what people are actually doing on these platforms (eg lurking v active participation). So I might think about those kinds of measures too.

Here's the page:

Hi,

Thank you for your interest in our measures. Information about the Facebook Intensity Scale is available here: <http://www-personal.umich.edu/~enicole/scale.html>

Note we've updated the measures we use for FB use and are instead using minutes, number of friends, and number of 'actual' friends.

You are welcome to use any of the measures as long as proper attribution is used. Please let me know if you have any questions. Good luck with your project!

Nicole

Nicole Ellison
Associate Professor
School of Information
University of Michigan

On Thu, Jul 9, 2015 at 3:09 PM, Zach Bloom <ZBloom@knights.ucf.edu> wrote:

Dear Dr. Ellison -

Hello, my name is Zach Bloom. I am a doctoral candidate at the University of Central Florida in the counselor education program. My dissertation will be examining the directional relationships between emerging adults' use of online dating (e.g., websites and applications) on their levels of empathy, objectification of others, and quality of romantic relationships. I am writing to you to ask for your permission to modify and use the FBI to measure intensity of online dating use. I am hoping to administer the survey both online format and face-to-face.

In my review of the literature on online dating, I found a deficit in established

instruments to measure the construct of online dating. However, I believe the FBI is an instrument that, if modified, might measure the construct quite well. With your permission, I was wondering if I could modify the FBI to tweak some of the items so that participants complete the assessment in relation to their use of online dating services (e.g., websites and phone applications) as opposed to Facebook. Of course, I will make sure that your instrument is properly cited in any publications that result from my dissertation.

I appreciate the work you have done and would love to hear any thoughts or ideas you might have about this idea. Thank you for your time and help!

Sincerely,

Zachary D. Bloom, MA, RMHCI, RMFTI
Doctoral Candidate - Counselor Education
College of Education and Human Performance
University of Central Florida
Phone: [\(847\) 204-0943](tel:8472040943)
Email: ZBloom@knights.ucf.edu

APPENDIX N:
PERMISSION TO USE AND MODIFY THE AMES

RE: Permission to use the AMES
Vossen, Helen <H.G.M.Vossen@uva.nl>
Fri 7/10/2015 3:00 AM

Dear Zachary,

Thank you for your interest in the AMES. You are free to use it as you like (with reference). Your study sounds very interesting. Good luck!

Best,

Helen

From: Zach Bloom [mailto:ZBloom@knights.ucf.edu] **Sent:** donderdag 9 juli 2015 20:43 **To:** Vossen, Helen **Subject:** Permission to use the AMES

Dear Dr. Vossen -

Hello, my name is Zach Bloom. I am a doctoral candidate at the University of Central Florida in the counselor education program. My dissertation will be examining the directional relationships between emerging adults' use of online dating (e.g., websites and applications) on their levels of empathy, objectification of others, and quality of romantic relationships. I am writing to you to ask for your permission to use your AMES instrument to measure empathy and sympathy in my study. I am hoping to administer the survey both online format and face-to-face.

I also wanted to tell you that I found the information posted at <http://www.ccam-ascor.nl/research-measures?id=393:ames&catid=54> to be extraordinarily helpful. I really appreciate the work you've done.

Thank you for your time and help!

Best,

Zachary D. Bloom, MA, RMHCI, RMFTI
Doctoral Candidate - Counselor Education
College of Education and Human Performance
University of Central Florida
Phone: (847) 204-0943
Email: ZBloom@knights.ucf.edu

APPENDIX O:
PERMISSION TO USE AND MODIFY THE ECR-RS

Re: Permission to use the ECR-RS
R. Chris Fraley <rcfraley@gmail.com>
Thu 7/9/2015 3:06 PM

Hi, Zach. Please feel free to use the instrument. Good luck with your research!

~ Chris

R. Chris Fraley
University of Illinois at Urbana-Champaign
Department of Psychology
603 East Daniel Street
Champaign, IL 61820
Internet: <http://www.psych.uiuc.edu/~rcfraley/>

On Thu, Jul 9, 2015 at 1:15 PM, Zach Bloom <ZBloom@knights.ucf.edu> wrote:
Dear Dr. Fraley -

Hello, my name is Zach Bloom. I am a doctoral candidate at the University of Central Florida in the counselor education program. My dissertation will be examining the directional relationships between emerging adults' use of online dating (e.g., websites and applications) on their levels of empathy, objectification of others, and quality of romantic relationships. I am writing to you to ask for your permission to use your ECR-RS questionnaire to measure attachment styles with romantic partners. I am hoping to administer the survey both online format and face-to-face.

I also wanted to tell you that I found the information posted at <http://internal.psychology.illinois.edu/~rcfraley/measures/relstructures.htm> to be extraordinarily helpful. I really appreciate the work you've done.

Thank you for your time and help!

Best,

Zachary D. Bloom, MA, RMHCI, RMFTI
Doctoral Candidate - Counselor Education
College of Education and Human Performance
University of Central Florida
Phone: [\(847\) 204-0943](tel:(847)204-0943)
Email: ZBloom@knights.ucf.edu

APPENDIX P:
CONSENT LETTER USED AT EAST CAROLINA UNIVERSITY

Dear Student,

You are being invited to participate in a research study titled “The Influence of Emerging Adults’ Use of Online Dating on Their Levels of Empathy, Objectification of Others, and Quality of Relationships with Romantic Partners” being conducted by Patrick R. Mullen, an assistant professor at East Carolina University in the Department of Interdisciplinary Professions. The goal is to survey 100 individuals at East Carolina University. The survey will take approximately fifteen minutes to complete. It is hoped that this information will assist us to better understand the relationship between students’ Online Dating, Levels of Empathy, Objectification of Others, and Quality of Relationships with Romantic Partners. The survey is anonymous, so please do not write your name. Your participation in the research is voluntary. You may choose not to answer any or all questions, and you may stop at any time. There is no penalty for not taking part in this research study. Please call Patrick Mullen at 252-737-1255 for any research related questions or the Office of Research Integrity & Compliance (ORIC) at 252-744-2914 for questions about your rights as a research participant.

If you wish to participate in this study, complete the included study materials and turn them into the researcher collecting the data. Do not include your name or other identifying information. If you do not wish to participate, turn in blank or incomplete survey materials.

Thanks for your consideration,

Patrick R. Mullen, Ph.D., NCC, ACS
Assistant Professor, Counselor Education
Department of Interdisciplinary Professions
East Carolina University
College of Education
E-Mail: mullenp14@ecu.edu
Office: (252) 737-1255

APPENDIX Q:
SURVEY DISTRIBUTION DIRECTIONS

September 9, 2015

Dear professor,

I wanted to thank you for your willingness to help me collect data for the completion of my dissertation study! Attached to this letter, you should find everything you need for your class. Please find (a) this copy of instructions for the distribution of data packets, (b) a letter of approval from the University of Central Florida's Institutional Review Board, (c) a marked number of data collection packets for your class(es), and (d) a thank you note for your assistance with this project.

- **Each Packet:** You will see that each packet contains an explanation of the research study (informed consent), a general demographic questionnaire, and six assessment instruments. The Explanation of Research explains that participation in this study is *optional*, participation is *voluntary*, and students can choose to withdraw from the study at any time without consequence. While the subject of the study regards the use of online dating, students do *not* need to have used online dating services to participate. The only requirement for participation is that students **must be 18 years old or older** and enrolled in at least one undergraduate or graduate course. The Explanation of Research page also contains information to contact me, supervising faculty, and the University of Central Florida's Institutional Review Board.
- **Distribution Instructions:** To collect data for this study, please provide one packet per student. I anticipate most students will require 10-15 minutes to complete the data packet. When students have completed their packet (or opted to not complete it), they can return it to you or to a designated location where it can be collected **anonymously**.
- **PLEASE NOTE:** Please notify students that the data collection packet contains printing on both sides of each page – excluding the first Explanation of Research page and the final assessment – and to please attempt to complete all applicable sections of the packet. Students who have *never* used online dating services can skip instrument 5; this is marked at the top of instrument 5.
- **Extra Credit or Incentives:** The use of incentives have *not* been standardized for this research investigation. THEREFORE, you are free to offer extra credit incentives to students for participating in this study. However, please remember that it is essential that data collection packets are collected anonymously. My personal recommendation is to offer extra credit on the honor system to students who say they participated in the study – whether that is done by verbal agreement, signing a separate sheet of paper (like an attendance roll call), or by just offering extra credit to the whole class. Of course, the amount of extra credit should *not* be

too substantial as to accidentally disadvantage students who choose to not participate.

- **To Return Packets:** Once your students have completed the data collection packets, please return them to Brandon Hollingshead, and he will ship them back to me in a box I have provided for him.

I sincerely appreciate your assistance with this project. If you have *any* questions or concerns, or if you would like additional information about my study, please contact me anytime: (847) 204-0943 or ZBloom@knights.ucf.edu. Thank you again for your time and help with this project!

Sincerely yours,

Zachary D. Bloom, MA, RMHCI, RMFTI
Doctoral Candidate - Counselor Education
College of Education and Human Performance
University of Central Florida
Phone: (847) 204-0943
Email: ZBloom@knights.ucf.edu

APPENDIX R:
EMAIL SOLICITATION TO ROLLINS STUDENTS

Dear counseling student,

Hello! My name is Zach Bloom. I am a former graduate of the Rollins Mental Health Counseling program, and I am a current doctoral candidate at the University of Central Florida in the Counselor Education program where I am currently working to complete my dissertation. I am writing to you to invite you to participate in my research investigation!

To tell you a little bit about my study, I am examining the influence of emerging adults' use of online dating on their levels of empathy, objectification of others, and their quality of romantic relationships. My study includes a general demographic questionnaire and six instruments for a total of about 75 questions. The entire study takes 10-15 minutes to complete.

To participate in my study, you need to be at least 18 years old and enrolled in at least one undergraduate or master's level class. You do *not* need to be a current or former user of online dating services. Your participation in this study is **voluntary**, and you may withdraw from the study at any time and without consequence. If you do choose to participate in the study, your responses will be **anonymous** and **confidential**. Please click the link below to go to the survey website (or copy and paste the survey link into your internet browser) to begin the survey.

Survey Link: [XXXX]

Your participation in this investigation is very important and will contribute to a growing body of research regarding the influence of online dating and romantic relationships. I appreciate your time and consideration in completing the survey. It is only through the help of participants like you that researchers can provide information to help guide the development of research regarding the counseling profession.

I sincerely appreciate your assistance with this project. If you have *any* questions or concerns, or if you would like additional information about my study, please contact me anytime: (847) 204-0943 or ZBloom@knights.ucf.edu. Thank you again for your time and help with this project!

Sincerely yours,

Zachary D. Bloom, MA, RMHCI, RMFTI
Doctoral Candidate - Counselor Education
College of Education and Human Performance
University of Central Florida
Phone: (847) 204-0943
Email: ZBloom@knights.ucf.edu

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