# ONLINE INTERACTION AND IDENTITY DEVELOPMENT: THE RELATIONSHIP BETWEEN ADOLESCENT EGO IDENTITY AND PREFERRED COMMUNICATION ACTIVITIES

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**Title**

Online Interaction and Identity Development: The Relationship Between Adolescent Ego Identity and Preferred Communication Activities

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

**DOCTOR OF PHILOSOPHY**

# ABSTRACT

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The purpose of this study was to evaluate the types of communication activities adolescents reported as important and used most frequently, and how these communication preferences were reflected in adolescents' identity development status. Participants were approximately 600 new university students who completed a survey regarding 18 communication activities, along with the Erikson Psychosocial Stage Inventory identity subscale.

Data analysis was conducted in two phases. To reduce the frequency and importance data to a manageable size, exploratory factor analyses and confirmatory factor analyses were conducted. Two identical factors were identified and validated related to the importance and the frequency of communication activities. The first factor comprised four items related to online "performance": online gaming, participation in virtual reality settings, live chat with strangers, and live chat with groups unknown to the individual. The second factor comprised four communication activities that occurred on social networking sites as individuals created lasting "exhibits" of themselves: updating a personal profile, viewing the profiles of others, posting status messages, and sharing pictures or other content (articles, jokes, videos) with others.

Analysis of means indicated that the three communication activities rated as most important and frequently used were face-to-face interaction, voice calls and text messaging.

These were followed by social networking activities, and then writing activities such as blogging. The performative activities identified in the exploratory factor analysis were ranked as least important and least frequently used.

Regression analysis revealed small but statistically significant negative relationships between the reported importance of performative activities and identity development status, and between the reported frequency of performative activities and identity development status. Small positive relationships were also identified between the importance of face-to-face interaction and identity development status, and the importance of voice phone calls and identity development status. Small positive relationships were also identified between the frequency of face-to-face communication and identity development, between the frequency of voice phone calls and identity development, and between the frequency of e-mail use and identity development.

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# CHAPTER ONE. INTRODUCTION

## Statement of the Problem

In previous generations, the setting for social interaction was traditionally limited by physical proximity between individuals as they communicated. The notion of "being with" has been described by Goffman (1963) using the term *colocation*, to indicate the physical distance between people and its impact on social interaction at a particular moment in time. Goffman contrasts the concept of colocation, which focuses exclusively on proximity, with *copresence*, which "renders persons uniquely accessible, available, and subject to one another" (p. 22).

Two friends sharing a meal are likely to have both colocation and copresence, because they are not only in close physical proximity, but they are also focused on one another and expect interaction; two strangers in adjacent seats on a bus are likely to have only colocation, but not copresence since interpersonal attention and immediacy are not expected. Electronic interaction tends to blur the distinction between colocation and copresence by changing perceptions of proximity and immediacy, and by providing for a constant sense of connection, visibility, and community with others.

While the telegraph, telephone and other long-distance communication channels extended the ability to "be with" others across distance, no technology has provided the same level of connectedness and broad scope of interpersonal access as the Internet. As Meyrowitz (1986) noted even before the rise of the Internet, electronic media have eliminated the need for physical proximity by creating an environment with "no sense of

place" and have moved individuals in society toward the perception that they are intimately connected with a community of others around the world, a notion that McLuhan (1962) referred to as the "global village."

This sense of constant connectivity engendered by online communication changes the nature of human interaction in a number of ways. It makes geographic separation virtually irrelevant, providing immediate interpersonal connections to family, friends, and peers, regardless of their location. Additionally, online communication facilitates interaction with strangers and social groups with shared interests in the local community and around the world. As a result, the Internet creates an overwhelming continuity of human connection through the always-on nature of cell phones, instant-messaging and real-time virtual environments, and the unblinking public persona of social networking Web sites such as Facebook or MySpace.

This new construction of interaction has brought about a redefinition of human relationship and community. And while the overall nature of interpersonal communication is important, it is particularly salient to the developmental understanding of adolescents, who require social interaction for differentiation from others and consolidation of identity (Erikson, 1959). By eliminating the need for proximity, online communication provides a constant connection to others, which impacts the social interaction required to accomplish the ego identity development process that is essential for adolescents. No longer do parents ask who their children are interacting with at a specific moment, but what is the nature of

the interaction that occurs as young people are *constantly* connected to the myriad companions, both familiar and unfamiliar, who inhabit their lives.

Erikson (1959) wrote that adolescence is a vital time during human development when the individual builds a cohesive sense of identity by interacting with others. Up until this point, the young person has occupied a variety of roles imposed upon him or her by the family and social setting — child, sibling, student, playmate, and many others. During adolescence, these roles coalesce into a unified identity. Those who fail to accomplish the task of identity consolidation are said to experience "identity diffusion"; they fail to establish their own sense of self and simply react to the social expectations within which they operate. Erikson wrote that when this occurs, "delinquent and outright psychotic incidents are not uncommon" (p. 97). As such, the process of identity development is important socially and individually, and it is essential to understand the way in which electronic communication activities facilitate or impede this process.

Identity development has typically been understood to occur through adolescent years of about 12 to 20 (Erikson, 1959; Westenberg, Blasi, & Cohn, 1998), but in recent years it has been understood to continue through an individual's mid 20s, especially in Western cultures (Arnett, 2004, 2006; Côté, 2006). During this time, young people choose media based on its ability to express and develop their social identity (Harwood, 1997; Peter & Valkenburg, 2006). Consequently, it is essential to understand the adolescents' need for interaction as they develop into mature individuals, and how those needs are reflected in their choice of online communication activities during late adolescence.

Myriad studies have addressed issues such as online disclosure (Quan-Haase & Collins, 2008; Stern & Taylor, 2007) and social engagement (Gross, Juvonen, & Gable, 2002; Tu, 2002), but as recently as 2008, Barker noted that there was little research addressing how young people actually use online interaction to develop their own ego identity. This study is an analysis of how the use of electronically mediated communication relates to the development of ego identity of young people just starting college. This research focus is important because first-year college students are at an age when identity development is particularly important and dynamic (Njus & Johnson, 2008), and their separation from family of origin frequently presents a dramatic and previously unexperienced opportunity to explore peer relationships (Fleming & Anderson, 1986). Additionally, for many young people starting college represents the first opportunity to experiment with identities that transcend the social structures and expectations they have known since childhood (Bukobza, 2009).

Studying the impact of electronically mediated communication on identity development can be challenging on several fronts. Social Information Processing theory (Walther, 1992) indicates that online relationships may take more time to develop than face-to-face relationships. Therefore, it is essential to consider the amount of time spent using online communication and how important young people consider these communication activities in their ability to function socially.

The primary issue addressed in this study is how the use and perceived value of online communication relates to identity development. In many instances, individuals use

electronically mediated communication to build and maintain connections to those with whom they already have a relationship. This not only takes the form of self-disclosure through photos and text messages, but it also allows greater surveillance of one another, thereby providing more opportunities for behavioral modeling, which is part of the identity experimentation process. Additionally, instant-communication features of online communication allow mundane interaction and coordination of face-to-face activities that may keep young people better connected with peer groups within which identity development can occur.

The research evaluates the developmental status of beginning college students as it relates to their self-reported preferences and various communication activities. The intent of this study is to evaluate potential relationships between the identity development status and the forms of communication that young people use and report as important to their presentation of self with others. Fundamentally, the research proposed here asks whether human development occurs differently in the Internet age. A better understanding of this question will allow greater insight into how schools and other social institutions can prepare, challenge and support the development of young people in society.

# CHAPTER TWO. LITERATURE REVIEW

The growth of new communication technologies in recent years has significantly increased the ability of individuals to interact with others in different ways and in different mediated contexts. In spite of this, some research indicates that the many foundational aspects of human interaction remain the same. For example, recent research into the use of the Facebook social networking Web site indicates that even though people can now easily stay connected to many more individuals than they have in the past, they continue to have only a handful of close friends. As one social network researcher recently noted, "On Facebook, you've got a few close friends and lots of people you barely know.... We end up staying in touch with more acquaintances. But that doesn't mean we have more friends" (Lehrer, 2009, p. 130).

Similarly, ego identity consolidation — the process of experimentation and evaluation that ultimately leads to maturation into adulthood — remains a basic human need that is accomplished through a variety of communication activities that use multiple technological channels. For young people, research indicates that preferences toward certain communication activities vary based on the medium's perceived effectiveness as a mechanism for them to present themselves to their peers (Peter & Valkenburg, 2006).

This research focuses on several primary constructs: ego identity, mediated communication, adolescence and emerging adulthood. These last two items are, for the purposes of this research, being addressed together because although identity development has traditionally been situated primarily in adolescence (Erikson, 1959, 1977; Gray, Ipsa, &

Thornburg, 1986; Marcia, 1980), recent research indicates that it now extends into an individual's mid 20s, a period referred to as "emerging adulthood" (Arnett, 2004, 2006; Côté, 2006). In reviewing the literature on these topics, the chapter offers an analysis of how these constructs have intersected in previous research and a research design that seeks to address the relationship between adolescents' identity development status and especially their preferences toward various forms of electronically mediated interaction.

## Primary Constructs

### *Adolescence and emerging adulthood*

Adolescence is, in most Western cultures, tied to the physiological processes of puberty, which typically begin around ages 11 to 13. Puberty lacks a clear endpoint but is typically considered to be completed by the late teens or early 20s (Sebald, 1968). More recent research has sought to identify physical markers that indicate the end of puberty including the closure of bone growth (around age 16 for females and age 17.5 for males) and the maturation of neurochemical processes such as the ability to maintain regular sleep patterns, which typically occurs between 19 and 21. (Roenneberg et al., 2004).

Sociologically, Western culture has traditionally understood adolescence as a transitional period and not as a discrete phase of life. Rather, puberty is often perceived as a discontinuity during which the individual makes the transition from childhood to adulthood (Sebald, 1977). Since notions of childhood and adulthood vary by culture, the concept of adolescence as an intermediate period is often not constructed in solely physiological terms, but is delineated more broadly by social rituals and behaviors.

How and when this transition to adulthood occurs can vary by culture. Triandis (1989) wrote that the social institutions and expectations of a given culture have a significant impact on the duration, processes and potential outcomes of maturation into adulthood and coming-of-age rituals. He suggests that one of the primary factors that can affect this process is how "tight" or "loose" a culture is with regard to the freedom it allows young people as they are making identity choices. In particular, less complex societies often impose rigid constraints on the choices available to young people in taking on adult roles. Additionally, Triandis argues that such contextual variations not only influence the socially acceptable outcomes that young people can achieve, but also the types of cognitive processes by which individuals compare their public and private selves as they seek to define an identity for themselves.

Central to the notion of adolescence is the focus on taking on a cohesive adult persona or ego identity (Kroger, 2004). Much of the literature on ego identity development over the years has focused on processes of individuation that occur during the pubescent years. This focus on the identity development among teenagers is likely due to Erikson's influential work in this area. However, even Erikson (1950, 1959) wrote that such changes are not strictly bound to chronological age, but can be tied to coming-of-age rituals and may vary depending on cultural and historical contexts within which the individual lives. In addressing Western cultural variations in the identity development process, Côté (2006) wrote that

> extensions of the identity [development] stage beyond adolescence now appears to be a normative event in postindustrial societies, in which the workforce participation of adolescents and emerging adults has become a source of cheap labor and the higher educational credentials are essential for stable employment.... This prolonged education-to-work transition delays the assumption of adult roles and enhances the reality-based resolution of the identity stage. (p. 86)

Arnett (2007) echoes a similar sentiment and ultimately defines the term "emerging adulthood" to describe the period between the late teens and mid-20s that is marked by identity exploration in the areas of work and relationship, instability in life purpose, a focus on self, a feeling of being in-between adolescence and adulthood, and sense that life is filled with transformation possibilities (Arnett, 2006). In describing this newly defined stage in life and its role in ego development, Arnett wrote:

> What has changed since Erikson postulated the identity crisis is that it now takes place mainly in emerging adulthood, not adolescence.... The first tentative steps toward an adult identity may take place in adolescence, but identity explorations become more prominent and serious in emerging adulthood" (2007, p. 24).

Given this relatively recent change in how identity is situated in the life span, some of the studies cited in this research address identity development as occurring in adolescence, and some focus on identity development in emerging adulthood, the years between 18 and 25. Since the subjects of this study are first-year college students, typically 18 or 19 years old, they fall within the definition of adolescence and also within Arnett's (2004, 2006,

2007) definition of "emerging adulthood" as a time of identity exploration. Thus, research on both adolescence and emerging adulthood will be referenced with regard to those individuals undergoing the ego identity development processes that are the focus of this study.

Throughout this study, the term "emerging adulthood" will be used where it is specifically used by a source; however, use of that descriptor is relatively new and is therefore not dominant in the literature. Therefore, for the sake of clarity, the words *adolescent* or *adolescence* will typically be used to describe the individuals who are the focus of this study.

*Ego identity and identity development*

Ego identity was defined by Erikson (1959) as "the accrued confidence that one's ability to maintain inner sameness and continuity (one's ego in a psychological sense) is matched by the sameness and continuity of one's meaning for others" (p. 94). In short, identity development is the sense that an individual is able to present himself or herself to others as a genuine person.

Integral to the process of identity development among young people is interaction with others with the goal of achieving validation of self. Homophily, the tendency to engage with those who are similar, naturally results as adolescents seek to see themselves mirrored in others. As young people reach late adolescence, the process of individualization from their families of origin becomes important, and identification with peer groups becomes even more essential (Fleming & Anderson, 1986).

The notion of identity can be circumscribed from a variety of perspectives. Ethnic identity, social identity, national identity, and personal identity are all self-perceptions that impact the individual's sense of individuality in relationship to the world. Key to all of these is ego identity, which creates the cognitive foundation that allows an individual to be conscious of him- or herself (Levine, 2003). As such, ego identity is a "process of reflexivity or self-awareness" (Côté & Levine, 2002, p. 70) that allows the individual to be simultaneously subject and object to oneself (Gecas & Burk, 1995).

In other words, the ego identity is the cognitive phenomenon by which an individual can be the "object" being observed and the subject doing the observing. Côté and Levine (2002) wrote that conceptualizing this ability to reflect upon oneself is postulated on the notion that there is an identity that exists "beneath" the changing outside narratives that one presents to the world that would more accurately be referred to as the self or the self-representation (Erikson, 1959, p. 158). Moreover, the notion of ego identity is grounded in the sense of personal autonomy or agency, which exercises some level of control or engagement over the personae being presented to the world.

In simplest terms, Kroger (2004) wrote that the process of identity development is the "task of self-definition" (p. 1) that occurs when the individual consolidates the various roles and contexts of his or her life experience into a unified persona. This developmental process is both personal and contextual as it "depends on the interplay of what young persons at the end of childhood have come to mean to themselves and what they now appear to mean to those who become significant to them" (Erikson, 1977, p. 106).

During this important phase in human development, existing social groups are an essential part of the process because they provide opportunities for young people to model the behavior of peers. For boys, this modeling tends to occur in the context of shared activities. For girls, such interactions tend to take the form of sharing private feelings and thoughts with one another (Sullivan, Perry, Gawell, & Cohen, 1953).

For both sexes, the goal of the interaction is to test feelings and identities, and ultimately, to affirm one's own views of the world and of self. Larson and Richards (1994) wrote that interacting with peers is particularly important because it provides a sense of safety and commonality with peers. They wrote that "At an age when one's sense of self is fragile, knowing that a friend understands and feels what one feels is profoundly reassuring" (p. 92).

In Western culture identity consolidation process may occur during a period of moratorium, when young people are given license to explore personal and social roles as they choose a career path, lifestyle, and relationships. Erikson and Erikson (1997) wrote that "the later school and college years can... be viewed as a psychosocial moratorium: a period of sexual and cognitive maturation and yet a sanctioned postponement of definitive commitment. It provides a relative leeway for role experimentation, including that with sex roles" (p. 75).

For the purposes of this research, the terms *identity* and "ego identity" will be used interchangeably to refer to the cognitive and psychological phenomena of self-definition. Erikson's (1959) theory of ego identity posits that this element of the human psyche

progressively manifests itself during the human development process; consequently, the use of this term is not static, but implies a focus on the extent to which identity has coalesced into a meaningful property.

The terms *development* and *status* are used in this research to describe the dynamic and static disposition of the ego identity, respectively. In the case of the former, identity is considered part of an ongoing process. In contrast, *status* refers to the existential character of the individual at a given time. The identity development portion of the Erikson Psychosocial State Inventory is the objective measure by which identity status is quantified in this research.

*Communication activities*

Walther and Burgoon (1992) distinguish the term "communication channel" as the primary medium by which information is conveyed. For example, they define computer-mediated communication as a channel. Because the intent of this research is to address the specific behaviors that young people prefer, the more specific term "communication activity" was employed to focus attention communicative behaviors rather than technology. Additionally, this more active term is used to distinguish the fact that within certain communication channels different types of interaction may occur. For example, in a social networking site on the World Wide Web, an individual may perform a variety of activities intended to share information with others.

Therefore, throughout this research the term "communication activity" is used to describe the behavior employed to accomplish interaction between people. This relatively

homogenous term was chosen rather than "online communication" in order to include phone calls (via cell phone or traditional wired phone) and face-to-face communication. The former are certainly electronically mediated, although many do not perceive that in the same manner as computer-based communication. (Additional rationale for the inclusion of these items is provided in the Methods section of this research.) Electronically mediated communication is certainly the focus of this study; however, because communication behaviors related to human development are not limited to computer tasks, it was necessary to address broader communication options when gathering and analyzing data for this study.

Pollak (2010) defines "online communication" as "human-human interaction that is enabled through internet connection" (p. 73). Unfortunately, Pollak's definition fails to consider that cellular phones are now utilized more frequently for data connections such as e-mail and text messaging than they are for making telephone calls (Wortham, 2010). Therefore, his use of the term *internet* is problematic. For the purposes of this study, the definition for online communication is a modification of Pollak's explanation: "human-human interaction that is enabled through an *electronic network*."

Finally, the term "social networking" is used throughout this research, typically with reference to variety activities conducted on Web sites primarily intended for interaction with friends, family or acquaintances. For the purposes of this research, Boyd and Ellis' (2008) definition is used: an online communication service that allows individuals to "(1) construct a public or semi-public profile within a bounded system, (2) articulate a list of

other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (p. 211). Hogan (2010) notes that such sites are also exhibitive in nature, presenting a platform for the display of personal information intended to last over some period of time. Consequently, the second point of Boyd and Ellis' definition will be modified as: construct a public or semi-public profile of the self that is intended to last over time within a bounded system.

## Identity Development in Adolescence

Although the study of human development is diverse, Lerner (1997) delineates three primary epistemological approaches to the field: differential, ipsative, and stage-based. The least-used of these three approaches to human development, which is known as ipsative or idiographic, focuses on each individual as a unique expression of biological and social interaction that can be studied as a phenomenon in itself (Lerner, 1988). This approach is necessarily empirical and exploratory in nature, but is fundamentally based on the understanding that intrapersonal norms exist and are observable. Such an approach assumes that the "basic, lawful character of the person and his or her life span make requisite developmental analyses focusing on the individual and on the role of individuality in development" (Lerner, 1988, p. 31).

The differential approach is largely inductive, and ostensibly empirical and exploratory, rather than theoretical. Functionally, this understanding of human development focuses on specific demographic groups of individuals. The differential approach rejects the notion of developmental stages that are "species-specific, uniform,

unavoidable, inevitable, irreversible, and directed toward achieving a mature adult state" (De Corte & Weinert, 1996, p. xx). Instead, advocates of this approach seek to identify relationships between selected statuses (e.g., age, sex, race), and behavioral and psychographic attributes such as extroversion-introversion. Such studies typically employ longitudinal methods and are generally used to identify "sleeper effects" of early experiences that may not appear until later in life (Nadelman, 2004, p. 13).

Neither of these previously mentioned approaches lends itself particularly well to the questions addressed in this study. Differential approaches reject the notion of predicable life stages. Consequently, it would be possible to evaluate identity development among university students using differential methods, but both differential and ipsative approaches assume that there can be no a priori assumption that those subjects would necessarily be at any given point in the identity development process. Nor could it be assumed that at any given point there would be any relationship between the use of or preference toward any particular communication activities and developmental status. Similar considerations exclude an ipsative approach to the research presented here, with the additional qualification that such methodologies presume a focus on essentially psychological phenomena, which are outside the purview of this research and researcher.

Therefore, the theoretical basis for this research is the most common approach to human development, which is known as stage-based developmental theory. This methodology is typically referred to simply as developmental theory because it was systematized before differential and ipsative approaches (Lerner, 1997). Central to the

developmental approach to human lifespan is the notion of transformational stage. Kroger (2004) wrote that stage-based developmental theories are fundamentally different from linear approaches to human lifespan, which focus on human progression through life as an uninterrupted stream of changes that make certain human characteristics more or less pronounced. Rather, stage-based developmental approaches delineate distinct periods in the life cycle that comprise a "process of qualitative stage reorganization rather than a mere unfolding of static personality characteristics" (p. 9).

*Contextual focus in developmental theory*

An important characteristic of developmental theory is the focus on organismic versus mechanistic explanations. Mechanistic approaches assume that all human experience can be explained through the lens of the natural sciences. Such explanations assume that it is possible to "understand psychological functioning by reference to the mechanisms of physics and chemistry" (Lerner, 1997, p. 44). The mechanistic model is, therefore, built on the understanding of the "universe as the great Newtonian machine" (Reese & Overton, 1970, p. 130) and reduces human behavior to an expression of biochemical processes.

By contrast, the organismic model focuses on the individual (i.e., the organism) as an integrated whole that functions according to the "laws that cannot be found in the study of the isolated parts separately" (Roeckelein, 2006, p. 250). This understanding brings to bear the issue of social context as a key component in development and gives rise to "developmental contextualism," which emphasizes the processes that occur as the

individual and his or her social context interact over time (Kroger, 2004). Erikson (1959) in particular notes that one of the key components is the understanding of an individual's identity as "an inner solidarity with a group's ideals and identity" (p. 109).

Kroger (2004) noted that this complicated interplay between the individual and the social and physical environment is at the core of the contextualist approach to human development. She wrote:

> In short, in developmental contextualism the person-context relation is understood as an organization of mutually influential variables... changing over time.... It is not the study of person in context, but rather study of the interaction among many individuals and contextual systems and their influences on one another. Thus, a developmental contextualist would look at how different personal and contextual factors... reciprocally interact and influence one another to create change in... identity over time. (p. 5)

This approach to understanding human nature is particularly salient to this study because it integrates the individual with the social — which is to say the communicative — environment. It is this emphasis on the communicative context within which the individual functions that is the focus of this research. That context is explored in more depth in the next section.

*Underlying premises of ego identity development theory*

Marcia (1987) identified six major premises that underlie the primary structure of the contextualist ego identity development theory first proposed by Erikson (1950). First,

"identity formation occurs within a sequence of developmental stages" (p. 164). Because the stages of human development identified by Erikson are sequential and closely linked, the process of ego identity development is affected by stages that come before and impacts the resolution of future stages. Consequently, ego identity resolution cannot be decontexualized from the overall course of human development within which it occurs.

Second, Marcia (1987) wrote that identity is a psychological process, similar to Piaget's cognitive development structures, which requires the individual to revisit the perceptions grounded in earlier phases. It is during this re-evaluation of perceptions that the individual begins to "step back" and objectify his or her own perceptions of self and others. This process ultimately leads adolescents to perceive what they mean to themselves and to those around them; this definition is the ego identity.

Marcia's (1987) third and fourth major premises are an extension of Erikson's (Erikson & Erikson, 1997) "epigenetic principle," which states that human development is "the result of ongoing, bidirectional interchange between heredity and the environment" (Santrock, 2007, p. 96). In describing this third premise, Marcia (1987) wrote:

> The cognitive, physiological and social-expectational ingredients necessary for a mature identity are present for the first time at late adolescence. Although precursors to identity exist in prior developmental stages, adolescence is at least the crucial, and, perhaps the critical, period for the formation of the first full identity configuration. (p. 165)

Similarly, Marcia's (1987) fourth premise proposes that ego identity development arises as both the sum of the individual's childhood experience and the synthesis of these influences as constructed by the individual. The degree to which identity is conferred by the social order or constructed by the individual will vary depending on the amount of freedom afforded by the culture within which an individual functions (Triandis, 1989).

Marcia's primary research within the area of ego identity development has addressed measuring the status of an individual across various domains of experience as he or she addresses the crisis of identity (Kroger, 2003; Marcia, 1980, 1987; Schwartz, 2001). Consequently, Marcia's (1987) fifth premise is that various areas of an individual's life may reflect different stages of identity development. For example, a young person may have clearly resolved his or her identity with regard to occupation, but may still be undergoing identity formation in the areas of sexuality or religion. Overall, Marcia wrote, identity can be considered in toto across these spheres of life, but some areas may be more or less developed than others.

Finally, Marcia (1987) proposes that identity continues to change throughout an individual's lifespan, but that it is not as fluid after adolescence. Consistent with his sixth premise, adolescence presents the "perfect storm" of biological, social and cognitive factors for the ego identity to develop. At no point before or after do these same phenomena align to provide for such dramatic opportunities for self-definition. Additionally, subsequent developmental stages build upon the ego identity that is consolidated in adolescence, thereby cementing in some manner the outcome of that crisis.

*Ego identity development processes*

What makes developmental contextualism so appropriate for this research is that it privileges the individual's interaction within the social setting, and therefore privileges the communication environment within which identity development occurs. Consequently, the following section will present the key understandings and facets of identity development, and how it occurs in the social and communicative setting.

*Identity synthesis in adolescence*. Influenced by Freud's psychoanalytic theory, Erik Erikson's work in human development sought to emphasize ego identity development, rather than id and libidinal drivers. Marcia (1987) describes Erikson's focus on ego development as the core of developmental theory based on the appearance of "progressively more structured and sophisticated processes intervening between impulse and expression that establishes ego psychoanalytic theory as an extension of, rather than as an alternative to, more id-oriented psychoanalytic theory" (p. 161).

In other words, while Freud emphasized the psychosexual drivers of human behavior, Erikson's approach drew attention to the processes by which the individual moves from acting purely on impulse, to the stage when the individual begins developing a consolidated ego identity that allows him or her to act in an ostensibly autonomous and deliberative manner within the social setting. Franz and White (1985) argue that Erikson's entire body of work on human development privileges the issue of identity in proposing a "hierarchically ordered sequence of stages which progress from initial narcissistic

involvement with oneself, through stages of identification and socialization, to increasing individuation and establishment of an individual identity" (p. 224).

In contrast to Freud, Erikson espoused a largely optimistic approach to human interaction, which focused on healthy function within the social setting, rather than the pathological issues and developmental deficits that dominated psychoanalytical approaches (Kroger, 2004). In Erikson's approach, the creation of identity begins during childhood as the individual first perceives and then seeks to emulate another person; during the identity consolidation process, the individual is able to selectively embrace and discard characteristics of others. The social setting influences this process as the physical and social environment sanction, either positively or negatively, the behaviors and roles adopted during adolescence.

Erikson presented ego identity development as the fifth stage of an eight-stage sequence of life conflicts or crisis points in human development from birth to old age and death. These stages were, in Erikson's view, rigid and necessary to the healthy development of the individual. According to Lerner (2002), a foundational element of Erikson's theory was that "A person *must* develop what is supposed to be developed in each stage of development or else there will *never* be another chance" (p. 429. Italics in original.).

The earliest crisis stage in Erikson's development process addressed *trust versus mistrust*. Based on Freud's biological focus on the oral fixation of infants, Erikson identified this first stage of human development as a time when the child learns to trust the

parental figure to provide what is needed, particularly in the area of feeding (Lamb, Bornstein, & Teti, 2002). Central to this phase of development is the process of individuation, by which the child "differentiates itself from its primary caregiver" (Kroger, 2004, p. 16). Thus, the foundations of ego identity development are already being formed in the earliest human experience.

During the second crisis stage, which Erikson (1950) described as *autonomy versus shame*, children learn to distinguish themselves from others with regard to their own motor skills and bodily actions. This stage typically occurs at ages two and three and corresponds to Freud's anal phase during which the child learns to control excretory and other bodily functions (Hurrelman & Hamilton, 1996). This stage of development has a particularly important role in the establishment of cognitive mechanisms that allow individuals to control impulsive and compulsive behavior as they move from childhood into adolescence and adulthood (Evans, Forney, Guido, Renn, & Patton, 2009). It is this later transition from reactive organism to deliberative individual that is foundational to identity development.

During the fourth and fifth years of life, children experience Erikson's (1950) third stage or crisis of human development, which he refers to as *initiative versus guilt*. The focal point during this time is the ability to initiate action within the social environment. In previous stages, the child has established the notion of being a person; during this stage "the child must find out *what kind* of person he is going to be" (Erikson, 1959, p. 78. Italics in original.). Erikson goes on to note that this age provides the grounding for imagination, which establishes the foundation for identity experimentation later. At this stage of life,

children also develop a conscience or a moral awareness of the world around them (Evans, Forney, Guido, Renn, & Patton, 2009).

During a child's elementary school years, he or she deals with the crisis of *industry versus inferiority* (Erikson, 1950). In most cultures, this is the period in life when the child develops basic work skills including, in most Western cultures, the ability to read, write, and do basic arithmetic (Hurrelman & Hamilton, 1996). Erikson and Erikson (1997) wrote that at this stage in development the child "learns to love to learn as well as to play" (p. 75) in a manner that builds a sense of structure and intentional outcome which leads to a sense of achievement and competence. They wrote that the failure to achieve this sense of industry can lead to ongoing feelings of inferiority or incompetence throughout life.

Although Erikson presents eight steps in human development, the fifth step, *identity versus identity diffusion,* is the final stage addressed in this research. Kroger (2004) wrote that Erikson first articulated the concept of "ego identity" in working with World War II veterans who experienced a loss of continuity or sameness in their identity because of their combat experiences. The outcome of Erikson's experience was a realization that "identity seems to be most easily definable through its absence or loss," (Kroger, 2004, p. 18). Later expansion of his work on identity, Kroger noted, lead Erikson to ultimately define ego identity as the personal reality that arises from biology, personal organization of experience, and the culture within which an individual functions.

*Stages of identity development.* Erikson (1959) articulated the ego identity development stage in terms of two dichotomous statuses: Identity and Identity Diffusion.

The former represented the state at which the individual had largely accomplished the task of self-definition and was thereby equipped to proceed into future developmental stages. Those who experienced identity diffusion had neither wrestled with their competing identity options nor had they reached any sort of resolution about their own nature. Because these individuals were essentially ungrounded in their self-perception, they tended to be especially vulnerable to the influences of others.

Building on Erikson's overall understanding of development as a process, Marcia (1966) expands on this dichotomous model by adding two alternatives that are "roughly intermediate" (p. 552) between Identity (which Marcia described as Identity Achievement) and Identity Diffusion. He wrote that there are four possible statuses of young people in the identity development process, and argues that "any late adolescent (ages 18 to 22) should be categorisable into one of these four statuses" (p. 162).

Across each of these four stages, there are two primary processes or tasks occurring within a young person's psyche. *Exploration*, which is also referred to as *crisis* in earlier literature (Marcia, 1980), is the process individuals experience when they are faced with alternative identities for themselves. Typically during this process individuals experiment with different identities, and begin to evaluate which are most applicable to themselves. During the *commitment* process, a resolution (consciously or unconsciously) is made to embrace a particular self-definition (Luyckx, Goossens, Soenens, Beyers, & Vansteenkiste, 2005). These two processes are related, but are mutually exclusive; one can occur, or even be completed, without the other.

The most advanced of these stages is the *Identity Achievement* stage, at which point the subject has experienced identity exploration and committed to a particular definition of self (Marcia, 1980). Identity Achievement is considered by some to be essential to normal development, and consequently researchers have paid particular attention to factors that may support or interfere with its success (Lightfoot, Cole, & Cole, 2008).

Central to reaching Identity Achievement is the activity of experimentation, during which the individual "tries on" various roles. Kernis and Goldman (2011) observed that "research on identity statuses demonstrates that optimal well-being occurs when individuals experience identity achievement by resolving their identity crises through engaging in high levels of exploration..." (p. 341). As noted earlier, online interaction provides unprecedented opportunities for identity experimentation. An analysis of which communication activities young people employ for this purpose is the focus of this research.

*Identity Diffusion* occurs when the individual has neither faced a crisis nor committed to a particular ego identity. This is the stage at which many individuals enter adolescence, as they have not wrestled with the issue of identity or accepted those identities attributed to them by previous life experience. For those individuals who permanently remain in Identity Diffusion, their failure to accomplish both exploration and commitment leaves then unprepared to move to the next stage of development, which enables them to successfully achieve intimacy with another person. Turner (2011) wrote that failure to move beyond

identity diffusion leaves the individual psychosocially impaired because "without a firm sense of personal identity, one does not accrue the ego strength of fidelity ...is unable to be true to self, and lacks the capacity to be faithful to another" (p. 563).

In addition to Erikson's (1950) original primary identity statuses previously described, Marcia (1980) extended identity development theory to include *Moratorium* and *Foreclosure*. Erikson had already used the term *moratorium* to describe the point in the identity development process at which the individual is engaged in exploration, but Marcia refined the definition of the term. Some scholars see the Moratorium stage, which is typically a precursor to Identity Achievement, as a largely contemporary social convention that is often linked to college years, when young adults enjoy a period of extended adolescence and are permitted to defer identity choices (Head, 1997). Indeed, Triandis'(1989) argument that identity exploration options are typically constrained — sometimes rigidly so — by the cultures within which they occur, certainly supports the contention that Moratorium is not a universal feature of human development in all places.

*Foreclosure* is the fourth stage that Marcia extrapolated from Erikson's work, and this term describes those who have accomplished commitment without experiencing extensive exploration. In such cases, the individual may commit to a particular identity based on the roles prescribed for him or her by social groups. Côté and Levine (2002) wrote that this status may in fact be the de facto status in many societies, particularly non-Western cultures, where Identity Achievement in the strict Eriksonian sense is seldom the norm. Instead, they argue that in non-Western contexts it is "possible that there is 'identity

achievement' within 'identity foreclosure' if the culturally appropriate domains are investigated" (p. 20).

Taken together, these stages present a relevant framework for this research. This study is certainly concerned with those individuals undergoing Moratorium, because their need for identity exploration may lead them to greater levels of online experimentation. Indeed, the use of technologies like social networking sites and online gaming potentially provide a robust platform for trying out various roles that the individual may wish to adopt. However, of particular interest in this research is how those who are closer to Identity Achievement continue to utilize technology.

Presumably, those who have committed to a particular identity may no longer perceive a need to use various communication activities to test out possible identities. In the next section of this document, literature regarding adolescents' use of technology will be addressed as well as possible ways individuals may be performing communication activities by various channels during their developmental process.

## Online Interaction of Young Adults

Kraut et al. (1998) ignited controversy about the impact of the Internet when they found that time online was associated with decreased involvement with family and local social circles, as well as increases in loneliness and depression. They found this effect particularly evident among teenagers, who experienced higher levels of loneliness and greater declines in social support than others in their families who also used the Internet.

The Kraut et al. study was criticized for its methods. Notably, the study involved a group of individuals using a single Internet service provider and did not use a control group of non-Internet users (Gross, Juvonen, & Gable, 2002). Additionally, because the Internet was relatively new in 1998, the novelty of the technology and its lack of social media may have inhibited human interaction. Finally, the study failed to establish whether behavioral differences of "early adopters," who were the primary population analyzed in the study, may have resulted in greater displacement of family and less interaction, both online and face-to-face.

More recent research has reached more positive conclusions about Internet use than those identified by Kraut et al. (Bonetti, Campbell, & Gilmore, 2010; Helsel, 2009). As regards creation of identity online, Williams (2008) provides an analysis of written fluency and argues that the online environment fundamentally changes notions of self-presentation and provides unprecedented opportunities for young people to creatively explore self-expression, especially with regard to the presentation of identity within social networking sites and other online contexts. He writes that while the writing of previous generations was typically directed only to teachers, "students can now compose material that is instantly available to a global audience. What's more students can create and maintain a variety of these texts and personas for a variety of different audiences" (p. 683).

The following sections explore how young people are using online media for interpersonal interaction. In the first section, issues related to one-to-one communication are addressed, including loneliness and relationships, both romantic and platonic. The

second section focuses on the role of online social networking for young people, and in the final section the issue of identity development using online media is explored. Together, these sections are intended to address how young people are currently using mediated communication, and how it enables identity exploration online.

*Interpersonal relationships online*

*Loneliness and online interaction.* Some research has indicated that the Internet can provide opportunities for interaction that may serve to offset some types of social alienation. Such findings are relevant to this study because they indicate that those individuals who are less able to interact in a face-to-face setting may find opportunities for relationship, and ultimately identity exploration, in online communication settings.

A 2002 experimental study of undergraduate college students found that scheduled online chat sessions with anonymous partners were related to significant decreases in loneliness and depression, and increases in perceived social support and self-esteem (Shaw & Gant, 2002). A similar experiment conducted by Amichai-Hamburger, Wainapel, and Fox (2002) found that introverted and neurotic individuals felt they were better able to express their genuine identities in online chat sessions, compared with extroverts and non-neurotic individuals who identified the "real me" in face-to-face interaction.

For those who are socially inhibited, the Internet may also provide a safe avenue for relationship development. McKenna, Green and Gleason (2002) found that individuals who had difficulties with social interaction reported that they were better able to present their

inner selves and form close relationships online. Additionally, they reported that they were subsequently able to transition their online interaction to real world relationships.

More recent research has tended to reaffirm these findings. Matsuba (2006) found that those who reported moderate levels of loneliness tended to seek moderate levels of Internet use, especially chat rooms, to connect with others. Those who reported high levels of loneliness were also more likely to be "pathological" users of the Internet; however, their excessive Internet use tended to be for playing games, sending e-mail, and downloading music, rather than more immediate interpersonal interaction. This may indicate that those with high levels of loneliness were using the Internet to escape their situation, rather than compensating with online interpersonal interaction.

Somewhat similar findings were identified by Pearson, Carmon, Tobola, and Fowler, (2009) who found that individuals who reported social and companionship motives for using their cell phones also reported lower levels of loneliness. Those who reported higher levels of loneliness were more likely to turn to electronic devices for escape and companionship. These findings are consistent with Matsuba's (2006) contention that pathological use of technology for escape, rather than interaction with others, can heighten feelings of loneliness.

Maybe the most compelling and relevant research in this area is a 2010 study of 626 children ages 10 to 16 conducted by Bonetti, Campbell, and Gilmore. Their analysis not only looked at loneliness of these young people, but the types of content that they tended to

share online. They found that children who felt lonelier had a greater tendency to use the Internet to interact with others, and to share personal and intimate information.

This, of course, raises issues related to safety. However, it also indicates that young people use the Internet to fulfill interpersonal needs. The authors wrote that such interactions allow young people to both share personal information with individuals they already know and to develop online relationships that "allow them to fulfill needs of social interactions, self-disclosure, and identity exploration" (Bonetti, Campbell, & Gilmore, 2010, p. 283). Those established relationships, and how they are constituted online, is the focus of the next section of this research.

*Existing relationships online*. Because identity development typically occurs "within a social reality which one understands" (Erikson, 1959, p. 95), the role and accessibility of romantic and platonic relationships is tremendously important. The ability of the Internet to enable those affiliations becomes particularly salient. Blais, Craig, Pepler, and Connolly (2008) analyzed the impact of specific types of Internet use on best friendships and romantic relationships among students 14 to 18 years of age from rural schools across Canada. Their study involved two surveys conducted in March 2001 and May 2002. When controlling for social adjustment variables, the study found that use of instant messaging technology was correlated with increased commitment, trust and communication, as well as intimacy and companionship among in best friendships. At the same time, the use of public chat rooms (i.e., those involving group communication) was related to greater conflict and alienation, and less intimacy and companionship among best friends. Additionally,

increased use of the Internet for entertainment corresponded with lower levels of commitment, and diminished intimacy and trust with best friends.

Additionally, the authors found that romantic relationships benefited from person-to-person technologies and showed negative impacts from the utilization of group- and entertainment-based media. Similar to the findings identified regarding friendship, results indicated that individuals in romantic relationships who used instant messaging reported increased commitment, trust and communication, as well as intimacy and companionship.

On the other hand, online entertainment and games were correlated with decreases in relational commitment. The researchers speculated that online gaming and entertainment may displace the time that young people spend with others. They also noted that the anonymous nature of online chat rooms — which can facilitate hyperpersonal interaction with strangers — may result in intense but ephemeral interactions that can cause jealousy and conflict within existing face-to-face relationships. These parallel findings between platonic and romantic relationships support the notion that online interaction can be useful in so far as it supports the maintenance and development of existing social bonds.

Social networking sites also seem to be a viable mechanism for supporting existing relationships, especially for those who experience high levels of shyness. A 2010 study of 241 U.S. college students found that those who reported high levels of shyness also showed stronger associations between friendship quality and the use of Facebook (Baker and Oswald, 2010). At the same time, Facebook use did not have a negative impact on loneliness. These findings are supported by the research of Desjarlais & Willoughby

(2010), who found that for girls, more frequent use of the Internet to stay connected with friends had a positive impact on relationship quality during the last three years of high school. For boys, a similar improvement was seen for those with high levels of social anxiety.

These findings about the nature of online friendship are particularly relevant since young people tend to look to friends and peers as they experiment with new roles and behaviors online. In doing so, they seek not only approval or disapproval for their choice, but they also tend to look for similarities in the others, as they observe their cohorts (Subrahmanyam & Smahel, 2011).

*Building new relationships online*. The World Internet Project (Annenberg School for Communication, 2007) found that the Internet has indeed become a mechanism for creating online companionship. In the United States, the project found that among teens and adults, the number of individuals who meet new friends online is growing. As of 2007, Internet users reported having met an average of 4.65 online friends whom they have never met face-to-face. Additionally, the project found that on average, Internet users report having 1.6 friends that they met online and later met in person. This is double the number reported when the project began in 2000. In Great Britain, about 20 percent of Internet users have met a new friend online and about half reported later meeting that individual in person (Gennaro & Dutton, 2007).

Addressing the nature of new online relationships, Mesch (2005) evaluated the nature and longevity of relationships that have their genesis online. Using data collected from

Israeli teenagers 13 to 18 years old in 2004, the author found that social connections that originate online tend to be weaker than those that begin in person. However, two factors did play a significant role in determining the strength of such relationships. First, the multiplexity of the relationship was critical to the longevity of the relationship; in other words, online relationships become more personal when intimacy in conversational topics and shared activities develop. Second, the relationship duration is critical as it supports the development of intimacy.

Sheer (2011) found similar results among teenagers in Hong Kong who used Web cameras, instant-messaging, and shared Web pages to post live updates and pictures among classmates at three different public schools. Her findings indicate that the use of rich media, such as web cameras and shared Web pages, tended to increase the number of friends, acquaintances, and opposite sex friends among students who used these services. The ability to *control* messages, which is greater for instant messaging and posting content, was related to the creation of greater closeness in relationships.

Unfortunately, while young people are forming new friendships online, the antecedents to these relationships are not always positive. Wolak, Mitchell and Finkelhor (2003) found that among young people 10- to 17-years-old, highly troubled boys and girls had the highest likelihood of developing close online relationships, as did girls with high levels of conflict with parents and boys with low levels of parental communication. The authors noted that because of the sorts of problems experienced by these young people, vulnerability to online exploitation was high.

The ease of initiating relationships online may be problematic for romantic affiliations as well. Among those seeking online romance, the ability to intensively screen potential paramours using advanced online search features can lead to poor decision-making and lower relational quality. This occurs because the search process reduces the cognitive resources and critical thinking skills of those who are looking for love, and "they may be less likely to ignore irrelevant information and more likely to be distracted by or attracted to attributes that are not pertinent to their original preferences" (Yang & Chiou, 2010, p. 209).

The preceding research indicates that online relationship creation is common among younger adolescents; however, Matsuba (2006) found that most of the college-age participants in his research were not seeking new relationships online, which he notes may be attributable to concerns about personal safety. It is notable that much of the research identified and cited in this portion of the review of literature focuses on relationship development among elementary and high school adolescents. This indicates, perhaps, that the connections established at a younger age build social networks within which identity development occurs. This is consistent with understanding that networks of friends are particularly important because "adolescents may be more likely to try out new attitudes and behaviors in their company" (Subrahmanyam & Smahel, 2011, p. 61). Online social networking, which constitutes one of the primary mechanisms for online management of existing friendships, is the focus on the next section of this research.

*The impact of social networking*

Social networking has also grown rapidly in recent years, with sites like Facebook attracting nearly 500 million members worldwide since its launch in 2004 (McCarthy, 2010). Part of the attraction of sites like Facebook is their ability to enable social interaction and to allow young people to connect with far more friends and acquaintances than they might otherwise encounter on a daily basis. In this author's experience, it is not unusual for the average college student to have hundreds of individuals listed as "friends" on these Web sites. Lehrer (2009) found that individuals with a large number of "friends" on social networking sites might not have significantly more close friends; however, they do tend to maintain more connections to individuals who are acquaintances. The consequence of this finding is that young people on social networking sites have access to a larger community within which to function and to present their identities.

This has implications on several levels. First, online social networks have the potential to reconnect people who have lost touch with one another or who are not currently interacting socially. For example, Facebook users are typically identified by high school or college, and by graduation year; consequently, identifying classmates is one of the typical connection mechanisms that participants use. Additionally, groups exist for numerous camps, programs, clubs and other activities, making it easy to reconnect with childhood friends and acquaintances (Ellison, Steinfield, & Lampe, 2007; Skeels & Grudin, 2009).

This issue of how online relationships function is complicated by the question of what constitutes friendship or even interaction. Does simply being virtually connected

constitute a useful social interaction that leads to identity development in adolescents? Online environments provide various forms of virtual voyeurism that are unequaled in the face-to-face setting. Individuals who are active on social networking sites have access to a continuous and dynamic dais for the presentation of self and the observation of others through the posting of photos, videos and personal information, as well as news items, articles and Web sites of interest.

Additionally, users of online technologies such as Facebook, MySpace, and Twitter often post brief, ongoing narratives about their lives. Once posted, an individual's online "friends" can, and do, post responses to these disclosures. Such messages are likely to provide the illusion of copresence, even if they do not include the non-verbal feedback or immediacy that are endemic to face-to-face human interaction. This ongoing flow of information is further facilitated by the fact that many mobile technologies provide a continuous awareness of the words and actions of one's cohorts.

The dominant site for social interaction among young people is Facebook, which currently boasts almost 500 million members (McCarthy, 2010). In June 2008, MySpace, a competing site with 114.6 million members, was overtaken by Facebook, which boasted 123.9 million users at the time. Although these services were started one year apart (2003 and 2004, respectively) the growth of Facebook is all the more impressive because it was limited to college students until September 2006. Additionally, while the user base for MySpace grew 5 percent between May 2007 and May 2008, Facebook grew 162 percent during the same period (Musgrove, 2008). In this regard, Facebook demonstrates the

enormous growth of online communication in recent years and its potential to influence human communication, especially among young people who make up the largest portion of its user base.

In spite of concerns that online interaction may lead to exploitation of young people, Stern and Taylor (2007) found that few college-age Facebook users experienced stalking, had received unwanted messages, or had felt that use of the site presented an uninvited invasion of their privacy. From this, the authors argue that Facebook and potentially other online communication media provide a relatively safe and comfortable mechanism for building social connections among college students by reducing uncertainty reduction.

Facebook is generally geared toward interaction with existing friends. Individuals who use the site can send other members a "friend request," which must be approved by the recipient before personal information can be accessed. However, even before sending such an invitation, users can typically see a list of each other's current friends. This functionality provides easy access to mutual friends and allows users to quickly identify others in their existing social circle. As such, Facebook primarily facilitates what Putnam and Feldstein (2003) refer to as bonding social capital, which involves building stronger relationships within the existing social sphere. The authors contrast this with bridging social capital, which focuses on the creation of new relationships beyond the boundaries of the individual's social group.

At the same time, Facebook does allow users to create groups based on shared interests or experiences. Since membership in these groups is generally visible to others,

the potential to develop extended communities beyond existing social groups is enhanced. The development of such groups can be rapid and dynamic. This raises a number of questions regarding the nature of online relationships. Zhao, Grasmuck, and Martin (2008) note that while students previously used online communities anonymously, the rise of social networking sites such as Facebook require them to present a public identity that is based on group and consumer identities, rather than personal narrative. Understanding such constructions of identity may have an impact on the development processes of young people.

*Online identity exploration*

The growth of the Internet and its popularity as a tool for social interaction raises the question of whether these adolescents are able to achieve the same sense of identity from online relationships that they do from face-to-face communication. Online connections to peers can provide more opportunities and means for identity exploration. At the same time, such interaction may be more superficial. Padilla-Walker, Nelson, Carroll, and Jensen (2010) have even suggested that the use of certain interactive video games may result in experimentation and ultimately adoption of more violent identities. On the other hand, it is not uncommon for identity development *in any setting* to involve a great deal of rebelliousness and risk-taking (Bukobza, 2009).

For many young people, use of the Internet for social interaction provides a primary mechanism not only for utilitarian communication, but also for the presentation of self and surveillance of the actions and activities of others. Siibak (2010) found that young people

tend to consciously use social networking sites for identity 'performances' and impression management, and that these performances were influenced by popular constructions of identity. Stern (2007) wrote that the online environment provides remarkable opportunities for identity exploration that may not be as easy to accomplish in the face-to-face setting. She wrote that as adolescents "consider if and how they will draft themselves into existence online, they are forced to reflect on who they are and how they wish to be viewed by others" (p. 24).

And while online identity experimentation may certainly be accomplished through the rich media environments of gaming and social networking sites, it need not be limited to those highly visual settings. Tian (2010) found self-presentation and identity exploration to be among the motives of those who regularly published online blogs. This was particularly true for those who experienced high levels of self-consciousness in public. For these individuals, self-presentation was a primary motivator in their online writing efforts. Mazur & Kozarian (2010) identified similar motivations in their analysis of 124 blogs produced by 15- to 19-year olds. The researchers' analysis of the content posted by these young people concluded that blogs "are less about direct interaction with others than about careful self-presentation" (p. 124).

Such experimentation is particularly evident in online settings that provide a safe and controlled space within which to manage that presentation (Huffaker & Calvert, 2005; Schmitt, Dayanim, & Matthias, 2008; Valkenburg & Peter, 2008; Valkenburg, Schouten, & Peter, 2005). O'Brien (2000) alluded to this in noting that managed presentation of

alternate identities does indeed occur online and that it seems to be more apparent in young adults who use the Internet. He described a distinction between older individuals who seek to ensure symmetry between their online and offline selves, and younger people who see online interaction as an opportunity to step beyond the bounds of a single construction of self and experiment with different personae. O'Brien wrote:

> There does appear to be a strain between those users who conceive of cyberspace as a realm in which one is invited to "perform" a variety of alternative realities and those for whom the advantage of electronic communications is the transcendence of the time/physical space as a barrier to a range of personal networks. For the latter, one's intent is to remain "intact" as a "real person." Online communications are simply a means to extend the range that this self can travel to meet others. In the former, it is one's performative abilities that count; one's prowess as a choreographer of alternative realities. (p. 93)

This performative behavior seems to be more evident among those who have not yet reached identity commitment (Marcia, 1966). Matsuba (2006) found that among college students lack of clarity in self-concept was correlated with greater use of the Internet for entertainment activities and decreased motivation for relational communication, as evidenced by more frequent online interaction with strangers and the use of pseudonyms in those exchanges. Additionally, he found that those who were in the Moratorium stage of identity development tended to report more excessive Internet use. He concluded that "the Internet may be a critical tool in aiding youth to explore different roles in their struggle to

find an adult identity" (p. 283).

Valkenburg and Peter's (2008) research indicates that use of the Internet can provide a valuable social grounding even before identity development begins in earnest. Their study of 1,158 Dutch students ages 10 to 17 found that subjects who used the Internet for identity exploration more often communicated online with people of different ages and cultural backgrounds. This behavior also had a positive impact on subjects' social competence. Such activities did not affect identity consolidation; however, this is not surprising since recent research (Arnett, 2006; Côté, 2006) indicates that commitment to identity tends to occur in the late teens and early 20s, rather than early adolescence. In particular, Valkenburg and Peter noted that lonely adolescents used the Internet to experiment with their identity, but that such experimentation tended to significantly improve their social competence.

Such findings certainly support the notion that identity exploration can occur online. Indeed, Valkenburg, Schouten, and Peter (2005) found that such experimentation is common. Their study of 9- to 18-year-olds found that 50% of those who used live Internet chat activities were deliberately experimenting online with their identities. Among the most important motives for this experimentation were self-exploration (investigating how others react), social compensation (overcoming shyness), and social facilitation (relationship formation).

Hogan (2010) adds another facet to this notion of online identity experimentation by distinguishing between different temporal and spatial dimensions of online identity

experimentation. Using a dramaturgical approach, he argues that online disclosure can be divided into *exhibition* and *performance*. The former embodies the individual's presentation of self through the use of artifacts, with the exhibitor acting as a curator who manages the content. This is in contrast to online performance, which is more time-bound in the sense that it anticipates a specific audience at a specific time. Hogan wrote, "One of the key distinctions between exhibitions and performances is that performances are subject to continual observation and self-monitoring as the means for impression management, whereas exhibitions are subject to selective contributions" (p. 384).

Taken together, these studies underscore the fact that young people do use the Internet for identity exploration purposes. In particular, those who are less advanced in the identity exploration process gravitate toward online activities that allow them to experiment with various definitions of themselves (Matsuba, 2006; Valkenburg & Peter, 2005). Gross (2004) found that such experimentation tends to be more mischievous, rather than exploratory, in earlier adolescence, but that it is indeed common. What specific technologies students use and how it relates to their identity status is a question that seems to be largely absent from the research. The following section addresses how this study seeks to quantify the relationship between various communication media and identity status.

## Purpose and Research Questions

A great deal has been written in recent years about the use of social networking sites and other interactive communication technologies, and their impact on young people

(Mesch & Beker, 2010; Mehdizadeh, 2010; Christofides, Muise, & Desmarais, 2009; Greenhow & Robelia, 2009); however, little research has addressed how specific communication activities relates to the psychosocial identity development process (Barker, 2008).

Much of the research in this area has treated online communication as monolithic. In fact, young people have access to a variety of electronically mediated communication technologies. Some only use only the written word, such as instant messaging; others provide richer interaction, such as video chatting. Some types anticipate immediate feedback from the recipient, such as computer-based instant messaging; others, such as e-mail, allow time for individuals to ruminate on a message before sending it. Some, such as blog posts, are intended for large audiences; others, such as cellular phone calls, are exclusively interpersonal. Some provide a forum for interpersonal disclosure intended to remain in place over time, such as Facebook profiles; others, such as online gaming, are ephemeral and experiential.

Even within the same technological system it is now possible to engage in multiple communication activities. For example, Facebook allows users to "broadcast" personal profiles that endure for months or years, but it also provides instant messaging capabilities that allow immediate dialogue with friends.

Research indicates that young people intentionally choose media to achieve personal and psychosocial goals (Harwood, 1997). The implication of this finding is that young people's identity development status will be evident in their choice of communication

activities. This raises significant questions about causality. Does the type of communication an individual uses predispose him or her toward certain levels of identity development, or does the identity status of specific individuals lead to the use of certain technologies? In spite of the challenge of answering questions such questions regarding causality, analysis of the relationships between preferences toward certain behaviors and identity development status are likely to exist.

Analysis of online behavior also adds an additional level of complexity to the problem of causality. In addition to the interaction effects of personality and communication environment, the rapid rise of interactive technologies and the enormous amount of information they provide within academic, work and social settings may coerce individuals to use certain technologies simply to avoid exclusion. This raises the question of whether young people interact with one another in a particular manner because they choose to, or because the culture requires them to use these channels in order to function. For example, a student may eschew e-mail entirely, but is required to use that technology because he or she needs to interact with an employer, an instructor, or a student group at college.

Because of the lack of research in this specific area, and because the causal direction of psychosocial characteristics and behavior (e.g., technology use) are generally difficult to clearly identify (van den Eijnden et al., 2008), this research is necessarily exploratory and thus employs research questions rather than hypotheses.

The intent of this study was to address what types of technologies are young people

using at various stages in the development process. Consequently, this research addressed questions related to manifest behavior of adolescents, namely "What technologies do young people use and report as important as they progress through the identity consolidation process?" This inquiry is important because it is a necessary precursor to addressing more latent psychosocial questions such as, "What are young people hoping to achieve in using specific communication technologies?"

As a result, four primary research questions were addressed in this study. The first two questions addressed the relationships between various communication types as they related to identity development. Research in this area could focus very narrowly on specific communication activities, or it could treat communication technologies as monolithic. Neither of these approaches informs this field of study well until the relationships between the various communication activities are better understood. Consequently, this research took a grounded approach, allowing the relationships between communication technologies to arise from the behavioral and attitudinal reports of students themselves. Therefore, the first two research questions addressed what patterns of use and value exist among the communication activities used by young people, and how those preferences might be related to identity development. These questions were addressed through both exploratory and confirmatory factor analysis.

The third research question proposed for this dissertation related to the perceived importance of various communication activities to interact with others. The intent of this question was to determine whether the importance an individual attached to certain

communication activities was predictive of his or her identity development status. This question focused on importance, rather than frequency of use, in order to control for the varying time required to interact with different technologies. For example, as noted previously, text messages from a cell phone may be sent repeatedly during the day; posting photos or updating a Facebook profile may only occur weekly. However, a young person may consider the former far less important than the latter. Additionally, this question controlled for utilitarian interactions that may occur more frequently because of employment or schoolwork, but are viewed by the subject as far less important to social interaction.

The fourth question addressed the frequency of use of various communication activities and their relationship to identity development. The intent of this question was to determine whether the communication activities employed are predictive of the user's the identity development process. It is possible that a young person who engages in more online identity experimentation may do so as a result of his or her identity development status. Alternatively, an individual who presents a specific identity online may do so as a result of his or her commitment to a particular identity. The multiple characteristics (immediacy, richness) of online communication technologies predispose them to certain outcomes. Determining which of these forms young people preferred at different stages of the identity consolidation process was the focus of this question.

Ultimately, these questions were intended to address the patterns of how young people preferred to interact using mediated communication. This was a fundamentally

different question than what *motivates* them to choose particular communication activities, since most young people would not indicate that their behavior was intended to advance their identity development; however, understanding what communicative behavior is occurring — and what is not — are fundamental questions that must be asked before questions of intention and agency can be appropriately addressed.

One of the significant challenges of this study was addressing not simply the use of various communication channels. Indeed, it is easy enough to use automated methods to quantify specific behaviors such as using a telephone or visiting a specific Web site. The difficulty was that various communication media can be used for multiple purposes. For example, many of the cell phones that are currently available can be used to make calls, send e-mail, send text messages, visit Web sites, broadcast short status updates or comments to peers, or even interact via video.

Consequently, this research sought to identify the related types of media use, not simply what Web sites or devices students use. The task of identifying communication behaviors needs to be ipsative in nature; therefore, this inquiry focused on the behavior of young people, not from the commercially or technically defined channels of communication. In order to accomplish this analysis, the present research began by ascertaining whether patterns of use for identity development exist across various mediated communication behaviors. Therefore, identifying any potential relationships between specific communication activities, and collapsing those into related types of use, was an important focus in this research. After dimension reduction was accomplished and

evaluated, the final phase of this research addressed how the identified types of communication behaviors related to identity development status.

*Research questions*

The research questions addressed in this study were as follows:

RQ1: What commonalities exist in across the importance that adolescents attach to certain communication activities that would indicate preferences for the use of certain communicative behaviors for identity exploration?

RQ2: What commonalities exist across the frequency of communication activities reported by adolescents that would indicate preferences for the use of certain communicative behaviors for identity exploration?

RQ3: How is the identity development status of adolescents related to the importance they attach to the various communication activities they use?

RQ4: How is the identity development status of adolescents related to the frequency with which they engage in various communication activities?

# CHAPTER THREE. METHOD

## Participants

Participants for this study were new college students beginning their first year at a mid-size university in the Midwest region of the United States. Students from this population were chosen because most are approximately 18 years old, placing them near the end of adolescence (Sebald, 1968) and within the period of emerging adulthood when "identity explorations become more prominent and serious" (Arnett, 2007, p. 24). During this time, these individuals are preparing to leave home on an extended basis for the first time and are experiencing the period of moratorium when social norms not only allow them, but expect them, to explore identities for themselves (Erikson & Erikson, 1997). This population was specifically chosen because they are at a phase in life when the identity development process is most pronounced and active.

## Data Collection Procedures

Data were collected from new students who moved into the university residence halls in August 2009. Resident assistants distributed and collected the survey instrument for this study during "floor meetings" held for incoming students during the orientation period before classes began. Because these resident assistants frequently conducted other evaluation and demographic measurements used by the university, they had already received basic survey administration training and IRB-mandated instruction related to ethical research procedures. In compliance with IRB requirements, the cover page of the

survey included a statement of informed consent, which was referred to by the individuals administering the survey.

For the purposes of this research, residence hall staff conducted a total of 628 surveys with first-year students who had recently moved into the residence halls. Six surveys were returned uncompleted with notations that the subjects were not new college students; these surveys were discarded. One survey respondent indicated that he or she was only 14 years old. Because the criteria for participation required respondents to be 18 or older, this survey was not analyzed. This process resulted in a total of 621 usable surveys.

Of the students who indicated their age, all were between 18 and 22, except one who listed her age as 28 and one who listed his age as 65. Because the focus of this study was limited to individuals in adolescence and emerging adulthood, which ends by the mid 20s (Arnett, 2007), neither of these surveys was included in the analysis. Twelve surveys were returned blank and were excluded from the data, leaving a total of 607 completed surveys that were analyzed for this research.

Of the 599 respondents who indicated their age on the survey, 487 (80.2%) were 18 years old, 107 (17.6%) were 19 years old, three (0.5%) were 20 years old, and there was one (0.2%) each who reported that they were 21 and 22 years of age. The median age of respondents was 18.2 years (SD = .45). Of the respondents who indicated their biological sex, 300 (49.4%) were female and 304 (50.1%) were male; 3 (0.5%) did not indicate biological sex.

Nine respondents (1.5%) did not indicate the ethnic group with which they primarily identified themselves. The remaining 598 indicated the following: 13 (2.1%) were African American; four (0.7%) were American Indian; 16 (2.6%) were Asian; one (0.2%) was Hispanic; 557 (91.8%) indicated that they were White; and seven (1.2%) selected "other" in response to this question.

When asked about the size of the communities where they lived before coming to the university, 8 (1.3%) did not respond, 319 (52.6%) chose "rural area or small town," 246 (40.5%) chose "larger town or suburban area," and 34 (5.6%) selected "a metropolitan area." The pool of subjects for this study included occupants of 10 different residence halls on the university's main campus.

To ensure that the population of students taking this survey were reasonably fluent in using communication technology, subjects were asked to indicate their "level of comfort using technology (e.g., the Internet, computers)." Six students (1%) did not answer this question. Of the 601 students who responded, 285 (47%) noted that they were "very comfortable" with technology use, 226 (37.2%) indicated that they were "comfortable," 73 (12%) indicated "neutral," 11 (1.8%) indicated that they were "uncomfortable," and six (1%) indicated that they were "very uncomfortable."

## Measures

### *Frequency and importance of Internet use*

A significant number of studies have addressed Internet use as monolithic by combining various communication activities into single variables. Selfhout, Branje,

Delsing, ter Bogt, and Meeus (2009) addressed the link between anxiety and depression, and Internet use simply by asking about time and frequency "surfing" for information versus time and frequency of instant-messaging. This raises the question of whether such simple measures can adequately address the complexities and nuances of online communication.

In spite of these approaches to the Internet as a single communication channel, a number of studies (Kaynar & Amichai-Hamburger, 2008; Livingstone, Bober, & Helsper, 2005) have found that different levels of interactivity available using different Internet protocols do indeed engender different levels of involvement and forms of social interaction. Moreover, studies addressing issues of richness of online communication modalities and their individual abilities to convey certain types of information do indeed indicate that different communication protocols are better able to facilitate different types of interpersonal interaction (Holladay & Seipke, 2007; Rice, 1993; Rice & Shook, 1990; Rogers & Lea, 2005).

A variety of scales have been developed to measure Internet use; however, many of these are inappropriate for this study for a variety of reasons. For example, the Computer and Internet Use Questionnaire (CIUQ) developed by Mullis, Mullis, and Cornille (2007) presented subjects with three types of Internet and computer uses — school-work, information seeking, and communication — and asked them to estimate the percentage of time used for each item so that they totaled 100%. This approach fails to consider that online activities such as chatting or downloading music can be performed simultaneously,

and that many such behaviors can occur concurrently with real-world activities. Additionally, instruments such as the CIUQ also fail to consider the rapidly changing nature of technology. By using terms such as *computer* and *Internet*, such instruments ostensibly exclude other digitally mediated interaction that occurs via cell phones, tablet devices such as the Apple iPad, and online gaming consoles.

To address these deficiencies, this study sought to analyze a more representative sample of the types of electronically mediated interaction that were actually occurring. To accomplish this, a list of Internet uses was developed beginning with the Pew Internet and American Life Project's (2009) research studies conducted between March 2000 and December 2008. (See Appendix A.) This list was shortened by excluding all online activities (e.g., making online purchases, looking up phone numbers) that did not involve intentional interpersonal interaction. Additional online communication activities were added to the list based on this author's experience as an information technology professional.

The researcher supplemented these through informal discussions with employees in the technology department at the university where this study was conducted. Specifically, employees involved in providing direct assistance to technology users were asked to describe the technology uses they were aware of or assisted with in the course of their work. Also added to the list were face-to-face communication, and voice calls either via a cellular phone or a traditional wired telephone. The inclusion of these two communication activities was deliberate. First, they complement the other 16 communication activities in

presenting most of the dominant forms of interaction available to young people. These two items were included to ensure that those who preferred more organic, less technologically oriented communication activities could indicate those preferences on the survey. Second, preferences toward specific media are based within the larger communicative environment within which individuals function. Studying decontextualized communication activities can be problematic because it fails to consider how individuals meet interactional needs in various ways (Jensen, 2011; Walther et al., 2010). This approach ensured that the "context of [the] choice" (Sniderman & Grob, 1996, p. 377) presented in the survey included virtually all communication options. In short, including face-to-face and voice in the survey kept subjects aware of all their communication behaviors as they completed the survey.

The list was further refined by clarifying the individual's level of participation in the online activity. Among the distinctions added were the difference between sending and receiving various types of messages, creating original content versus responding to existing messages, and participation in live interactive activities such as playing games or "chatting" with others versus asynchronous activities that allowed greater control over presentation of information, and purposive versus social activates in online virtual environments (Wagner & Rachael, 2009). Finally, several variations to questions were added to clarify whether subjects were interacting primarily with strangers or individuals they knew in a face-to-face setting. This distinction was added because research indicates that the nature of electronically mediated communication can vary depending on current

and anticipated relationships between the participants (Bonetti, Campbell, & Gilmore, 2010; Ramirez, 2007). Appendix A provides a complete list of the activities from Pew Internet, and how they were mapped to the questions used in the survey.

To overcome the concurrent and always-on nature of many online technologies, subjects were asked to indicate how frequently they used a particular communication activity "compared to other means of communicating." Subjects were asked to rank their frequency of use on a scale of one to five, with one being "much less frequently" and five being "much more frequently." The option "I do not use this" was also offered for each communication activity, which was coded as zero in the final data.

Questions were also formulated to address the subjects' perceived importance of the communication activities addressed in this study. This distinction is critical because some communication techno require very little time to use, and thus their frequency of use may be underreported, even though they are considered essential mechanisms for interpersonal interaction. For example, a message that is "broadcast" to others via Twitter is unformatted text that is limited to 140 characters in length (Hogge, 2008); text messages sent via a cell phone are limited to 160 characters (Milian, 2009). In spite of the brevity of these messages, individuals between 18 and 24 in the United States who owned cellular phones capable of sending text-messages sent an average of 790 such messages each month (Nielsen Company, 2008) during the second quarter of 2008. This indicates that young people seem to rely on this technology heavily, in spite of the ephemeral nature of the messages.

Because such messages are necessarily short but are used often, the reported frequency of use for these communication activities may not reflect actual utilization. Therefore, in addition to asking subjects to report *frequency* of utilization, the survey asked respondents to "indicate how important you feel it [the communication activity] has been to interact with others or share information" on a scale of one to five, with one being "much less important" and five being "much more important." For this group of questions, subjects were once again given the option to choose "I do not use this," and those responses were coded as zero in the data.

Finally, because the subjects of this study were in their first few weeks at college, it was anticipated that the new setting might have temporarily impacted their technology use. For example, some may not have configured Internet access in their dorm rooms, they may have been outside the calling area for their cell phone provider, or they might not have the same technology access they were accustomed to at home. Therefore, on the questions regarding frequency and importance of various communication activities, subjects were asked to refer to their interaction before they came to the university. The intent of this qualification is to focus on regular patterns of behavior, which may be more likely to reflect individual communication preferences.

*Identity development*

A variety of instruments are available to measure ego identity. The Identity Style Inventory (Berzonsky, 1989; Berzonsky & Neimeyer, 1994; Crocetti, Rubini, Berzonsky, & Meeus, 2009) was an instrument intended to quantify identity development in terms of

personal-problem solving and decision-making. Because it primarily addressed style of interaction rather than directly addressing the identity development process, it was not appropriate for this research.

Marcia's (1987) identity development status measurement instrument is beyond the scope of this research because it requires an extensive interview format and clinical training for instrument administrators. Because of the extensive resources required for administration, Marcia's instrument does not lend itself to measuring trends in a larger population, which is the intent of this research.

The Ego Identity Process Questionnaire (EIPQ) developed by Balistreri, Busch-Rossnagel, and Geisinger (1995) was also considered for use in this research. It is a 32-item instrument that offered a manageable size and mechanism for administration, but the results it provided were segmented into a number of areas including occupation, family, religion, relationship, dating, and others. Additionally, the instrument addressed Marcia's (1966) definition of identity exploration and commitment, rather than Erikson's (1950) notion of Identity Achievement. Consequently, this measure was not used.

For this study, the Erikson Psychosocial Stage Inventory (Appendix B) developed by Rosenthal, Gurney, and Moore (1981) was used to measure the level of identity development that young people had achieved at the time the survey for this research was administered. This scale has been used successfully in developmental research (e.g., Gray, Ipsa, & Thornburg, 1986; Njus & Johnson, 2008) and shown to have convergent validity with other personality measures and Eriksonian scales (Schwartz, Zamboanga, Wang, &

Olthuis, 2009), as well as high levels of internal consistency and construct validity (Leidy & Darling-Fisher, 1995). The full instrument uses 72 items, with 12 items representing each of the following six factors of Erikson's psychosocial stages: trust, autonomy, initiative, industry, identity, and intimacy. The identity scale is of particular interest for this study, but to ensure adequate topical diversity among the statements the autonomy and intimacy scales were included as well.

Several statements in the original version of this instrument were not clear and were therefore replaced with statements proposed by other researchers. Rosenthal et al. (1981), who developed the EPSI, originally identified the statement "I can stand on my own two feet" as confusing for some subjects who may have taken it literally. Consequently, it was replaced with the following statement suggested by Arehart and Smith (1990): "I can take care of myself." Additional revisions suggested by the same researchers were also incorporated into the survey for this research. These included replacing the statement "I don't really know what I'm on about" with "I don't really know where I'm headed in life."

To complete this survey, respondents were asked to indicate how true each declarative statement is about them, on a scale from 1 ("hardly ever true") to 5 ("almost always true"). Scores for the identity measure were the mean of responses to the 12 questions, and are therefore continuous data ranging from 1 to 5.

## Data Analysis

The focus of this study was the relationship between the identity development status of young people as it relates to their preferred forms of communication. Because the

communication activities of young people were likely to change as they sought different outcomes from their interpersonal interactions, questions were asked in the survey conducted for this study that focused on their perceptions of communicative behavior: how *important* did they consider these communication activities and how *frequently* these activities were used "to interact with others or share information." Presumably, as students sought specific outcomes from their interaction, certain types of communication might be viewed as more important or more efficacious.

Initially, descriptive statistics were analyzed to determine the importance and frequency of use of various communication activities. Correlations were then examined between the communication activities, and between the activities and EPSI identity subscale scores to determine which activities demonstrated similar importance and use patterns, and which activities were related to identity development.

To further explore relationships between the various activities addressed in this research, factor analysis was selected for several reasons. First, since a theory-based relationship is assumed to exist between the motivations and needs of young people and their choice of communication channels, factor analysis was selected rather than principal components analysis (Iacobucci, 2001). Factor analysis was also chosen because of its ability to delineate the latent constructs behind the communication choices of young people (Conway & Huffcutt, 2003; Widaman, 1993). Little research has been done to address how outcomes sought are connected to the preference toward *specific* communicative activities; therefore, factor analysis was employed to evaluate whether commonalities connected

certain communication activities for the purposes of identity exploration. Finally, the large number of communication activities addressed in this study poses a daunting challenge to developing a clear outcome model. Therefore, factor analysis allowed the reduction of the large group of communication activities addressed in this research to manageable composite scores to analyze relationships to identity development.

Massy (1965) wrote that exploratory studies are challenging "when well-defined models or reasonably clear hypotheses dealing with interrelations between variables is lacking" (p. 234). He suggests pairing a principal component-based method with regression analysis to address the challenges of relatively new fields of inquiry. This process involves identifying key components in a large data set, and then using regression analysis to evaluate those components with regard to an additional construct. This approach was used for this research because it provided a mechanism for data reduction as well as a method for connecting the components to identity development measures.

Therefore, to accomplish this research, the importance of communication activities data and the frequency-of-use of communication activities data were separately subjected to exploratory factor analysis. The validity of both two-factor solutions identified was then verified using confirmatory factor analysis to compare the empirically based two-factor models with a single-factor solution. There were several reasons for this approach. First, since the study was exploratory and used research questions rather than hypothesis, there was no axiomatic expectation for the results; however, it is notable that the results of the exploratory factor analyses were largely compatible with existing theory and illuminated

the findings of earlier research. Moreover, the results of the exploratory factor analysis were largely supported by the confirmatory factor analysis.

Although the validity of the EPSI scale has been previously established (Leidy & Darling-Fisher, 1995; Schwartz, Zamboanga, Wang, & Olthuis, 2009), the EPSI identity subscale was also subjected to confirmatory factor analysis. Because three of the EPSI subscales (identity, intimacy, autonomy) were included in the survey used for this research, a three-factor solution was initially evaluated to determine the divergent validity of the subscales. Ultimately, intimacy and autonomy data were excluded from the analysis due to cross-loading, and a single-factor model of the identity scale was evaluated.

Factor scores for the factors identified for importance of use and frequency of use were evaluated using regression analysis to identify any potential relationships to the EPSI identity subscale scores. Similar analyses were performed for the individual communication activities that constituted each factor, as well as for individual communication activities found to be correlated with the EPSI identity subscale scores.

# CHAPTER FOUR. RESULTS

Several tests of statistical significance were used to determine whether there were differences between the demographic groups represented in this study. Several independent-sample t-tests were performed to evaluate differences by biological sex. No statistically significant differences were found for scores on the EPSI identity subscale, $t(2) = 1.70, p = .09$, for males and females. The mean score on this instrument was 3.84 ($SD$ = .60) for males, and 3.75 ($SD$ = .60) for females. There were also no significant differences between males ($M = 2.02, SD = .69$), and females ($M = 2.01, SD = .62$) for the mean scores related to the frequency of communication activities, $t(2) = .12, p = .90$. There were statistically significant differences between mean scores of the two groups for overall importance of communication activities, $t(2) = -2.83, p < .01$, with females reporting higher levels of importance for all items listed in the survey ($M = 2.53, SD = .60$) than males ($M = 2.29, SD = .62$).

In order to determine whether ethnicity had an influence on these results, it was necessary to consolidate the data. Because the subjects used for this study were predominantly White (91.8%), the members of the other ethnic groups were analyzed together in order to achieve a meaningful sample size for comparison. The multi-ethnic group comprised the following: 13 African Americans, four American Indians; 16 Asians; one Hispanic, and seven who indicated that their ethnic group was "other."

There were no statistically significant differences between the multi-ethnic group and the White group, $t(2) = .85, p = .40$, for scores on the EPSI identity subscale. Mean scores

were 3.72 ($SD$ = .57) for the multi-ethnic group and 3.80 ($SD$ = .61) for the White group. There were significant differences between ethnic groups for both importance and frequency of communication activities. For importance-of-use variables, $t(2) = -3.79, p < .001$, the mean score was higher for members of the multi-ethnic group ($M = 2.97, SD = .90$) than it was for White group ($M = 2.35, SD = .58$). For frequency-of-use scores, $t(2) = 3.22, p = .001$), the multi-ethnic group also had higher mean scores ($M = 2.33, SD = .77$) than the White group ($M = 2.00, SD = .64$). Together, these findings would indicate that members of the multi-ethnic group reported more frequent participation in the communication activities addressed in this study, and assigned greater importance to those communication activities.

Finally, the university where this research was conducted had a significant number of students from rural areas. Therefore, consideration was given to how the size of the subjects' hometowns may have impacted their use or reported importance of online activities. The primary consideration was whether individuals from more rural areas may have had less access to electronically mediated communication. This concern was not related to the sophistication of rural populations, but rather to the fact that one factor responsible for the "digital divide" between technology users and non-users is limited availability of Internet access in rural areas (Priegera & Hub, 2008).

The mean scores for importance of use and frequency of use were compared across the three different hometown sizes reported by subjects as "a rural area or small town," "a larger town or suburban area," or "a metropolitan area." One-way ANOVA was used for

this purpose and no significant difference was found related to community size with regard to importance of communication, $F(2, 592) = .38, p = .68$, or frequency of communication $F(2, 596) = .716, p = .48$.

## Descriptive Statistics

### *Importance of communication activities*

Descriptive statistics were examined for the importance that subjects attached to communication activities. One of the options on the survey for each communication activity was "I do not use this." Therefore, means and standard deviations were evaluated both for all subjects and for those who attached some level of importance to the communication activities addressed in the survey (i.e. those who did not choose "I do not use this"). Means, standard deviations and sample sizes are provide in Table 1.

All 603 of the subjects who responded to the question about face-to-face communication assigned some importance to that activity. Among all of the communication activities, it was ranked as most important and had the lowest standard deviation, $M = 4.25, SD = .86$. These results indicate that in spite of the widespread availability of electronically mediated communication channels, young people still prefer direct human interaction.

The second most important means of communication for all subjects and for those who used the communication activity was voice calling, either from a cellular or traditional wired telephone. The mean for this activity was 3.35 for users ($SD = .89$) and all subjects ($SD = .90$) alike. What is notable is the rather large drop in the mean between importance,

between face-to-face communication and voice calls. The mean difference in importance between these two activities is .90. Since the data for this research were collected on a five-point Likert-type scale, this indicates the drop of almost one full point or 18% of the full rating scale. Given the widespread use of cell phones in recent years, this difference is remarkable.

The third most important communication form for all subjects ($M = 3.21$, $SD = 1.16$) and users ($M = 3.26$, $SD = 1.00$) alike was text messaging from a cellular phone. This is consistent with statistics cited earlier showing young people rely heavily on cell phone text messaging (Nielsen Company, 2008).

The communication activity ranked fourth for importance was e-mail for all subjects ($M = 2.81$, $SD = 1.16$) and for users ($M = 2.90$, $SD = 1.00$). Although e-mail is certainly an Internet-based technology, it was the earliest online technology to gain widespread use (Baron, 1998), becoming ubiquitous in homes and businesses by the mid- to late-1990s. Consequently, it is a well-established medium that may be just as important for young people's work and school activities as it is for purely social interaction (Lenhart, 2010).

The fifth most important activity for users and for all subjects was live chat from within a social networking site (all subjects: $M = 2.42$, $SD = 1.25$; users: $M = 2.59$, $SD = 1.11$). This activity occurs specifically within a social networking site and requires that both participants be logged in at the same time.

These first five items are distinct for several reasons. First, among subjects who used the various communication activities addressed in this research, the mean for all

communication activities was 2.51. Therefore, these five items represent all of the communication activities that are above the mean in importance for users; the other 13 items are all below average in importance among users of those communication forms. These items are also more utilitarian than primarily social activities like updating a social networking profile or entertainment activities like online gaming. These five types of communication are certainly used socially, but they are the five communication forms that are more likely to be used for everyday tasks and to facilitate routine activities.

The next four items in importance are all communication activities performed on a social networking site: viewing other's profiles on a social networking site (all subjects: $M = 2.36$, $SD = 1.17$; users: $M = 2.46$, $SD = 1.11$), posting personal updates on a social networking site (all subjects: $M = 2.26$, $SD = 1.23$; users: $M = 2.41$, $SD = 1.12$), updating a personal profile on a social networking site (all subjects: $M = 2.24$, $SD = 1.17$; users: $M = 2.34$, $SD = 1.09$), and sharing content such as pictures, articles, or jokes on a social networking site (all subjects: $M = 2.19$, $SD = 1.20$; users: $M = 2.35$, $SD = 1.08$).

It is notable that all four of these activities are exhibitive activities, because each leaves a lasting artifact on a social networking site that is viewable by others. In the factor analysis section of this research, these four items make up the Social Network factors that involve creating a lasting display of self that is visible to others within the individual's social group. Additionally, since the mean importance rating among all subjects is 1.96, the preceding items are all above the mean in importance among all subjects.

The 10th most important activity for all subjects and for users was instant messaging using a computer program like AOL Instant Messenger or iChat (all subjects: $M = 1.88$, $SD = 1.29$; users: $M = 2.28$, $SD = 1.05$). This activity is similar to chat within a social networking site, but may be less readily accessible for users because it typically requires that special software be installed and running on the individual's computer in order to function.

The 11th most important activity for all subjects (and the 14th most important among users) was the use of games and applications from within a social networking site, (all subjects: $M = 1.56$, $SD = 1.17$; users: $M = 1.85$, $SD = 1.04$). These include social applications like Badoo, which allows users to identify individuals nearby who may be interested in dating or establishing a friendship, and games like Farmville, an agricultural simulation in which users trade virtual commodities. At the date of this writing, Badoo had more than 60 million users per month, and Farmville had almost 48 million users per month (AppData, 2011).

The following three items in importance for all users were activities that primarily involved the writing. Among these three, the one ranked as most important was the use of discussion boards (all subjects: $M = 1.19$, $SD = 1.24$; users: $M = 1.94$, $SD = 1.04$), followed by responding to blogs (all subjects: $M = 1.06$, $SD = 1.25$; users: $M = 1.89$, $SD = 1.11$), and then writing a blog (all subjects: $M = 1.03$, $SD = 1.22$; users: $M = 1.86$, $SD = 1.07$). It is notable that beginning with discussion board activities, standard deviations become larger than the mean score for importance, when analyzing data from all subjects. This indicates

excessive variation on ranking among all subjects. Among all subjects, this trend continues for the remaining items related to importance; this inverse ratio of mean to standard deviation does not occur in any of the data reported by users only.

The four items ranked lowest in importance among all subjects comprise the Performative factors for importance and frequency of use in the factor analysis portion of this research. These items are, in order of descending importance, live chat with strangers (all subjects: $M = .93$, $SD = 1.18$; users: $M = 1.83$, $SD = 1.05$); participating in group chat (all subjects: $M = .92$, $SD = 1.21$; users: $M = 1.87$, $SD = 1.10$); playing live online games (all subjects: $M = .82$, $SD = 1.14$; users: $M = 1.73$, $SD = 1.08$); and participating in virtual online environments like Second Life (all subjects: $M = .77$, $SD = 1.05$; users: $M = 1.63$, $SD = .97$).

*Frequency of communication activities*

Descriptive statistics were examined for the frequency with which subjects engaged in communication activities. Because one of the options on the survey for each communication activity was "I do not use this," means and standard deviations were evaluated both for all subjects and for those who used the communication activity to some degree (i.e. those who did not choose "I do not use this"). Means, standard deviations and sample sizes are provided in Table 2.

What is notable in examining the frequency of communication activities compared to the importance that subjects attach to those activities is the differing order of items. For example, text messaging was ranked third in importance, but it is ranked first in frequency

Table 1. Descriptive statistics for importance of communication activities

| | All Subjects | | | Users Only | | |
|---|---|---|---|---|---|---|
| Variable | *M* | *SD* | *N* | *M* | *SD* | *N* |
| 23.Face-to-Face | 4.25 | .86 | 603 | 4.25 | .86 | 603 |
| 24.Phone | 3.35 | .90 | 603 | 3.35 | .89 | 602 |
| 25.TextMsg | 3.21 | 1.07 | 603 | 3.26 | 1.00 | 594 |
| 33.E-mail | 2.81 | 1.16 | 600 | 2.90 | 1.07 | 583 |
| 27.SocNetChat | 2.42 | 1.25 | 603 | 2.59 | 1.11 | 564 |
| 31.ViewProfiles | 2.36 | 1.17 | 601 | 2.46 | 1.09 | 577 |
| 28.PersonUpdates | 2.26 | 1.23 | 601 | 2.41 | 1.12 | 564 |
| 29.UpdateProfile | 2.24 | 1.17 | 602 | 2.34 | 1.09 | 575 |
| 30.ShareContent | 2.19 | 1.20 | 600 | 2.35 | 1.08 | 559 |
| 26.InstantMsg | 1.88 | 1.29 | 603 | 2.28 | 1.05 | 497 |
| 32.SocNetApps | 1.56 | 1.17 | 600 | 1.85 | 1.04 | 507 |
| 34.DiscBoards | 1.19 | 1.24 | 602 | 1.94 | 1.04 | 371 |
| 36.BlogRespond | 1.06 | 1.25 | 603 | 1.89 | 1.11 | 339 |
| 35.BlogWriting | 1.03 | 1.22 | 601 | 1.86 | 1.07 | 335 |
| 39.StrangerChat | .93 | 1.18 | 603 | 1.83 | 1.05 | 307 |
| 40.GroupChat | .92 | 1.21 | 603 | 1.87 | 1.10 | 298 |
| 38.OnlineGames | .82 | 1.14 | 603 | 1.73 | 1.08 | 287 |
| 37.2ndLife | .77 | 1.05 | 602 | 1.63 | .97 | 283 |
| Valid N (listwise) | | | 593 | | | 230 |

*Note*. Numbers at the beginning of each item indicate the corresponding survey question. Items are listed by descending order of means for all subjects. For all communication activities and subjects, $M = 1.96$. For all communication activities by users only, $M = 2.51$.

of use. This difference between importance and frequency supports one of the original premises in the design of this research: the physical characteristics of various communication activities require different usage patterns that may not correspond with their importance. In the original proposal for this research, text messaging was used as an example of an activity that is likely to be used more frequently but may not be as important as other communication activities. Indeed, the mean scores for importance and frequency of text messaging indicate that is the case.

Across all communication activities, the mean frequency of use rating was 2.02 for all subjects and 2.65 for users of those communication methods. The same top nine items were above the overall means for all subjects and for users only. This is different from the importance of communication data, in which only five items were above the mean among users of those activities. The nine items above the mean for frequency of use were: text messaging from a cellular phone (all subjects: $M = 3.75$, $SD = 1.24$; users: $M = 3.81$, $SD = 1.15$); face-to-face communication (both groups: $M = 3.74$, $SD = 91$); use of a cellular or wired phone for voice calls (both groups: $M = 3.04$, $SD = 1.05$); viewing profiles of others on a social networking site (all subjects: $M = 2.91$, $SD = 1.21$; users: $M = 3.00$, $SD = 1.11$); posting personal updates (all subjects: $M = 2.71$, $SD = 1.42$; users: $M = 2.88$, $SD = 1.29$); chat on a social networking site (all subjects: $M = 2.69$, $SD = 1.43$; users: $M = 2.93$, $SD = 1.23$); use of e-mail (all subjects: $M = 2.65$, $SD = 1.20$; users: $M = 2.70$, $SD = 1.15$); updating a profile on a social networking site (all subjects: $M = 2.60$, $SD = 1.29$; users: $M = 2.73$, $SD = 1.19$); and sharing content on a social networking site (all subjects: $M = 2.44$,

$SD = 1.34$; users: $M = 2.65$, $SD = 1.90$). The placement of e-mail in this list demonstrates one of the trends identified by other researchers: the continuing functional importance of e-mail for young people, in spite of its decline in frequency of use. In a recent report on young people's use of e-mail from the Pew Internet & American Life Project, Lenhart (2010) wrote

> While email isn't used very much as a daily communication tool with friends, it is used, albeit less frequently, by most teens, and used mostly to talk to institutions, adults and others less reachable by text messaging, as well as when teens need to send longer and more complicated messages to a group. The data suggest that while email isn't used heavily by teens, it certainly hasn't disappeared, either.... it still has its own utility for teens in their communicative landscapes." (n.p.)

Among the top nine activities used more frequently by young people are the four communication activities identified in the factor analysis portion of this research as making up the Social Network factor: viewing the profiles of others, posting personal updates, updating personal profiles, and sharing content with others. These four activities rank above the mean for all activities in three different analyses: they are rated as more important than the mean for all subjects; they are used more frequently than the mean for all subjects; and they are used more frequently than the mean among users only. Such findings indicate that social networking does play and important role in the communicative practices of young people.

Among the nine items ranking below the mean in frequency of use, the first two are: using games and applications within a social networking site (all subjects: $M = 1.97$, $SD = 1.34$; users: $M = 2.28$, $SD = 1.16$), and instant messaging (all subjects: $M = 1.85$, $SD = 1.46$; users: $M = 2.38$, $SD = 1.21$). For the remaining seven items, the standard deviation is greater than the mean in the data from all subjects. This is not the case among users only. This inverse relationship indicates a substantial divergence between all subjects and users, and suggests that the means scores for these communication activities for all users are a poor representation of the data. Consequently, only the means of data from users will be discussed for the final seven items.

The next three communication activities are unique in that they are all related to the written word: posting articles on discussion boards ($M = 1.89$, $SD = 1.04$); responding to blogs written by others ($M = 1.80$, $SD = 1.05$); posting blogs ($M = 1.78$, $SD = 1.13$). The final four items, which are ranked lowest among users are the same four items that comprise the Performative factors for both frequency of use and importance of use in the factor analysis portion of this research.

## Correlations

To evaluate relationships that exist among the communication activities addressed in this research, bivariate correlations were evaluated among frequency of communication activities, and among importance of communication activities. Additionally, frequency data and importance data were each evaluated for correlations with scores on the EPSI identity subscale. Only four items from the EPSI identity subscale were determined to be valid in

Table 2. Descriptive statistics for frequency of communication activities

| | All Subjects | | | Users Only | | |
|---|---|---|---|---|---|---|
| Variables | *M* | *SD* | *N* | *M* | *SD* | *N* |
| 07.TextMsg | 3.75 | 1.24 | 606 | 3.81 | 1.15 | 596 |
| 05.Face-to-Face | 3.74 | .91 | 607 | 3.74 | .91 | 607 |
| 06.Phone | 3.04 | 1.05 | 606 | 3.04 | 1.05 | 606 |
| 13.ViewProfiles | 2.91 | 1.21 | 604 | 3.00 | 1.11 | 585 |
| 10.PersonUpdates | 2.71 | 1.42 | 606 | 2.88 | 1.29 | 571 |
| 09.SocNetChat | 2.69 | 1.43 | 606 | 2.93 | 1.23 | 556 |
| 15.E-mail | 2.65 | 1.20 | 606 | 2.70 | 1.15 | 595 |
| 11.UpdateProfile | 2.60 | 1.29 | 605 | 2.73 | 1.19 | 577 |
| 12.ShareContent | 2.44 | 1.34 | 606 | 2.65 | 1.19 | 559 |
| 14.SocNetApps | 1.97 | 1.34 | 606 | 2.28 | 1.16 | 522 |
| 08.InstantMsg | 1.85 | 1.46 | 605 | 2.38 | 1.21 | 471 |
| 16.DiscBoards | 1.11 | 1.22 | 606 | 1.89 | 1.04 | 356 |
| 18.BlogRespond | .96 | 1.18 | 606 | 1.80 | 1.05 | 324 |
| 17.BlogWriting | .93 | 1.21 | 606 | 1.78 | 1.13 | 315 |
| 20.Warcraft | .87 | 1.29 | 607 | 1.91 | 1.29 | 276 |
| 21.StrangerChat | .83 | 1.15 | 606 | 1.76 | 1.08 | 284 |
| 22.GroupChat | .77 | 1.13 | 606 | 1.70 | 1.11 | 273 |
| 19.2ndLife | .58 | .87 | 607 | 1.41 | .80 | 251 |
| Valid N (listwise) | | | 599 | | | 216 |

*Note*. Numbers at the beginning of each item indicate the corresponding survey question. Items are listed by descending order of means. For all communication activities and subjects, $M = 2.02$. For all communication activities by users only, $M = 2.65$.

the confirmatory factor analysis portion of this research, therefore, only the mean of those four items was used to evaluate the correlations presented here. Matrices showing correlations, as well as *p* values and sample sizes, are included in Appendix E and Appendix F.

*Frequency of communication activities and EPSI identity subscale*

Two-tailed Pearson's *r* correlations were conducted to determine relationships among the frequency of communication activities, and between the individual activities and the EPSI identity subscale. Of the 171 bivariate relationships that were examined, 105 were statistically significant at the .001 level, and 113 were significant at the .01 level, and 128 were significant at the .05 level. Significant correlations (both positive and negative) ranged in magnitude from .87 to -.08.

*EPSI identity subscale*. Although six of the correlations between the EPSI identity subscale scores and the frequency of communication activities were significant at the $p <$ .05 level, none of the correlations reached the .10 criterion of weak to moderate (Rubin, 2009). These correlations ranged from in magnitude from a high of .09 to -.82, with identity development scores showing the strongest relationship to e-mail use, $r(604) = .09$, $p < .05$.

Because of the large number of statistically significant relationships among the 152 bivariate correlations between the frequency of communication activities, the Bonferroni correction as applied to avoid Type I errors by establishing a significance level of $p <$ .05/153 (.00033). Even after this adjustment, 104 of the bivariate correlations remained

significant. Therefore, only correlations greater than +/-.50, which Rubin (2009) describes as strong, are discussed in the following section. A complete list of frequency-of-use correlations is provided in Appendix Table A.

Correlations between frequency of communication activities were examined and clustered into three groups. First, a number of social networking activities were strongly correlated with one another. These to involved posting status messages, viewing the profiles of others, and sharing pictures or other content (articles, jokes, videos), and updating a personal profile. The second and third groups were each distinct types of activities, but were strongly correlated between the two groups. The first of these was live online activities such as playing games and using virtual spaces, as well as live chat with strangers and groups. The second of these involved primarily written activities such as posting blogs, responding to blogs, and posting on discussion boards.

*Social networking activities*. A strong correlation was identified between viewing the profiles of others and updating one's own profile on a social networking site, $r(603) = .69$, $p < .01$, posting status messages, $r(604) = .69$, $p < .01$, and sharing pictures or other content (articles, jokes, videos) with others, $r(604) = .67$, $p < .01$. Because identity exploration typically involves both observing and copying the behavior of others (Sullivan, Perry, Gawell, & Cohen, 1953), there is theoretical relationship between posted information and observing the information posted by others.

Strong relationships were also observed between updating a personal profile on a social networking site and posting a personal status message for others to see, $r(605) = .71$,

$p < .01$, as well as with sharing pictures or other content (articles, jokes, videos), $r(605) = .64, p < .01$. Additionally, there was a strong relationship between sharing content and posting a status message $r(605) = .61, p < .01$. The relationships between these activities are consistent with Hogan's (2010) notion of exhibitive online identity exploration. Certainly, status messages provide more immediate information about what an individual is doing than updating a profile or sharing content, but since artifacts of all these activities are typically retained as part of the individual's profile or account (Nazir, Raza, & Chuah, 2008), all of these activities represent disclosure within the individual's social group.

*Writing activities*. Among all of the frequency of communication activities, the strongest correlation was between posting a blog and responding to a blog written by someone else, $r(606) = .87, p < .01$. This relationship is likely due to the fact that individuals who write blogs may be more likely to read and respond to similar content written by others. Ewins (2005) wrote that it is even common for blog writers to comment on their own blogs, particularly in response to a comment left by someone else.

Similarly, there were strong relationships between posting articles and comments on discussion boards and blog writing $r(606) = .69, p < .01$, and responding to blogs $r(606) = .64, p < .01$., as well as between blog writing and live group chat, $r(606) = .51, p < .01$.

*Live online interaction*. Strong correlations were observed between live chat with strangers online and chat with groups of strangers online, $r(605) = .72, p < .01$, with playing interactive online games $r(606) = .55, p < .01$, and with using virtual spaces $r(606) = .56, p < .01$. These relationship may be due to the fact that individual and group chat are less

distinct, and that live chat is so integral to online games such as World of Warcraft that users frequently develop "literacies" (Steinkuehler, 2007) that allow them to interact with individuals and groups as part of their activities. Interactions with strangers seldom occur within social networking sites, since these technologies are typically limited to friends and acquaintances (Boyd & Ellis, 2008). This relationship between online chat, and virtual and game interaction is supported by the fact that online one-to-one chat with strangers is correlated with the use of online virtual activities such as Second Life $r(606) = .56, p < .01$, and online games such as World of Warcraft $r(606) = .55, p < .01$. Interaction in virtual settings and playing online games were also correlated, $r(607) = .55, p < .01$.

Finally, strong relationships were observed between virtual activities and several written-word activities. Virtual interaction activities were correlated with blog writing, $r(606) = .67, p < .01$, responding to blogs, $r(606) = .60, p < .01$, and posting articles on discussion boards, $r(606) = .57, p < .0$.

Overall, the correlations between these activities into distinct clusters indicate that there are three primary groups of communication activities that are used together. The first group, which is most clearly delineated, comprises social networking activities. These typically involve sharing or creating content that can be seen by others, but this group also entails viewing the profiles posted by others. The second group involves live virtual activities including playing games, interacting in virtual spaces, and live chat with individual and groups of strangers. As noted earlier, since online games and virtual spaces

typically involve live chat with both groups and individuals, there connection between these activities is not surprising.

The final group, which overlaps with the second group, involves writing activities such as writing and responding to blogs, and posting comments and articles to discussion boards. Since all of these activities involve some level of visual anonymity and control of presentation of self, the connection between these activities is not unexpected. However, this relationship does not necessarily imply that these activities are used for the same purpose. Indeed, it could be argued engaging in discussions and blogging are largely rhetorical activities that do not require significant personal self-disclosure and therefore may not be related to adolescent identity exploration. Later in this research, exploratory and confirmatory factor analysis will be used to further explore the relationships between these activities.

*Importance of communication activities and EPSI identity subscale*

Two-tailed Pearson's *r* correlations were conducted to determine relationships among the importance of communication activities, and between the individual activities and the EPSI identity subscale. Of the 142 bivariate relationships that were statistically significant, 135 were significant at the .01 level and 7 were significant at the .05 level. The significant correlation with the strongest magnitude was .87. The significant correlation with the weakest magnitude was -.08. In the following sections, significant relationships greater than .10 between the importance of communication activities and EPSI identity subscale are addressed. Because of the large number of significant correlations between the

importance of communication activities, only those greater than .50 are discussed. A matrix of all correlations related to the importance of communication activities, and between these activities and EPSI identity subscale is provided in Appendix D.

*EPSI identity subscale*. Small (> .10) statistically significant correlations were identified between scores on the four-item version of the EPSI identity subscale and the importance of five communication activities. A positive correlation was identified between the identity development scores and both face-to-face communication, $r(607) = .13, p < .01$, and phone calls, $r(607) = .14, p < .01$. There is no clear relationship between these activities in the literature reviewed for this research; however, it is possible that individuals at higher levels of identity development may feel more confident using these more intimate interpersonal communication forms to coordinate activities with their peers. Those who are not as far along in the identity development process may prefer less personal communication activities, which give them greater opportunity to control or experiment with their presentation of self.

Similarly, scores on the EPSI identity subscale are negatively correlated with the use of virtual technologies, $r(601) = -.13, p < .01$, online chat with strangers, $r(601) = -.13, p < .01$, and online chat with groups of strangers $r(601) = -.13, p < .01$. This could indicate that those who are farther along in the identity development process eschew more performative or anonymous interaction, or that those who less developed may prefer these more impersonal activities.

*Social networking activities*. As in the previous section on frequency of communication activities, a number of large (>.5) statistically significant correlations were observed between the reported importance of social networking activities. Posting status updates was correlated with updating a social networking profile, $r(601) = .80, p < .01$, with viewing others' profiles, $r(599) = .65, p < .01$, sharing content, $r(601) = .13, p < .01$, with using social networking games or applications, $r(599) = .59, p < .01$, and with live chat within a social networking site, $r(601) = .13, p < .01$.

The importance of updating a personal profile was strongly correlated with viewing the profiles of others, $r(601) = .75, p < .01$, with sharing content with others, $r(600) = .71, p < .01$, with using of games and applications on social networking sites, $r(600) = .53, p < .01$, and live chat with others on a social networking site, $r(602) = .52, p < .01$. Finally, viewing the profiles posted by others was correlated with the use of applications and games on social networking sites, $r(599) = .53, p < .01$, with sharing content with others, $r(599) = .78$ $p < .01$, and with live chat within a social networking site, $r(601) = .54, p < .01$.

Taken together, these correlations would imply that users of social networking tend to engage in a variety of activities within the sites. Some of these activities, such as live chat, posting status updates, and using games or applications are more existential, clearly intended to interact at a specific time. Others, such as updating a profile are intended to last over time. Regardless of the time frame, these activities are deliberate interaction within a bounded social group that are intended to create an archive of information that lasts over time (Lewis, Kaufman, Gonzalez, Wimmer, & Christakis, 2008).

*Writing activities*. Several strong statistically significant correlations were also identified among between writing activities. Posting articles and responses on discussion boards was correlated with both writing blogs, $r(602) = .78, p < .01$, and responding to blogs, $r(6012) = .72, p < .01$. Additionally, writing blogs was correlated with responding to blogs, $r(601) = .87, p < .01$.

*Live online interaction*. Among live online interaction, correlations existed between chatting with strangers and chatting with groups, $r(603) = .82, p < .01$, as well as with virtual activities, $r(603) = .58, p < .01$, and with playing online games, $r(602) = .66, p < .01$. Similarly, group chat was strongly correlated with virtual activities, $r(602) = .63, p < .01$, and with online gaming, $r(603) = .57, p < .01$. Finally, there was a strong correlation between playing online games and online virtual activities, $r(602) = .59, p < .01$.

*Live online interaction and writing activities*. Similar to the earlier findings regarding correlations between the frequency of communication forms, a number of strong correlations were noted between the importance live activities such as chat with strangers and game playing, and activities primarily involving writing. Playing online games was correlated with blog writing, $r(600) = .60, p < .01$. Engaging in online virtual activities was correlated with blog writing, $r(602) = .78, p < .01$, with responding to blogs, $r(602) = .71, p < .01$, and with using online discussion boards, $r(601) = .66, p < .01$. Chatting online with individual strangers was correlated with blog writing, $r(603) = .58, p < .01$, with responding to blogs, $r(602) = .78, p < .01$, and with using online discussion boards, $r(602) = .62, p < .01$. Chatting online with groups of strangers was correlated with blog writing, $r(601) =$

.57, $p < .01$, with responding to blogs, $r(603) = .58$, $p < .01$, and with using discussion boards, $r(602) = .59$, $p < .01$.

## Exploratory Factor Analysis: Importance of Use

*Measures of sampling adequacy*

Several criteria were initially applied to determine the factorability of the 18 items related to the importance subjects attached to communication activities. All of these benchmarks were applied before or during the first factor analysis. Initially, the data were screened for errors and outliers, and none were identified. A total of 593 out of 607 subjects responded to all 18 of the items related to the importance of communication activities.

To determine whether 593 cases was an adequate sample size for this research, a variety of sources were consulted and it was apparent that there are no rigid standards in this area (Pedhazur & Schmelkin, 1991). Comrey (1992) wrote that there should be at least five times as many subjects as the number of factors anticipated, but in no instance should there be less than 200 cases. For the purposes of this research, Nunnally's (1978) suggested standard of 10 times as many subjects as variables was selected. Since this portion of the analysis uses 18 variables related to various communication activities, the current sample of 32 cases per variable (593 total cases) exceeded the minimum suggested by Nunnally and also exceeded the 200-case minimum suggested by Comrey.

The next criterion applied to the data used for this research was a review of the correlations between the individual items. Tabachnick and Fidell (2001) wrote that,

"a matrix that is factorable should include several sizable correlations" (p. 589), and they suggest .30 is a reasonable expectation of those correlations. All but one of the variables related to the importance of communication activities had at least one significant ($p < 0.01$) correlation at the .30 level or higher with another variable in the same group. During the initial factor analysis, all of the communalities for the individual variables were greater than .3, as suggested by Gorsuch (1983).

The Kaiser-Meyer-Olkin measure of sampling adequacy was .89, well above the standard of .6 used by most researchers (Sheskin, 2007), and Bartlett's Test of Sphericity was significant, $\chi^2$ (153) = 6454.27, $p < .01$. Finally, the diagonal values of the anti-image correlation matrix were all greater than .5, indicating that all items were appropriate for analysis. Taken together, these measures indicate that the 18 items related to the reported importance of communication activities are appropriate for principal components analysis.

*Factoring procedures*

For this portion of the research, items were retained that had a minimum primary loading of .60 with no cross-loadings greater than .40 (Treiblmaier & Filzmoser, 2010). The number of factors for all solutions were determined based on the Kaiser (1960) criterion of having an eigenvalue greater than 1.

Correlation of the factors was used to determine whether to select an orthogonal or oblique solution. Brown (2009) wrote that orthogonal rotation assumes that the factors are uncorrelated. Therefore, if analysis indicates a correlation of greater than +/-.32 between any of the factors, retaining an oblique solution is warranted without a compelling reason

for an orthogonal solution. After running the first factor analysis, three factors had eigenvalues greater than 1 and one pair of factors had a correlation of .34. Therefore, the oblique rotation performed in the initial analysis was maintained.

The oblimin (oblique) rotation produces two factor matrices: one describes the pattern of the factors and another describes the structure of the factors. Each matrix was analyzed using Thurstone's (1947) criteria for simple structure, and the pattern matrix was chosen for interpretation because of its simplicity. This determination was also consistent with Rummel's (1970) contention that the pattern matrix typically provides clearer factor loadings.

After the first factor analysis was performed, the following three items were dropped because they did not have adequate primary loadings: sending or receiving text messages from a cell phone; sending or receiving instant messages using a computer program; and sending or receiving e-mail. After the second rotation, all items were loaded on at least one of the three factors. However, one of the factors included only two items. Tabachnick and Fidell (2001) wrote that two-item factors are likely to be unstable, and should only be retained if there are high levels of correlation between the two items and low correlations with all other items. Because the correlation between these two items was only .27, they were dropped from the analysis. This decision was confirmed by the fact that this item had a Cronbach coefficient alpha score of .42, well below the .7 deemed acceptable for scale reliability in most research.

After the third oblimin rotation was performed, three items that were inconsistent with the theoretical basis of this search were dropped from the second factor: posting and responding to others on an online announcement or discussion board (survey question 27); writing or posting a blog or other online article or journal (survey question 28); and responding to an online blog or other online article or journal (survey question 29). Discussion of why these items were excluded from the analysis is included in descriptions of the factors in the following section.

The final factor analysis included 10 items, each loading on one of two factors. Sampling adequacy measures conducted prior to this analysis were revisited to ensure adequate factorability of the data used for the final set of factors. All of the communalities for the 10 items remained greater than the standard value of .3 (Gorsuch, 1983). The Kaiser-Meyer-Olkin measure of sampling adequacy was .86, well above the standard of .6 used by most researchers (Sheskin, 2007), and Bartlett's Test of Sphericity was significant, $\chi^2$ (78) = 3800.26, $p < .01$. The final factor solution had two factors (eigenvalues ≥ 1.0) and explained 70.50% of variance (Table 3). Correlation between the Performative-Importance and Social Network-Importance factors was .30. Because this correlation was less than +/- .32 after the non-loading items were dropped from the analysis an orthogonal (varimax) rotation was used for the final factor analysis. Together, these items all indicate that the data employed for the final solution retained factorability.

A matrix of all items and factors are provided in Table 2. The survey conducted for this research allowed individuals to indicate that they did not engage in certain

communication activities (presumably because they were not at all important). Therefore, mean scores were included for all respondents and for those attributed some degree of importance to the activity.

*Factors identified*

*Factor 1: Social Network-Importance*. The first factor identified accounted for 47.13% of the total variance and included six items that were all related to the use of social networking sites such as Facebook (Table 3). These items were as follows: participating in live chat sessions with others using a social networking site; posting status messages using a social networking site to communicate what the author is thinking or doing; updating a personal profile on a social networking site; posting pictures or other content on a social networking site; viewing profiles posted by others on a social networking site; and using

Table 3. Eigenvalues and percent of variance explained for the importance of communication activities after elimination of non-loading variables

| | Eigenvalues | % of Variance | Cumulative % |
|---|---|---|---|
| 1 | 4.71 | 47.13 | 47.13 |
| 2 | 2.34 | 23.37 | 70.50 |
| 3 | .63 | 6.27 | 76.77 |
| 4 | .55 | 5.50 | 82.27 |
| 5 | .46 | 4.64 | 86.91 |
| 6 | .37 | 3.73 | 90.64 |
| 7 | .37 | 2.68 | 94.32 |
| 8 | .22 | 2.16 | 96.49 |
| 9 | .19 | 2.88 | 98.37 |
| 10 | .16 | 1.63 | 100.00 |

games and other applications on a social networking site.

This factor, which is referred to as the Social Network-Importance factor focuses on forms of interaction related to deliberate presentation of self within the individual's existing social group (Boyd & Ellis, 2008; Hogan 2010). This sort of identity experimentation is important, and particularly pronounced, for young people during their adolescence (Erikson & Erikson, 1997; Erikson, 1959). Moreover, research indicates that such online environments have become particularly important platforms in recent years for identity experimentation among adolescents and emerging adults (Huffaker & Calvert, 2005; Schmitt, Dayanim, & Matthias, 2008; Valkenburg & Peter, 2008; Valkenburg, Schouten, & Peter, 2005).

The primary loadings for the Social Network-Importance factor are generally high, and cross-loadings with the Performative-Importance are all zero loadings (Gorsuch, 1983) except one, indicating a simple, parsimonious structure (Thurstone, 1947). Loadings for both factors are presented in Table 4.

*Factor 2: Performative-Importance*. Factor 2 accounted for 23.37% of the total variance and included four items (Table 4). The four communication activities identified as part of the first factor offer subjects the ability to interact live in a real-time digital environment: playing online interactive games such as World of Warcraft; interacting in virtual worlds such as Second Life; chatting online live (via text, voice or video) with individuals whom the subject had not met face-to-face; and chatting online live (via text, voice or video) with groups of people the subject had not met face-to-face. These four

items clearly fit together since all focus on engaging in real-time social interaction primarily with strangers, or at least with individuals that the subjects had not met in a face-to-face setting.

Three of the items that were dropped from this factor, despite having adequate loadings, involved primarily written online expression in a public setting: posting messages and responding to others in an online discussion board; writing and posting blogs or online articles; and responding to blogs or online articles. Such communication typically involves asynchronous interaction — rather than the live interaction evident in the other four items — that allows a manageable presentation of ideas and information by adolescents (Huffaker & Calvert, 2005). However, the use of these written forms of communication is typically not conducive to conveying the primary presentation of self that would be consistent with identity exploration. As Hogan (2010) notes, there is a distinction between those who explore identity online by creating an "exhibit" and those who "perform" using electronic communication forms. Therefore, although these communication activities may be considered important by those who use performative activities, this does not mean that they were necessarily used as a mechanism for identity exploration.

Taken together, the four items that constitute the second factor are communication activities that allow the individual considerable control over his or her presentation of self to the public at large and especially to strangers. Consequently, this factor has been titled the Performative-Importance factor, because it facilitates the participation in those sorts of

"on stage" activities that can be performed in front of an audience that the individual does not necessarily know in a face-to-face setting and potentially may never encounter again.

Table 4. Final communalities and factor loadings for importance of communication activities

| Survey Item Number and Variable | Factor | | | All Subjects | | Users Only | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | Communalities | *M* | *SD* | *M* | *SD* |
| Factor 1: Social Network-Importance | | | | | | | |
| 27.SocNetChat | -.01 | **.70** | .49 | 2.42 | 1.25 | 2.59 | 1.11 |
| 28.PersonUpdates | -.05 | **.90** | .78 | 2.26 | 1.23 | 2.41 | 1.12 |
| 29.UpdateProfile | -.01 | **.90** | .79 | 2.23 | 1.16 | 2.34 | 1.09 |
| 30.PostContent | .00 | **.84** | .71 | 2.19 | 1.20 | 2.35 | 1.08 |
| 31.ViewProfile | -.04 | **.90** | .79 | 2.35 | 1.17 | 2.46 | 1.09 |
| 32.SocNetApps | .25 | **.60** | .53 | 1.55 | 1.15 | 1.85 | 1.04 |
| Factor 2: Performative-Importance | | | | | | | |
| 37.2ndLife | **.84** | .01 | .72 | .74 | 1.02 | 1.63 | .97 |
| 38.OnlineGames | **.76** | -.08 | .54 | .81 | 1.14 | 1.73 | 1.08 |
| 39.StrangerChat | **.86** | -.04 | .72 | .91 | 1.17 | 1.83 | 1.05 |
| 40.GroupChat | **.86** | -.11 | .69 | .91 | 1.21 | 1.87 | 1.10 |

This theatrical aspect of the Performative-Importance factor is particularly evident in online interaction using technologies such as World of Warcraft and Second Life, which allow individuals from around the world to interact in a visual and auditory fantasy setting. For example, the World of Warcraft game, which is probably the most popular of these

services, had more than 12 million worldwide users in 2010 (Blizzard Entertainment, 2010). Participation in this game presents young people with the opportunity to interact within a large-scale realm using customizable visual representations of themselves called *avatars*. The fluid nature of such digital settings allow participants an unprecedented opportunity to experiment with their identities by customizing their avatars with almost any appearance or virtual ability they choose, and to interact with any of the millions of participants who inhabit these digital environments (Mennecke et al., 2007).

Overall, the simplicity of this factor (Thurstone, 1947) is generally good, indicating a relatively parsimonious structure. All of the cross-loadings are relatively small, and none of the items are complex variables, which Brown (2009) defines as having a cross-loading of .30 or greater with another factor.

*Factor descriptive statistics*

Composite scores were created for each of the factors related to the importance of communication activities. These scores were generated based on the mean of the variables that had their primary loadings on each factor. Descriptive statistics for the composite scores and the variables that constitute them are provided in Table 5. Reliability measures for the items composing each factor were examined by conducting a Cronbach's coefficient alpha on the individual items that comprise each factor. The Social Network-Importance factor had an alpha of .92, and the Performative-Importance factor had an alpha of .88, well above the minimum .70 expected for reliability.

Exploratory Factor Analysis: Frequency of Use

*Measures of sampling adequacy*

A total of 216 out of 607 subjects indicated that they participated to some degree in all 18 communication activities related to frequency of use. Because non-use is a valid response (i.e., "I do not use this at all") to questions about how often an individual has chosen to use a particular communication activity, these responses were coded as a zero in the data, rather than excluded from analysis. With these non-use cases included, 599 surveys provided complete data regarding frequency of use. This number of responses is well within Nunnally's (1978) suggested minimum of 10 cases per variable and Comrey's (1978) minimum of 200 cases per study.

Table 5. Descriptive statistics for the two factors related to importance of communication activities

| Factor | Items | *M (SD)* | Skewness | Kurtosis | Alpha |
|---|---|---|---|---|---|
| 1. Social Network-Importance | 4 | 2.26 (1.07) | .27 | -.10 | .92 |
| 2. Performative-Importance | 4 | .86 (.99) | 1.15 | .86 | .88 |

Several steps were taken to ensure the factorability of the original data. Initially, the data were screened for anomalies and outliers, and none were found. Consistent with Tabachnick and Fidell's (2001) contention that that factorable data should include several correlations greater than +/-.30, all but three of the variables had at least one significant ($p < 0.01$) correlation with another variable related to communication frequency at the .30

level or greater. Additionally, all of the communalities for the individual variables were greater than .3 (Gorsuch, 1983) during the initial factor analysis.

During the initial varimax factor analysis, the Kaiser-Meyer-Olkin measure of sampling adequacy was .88, and Bartlett's Test of Sphericity was significant, $\chi^2$ (153) = 4943.47, $p < .01$. The diagonal values of the anti-image correlation matrix were all greater than .5, indicating that all items were appropriate for analysis. Taken together, these measures indicate that the 18 items related to the reported frequency of use were appropriate for factor analysis.

*Factoring procedures*

Consistent with the previous factor analysis related to the importance of communication activities, the criteria established for retaining variables was that they have a minimum primary loading of .60 with no cross-loadings greater than .40. In the preliminary rotation, oblimin rotation produced a four-factor solution, based on the criterion of having eigenvalues of 1 or greater. Because all factor correlations for this solution were less than +/-.32, an orthogonal solution was used. Varimax rotation was chosen in order to clearly delineate the factors from one another.

Using varimax rotation, four factors met the general criteria of having eigenvalues greater than 1. However, the four-factor solution was rejected for several reasons. First, the initial scree plot clearly showed an obvious change in slope after the third factor. Second, the four-factor solution produced two single-item factors, which would have been

immediately excluded to ensure parsimony (Hair, 2006). Therefore, the researcher chose a three-factor solution for preliminary analysis.

After the initial three-factor solution was generated using varimax rotation, six items were dropped because they did not meet the minimum factor loadings: face-to-face communication; text messaging from a cell phone; instant messaging using a computer program; live chat on a social networking site; using games or applications on a social networking site; and sending or receiving e-mail.

The factor analysis was performed again with the non-loading variables excluded and three more items were dropped because they did not meet the criteria of a primary loading of +/-.60 or higher and no cross loadings of +/-.40 or greater: posting and responding to messages on an online bulletin board; writing a blog or online article; and responding to a blog or online article.

Factor analysis on the remaining nine items produced two factors with eigenvalues greater than 1. The item "talking on the phone (cell phone or wired telephone) with others" was dropped because it did not have adequate loadings on any factor. The final set of factors were generated using the remaining eight items, which were evenly distributed across the two-factor solution specified (Table 6).

The final analysis included eight variables, each loading on one of two factors (eigenvalues > 1.0), and explained 71.75% of the variance. The measures of sampling adequacy conducted prior to this analysis were revisited to ensure adequate factorability of the data used for the final set of factors. All of the communalities for the eight items

Table 6. Eigenvalues and percent of variance explained for frequency of communication activities after elimination of non-loading variables

| | Initial Eigenvalues | | |
|---|---|---|---|
| Factor | Total | % of Variance | Cumulative % |
| 1 | 3.28 | 40.96 | 40.96 |
| 2 | 2.46 | 30.80 | 71.75 |
| 3 | 0.55 | 6.84 | 78.59 |
| 4 | 0.44 | 5.51 | 84.10 |
| 5 | 0.41 | 5.14 | 89.24 |
| 6 | 0.31 | 3.83 | 93.08 |
| 7 | 0.28 | 3.48 | 96.56 |
| 8 | 0.28 | 3.45 | 100.00 |

remained greater than the standard value of .3 (Gorsuch, 1983). The Kaiser-Meyer-Olkin measure of sampling adequacy was .86, well above the standard of .6 used by most researchers to indicate adequate levels of common variance (Sheskin, 2007), and Bartlett's Test of Sphericity was significant, $\chi^2$ (153) = 2024.54, $p < .01$.

*Factors identified*

*Factor 1: Social Network-Frequency*. The first factor identified accounted for 40.96% of the total variance and included four items that specifically referred to the functionality available on Facebook and other social networking sites (Table 7). These items were as follows: posting personal status messages on social networking sites (e.g., Facebook, Twitter) to communicate what an individual is thinking or doing; updating a

personal profile on a social networking site; posting pictures or other content on a social networking site; and viewing profiles posted by others on a social networking site.

This factor, which was named Social Network-Frequency, loaded on exactly the same variables as the Social Network-Importance factor identified in the earlier section of this research. Consequently, both of these factors have been given parallel titles. Additionally, both the current factor and its counterpart had zero loadings (i.e., between -.10 and .10) on all cross-loadings. This clear demarcation between variables reflects what Thurstone (1947) called "simple structure," indicating that this factor was highly parsimonious. Taken together, the strengths and similarities of these two parallel factors support the convergent validity of social networking activity as an integrated dimension of online communication.

*Factor 2: Performative-Frequency*. Factor 2 accounted for 30.80% of the total variance and included four items (Table 7). As with the social networking factors, this factor is almost identical to the Performative-Importance factor identified in the previous section of this research. Consequently, this factor was named the Performative-Frequency factor.

*Factor descriptive statistics*

Composite scores were created for each of the factors related to frequency of communication activity. These scores were the mean of the variables that comprised each factor. Table 8 presents descriptive statistics for both the composite scores and the variables that constitute them. Reliability for the items comprising each factor was examined by conducting a Cronbach's coefficient alpha on the items that make up each

Table 7. Final communalities and factor loadings for frequency of communication activities

| Survey Item Number and Activity | Factor | | Communalities | All Subjects | | Users Only | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | | *M* | *SD* | *M* | *SD* |
| Factor 1: Social Networking-Frequency | | | | | | | |
| 10.PersonUpdates | **.86** | .07 | .75 | 2.71 | 1.43 | 2.88 | 1.29 |
| 11.UpdateProfile | **.88** | .05 | .77 | 2.60 | 1.29 | 2.73 | 1.19 |
| 12.ShareContent | **.83** | .07 | .70 | 2.44 | 1.34 | 2.65 | 1.19 |
| 13.ViewProfile | **.88** | .04 | .77 | 2.91 | 1.21 | 3.00 | 1.19 |
| Factor 2: Performative-Frequency | | | | | | | |
| 19.VirtualWorld | .17 | **.79** | .66 | .57 | .85 | 1.41 | .80 |
| 20.OnlineGames | -.01 | **.78** | .61 | .85 | 1.28 | 1.91 | 1.29 |
| 21.StrangerChat | .06 | **.86** | .74 | .81 | 1.14 | 1.76 | 1.08 |
| 22.GroupChat | .01 | **.86** | .74 | .76 | 1.13 | 1.70 | 1.11 |

Table 8. Descriptive statistics for the two factors related to frequency of communication activities

| Factor | Items | M (SD) | Skewness | Kurtosis | Alpha |
|---|---|---|---|---|---|
| 1. Social Network-Frequency | 4 | 2.67 (1.14) | -.07 | -.30 | .89 |
| 3. Performative-Frequency | 4 | .75 (.91) | 1.28 | 1.13 | .84 |

factor. The Social Network-Frequency and Performative-Frequency factors had alphas of .89 and .84, respectively. These are well above the minimum .70 expected for reliability.

## Confirmatory Factor Analysis

Confirmatory factor analysis was performed using LISREL 8.80 to determine the goodness of fit for the factors identified in the two exploratory factor analyses performed in this research. Because this study used research questions, not hypotheses, and because there was only one data set, the validity of the empirically derived two-structure models were compared to the single-factor models. The ESPI identity subscale was also evaluated using confirmatory factor analysis. Because the two other EPSI subscales — autonomy and intimacy — were included in the survey questions for this research, a three-factor solution was tested to determine the divergent validity of the identity subscale.

Several a priori criteria were established for the models tested using confirmatory factor analysis. Hu and Bentler (1999) suggest that values of .95 and above indicate a good model fit, and values between .90 and .95 indicate an adequate fit for the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), and the comparative fit index (CFI). For root mean square error of approximation (RMSEA), a score of less than .05 indicates a close model fit, less than .08 indicates a reasonable fit. Scores greater than or equal to .10 indicate a poor fit (Kline, 2005). A $\chi^2$ to degrees of freedom ratio of five or less was used to determine a good fit of the data to the hypothesized model, while controlling for sample size. Items were retained based on a loading of .64 or greater (Harrington, 2008). All factor loadings were evaluated at the $p < .05$ level.

*Importance of use*

Confirmatory factor analysis was performed to examine the validity of the two factors identified related to adolescent's reported importance of communication activities. This analysis was conducted to test the goodness of fit between three models and the data collected for this research. The first model was a single-factor model using the 10 items having significant loadings on either of the factors identified using exploratory factor analysis. The second model reflected the final two-factor solution from the exploratory factor analysis conducted in the previous section of this research, and included the variables shown in Table 6. The third model reflected the factors remaining after removing cross-loaded items.

The single-factor confirmatory factor analysis was computed using the 10 items related to the importance of communication activities. The fit of the data to this model was poor. The significant $p$ value indicates less than adequate fit between the single-factor model and the observed data, $\chi^2$ (35, N = 600) = 1444.28, $p < .05$, and the $\chi^2/df$ was 41.37, well beyond the acceptable level of 5, indicating that the fit was not adequate. Similarly, the GFI was .63, the AGFI was .42, and CFI was .75, all well below the expected level of .90 (Table 9).

The two-factor confirmatory factor analysis of these same data was conducted and the model fit improved significantly. The chi-square was significant $\chi^2$ (34, N = 600) = 225.54, $p < .05$, but the $\chi^2/df$ ratio was 6.63, which was close to the accepted threshold of 5. The GFI was .93, indicating an adequate fit for the model. The CFI was .97, indicating a

good fit for the model. However, the AGFI was .89, which is below the .90 level for an adequate fit. The RMSEA was .095, barely below the .10 level for a poor fit.

The final model was a modified version of the second, two-factor model of the measure identified in the exploratory factor analysis. This final model dropped two variables due to loadings less than .64 (Harrington, 2008). The first item dropped as using online games and other applications within social networking sites. The second item was using live chat within social networking sites. The final model did include a slight (.09) cross-loading between the Social Networking factor and the use of online virtual applications such as Second Life. However, this item was retained because of the small size of the coefficient and the consistency of this communication activity with the other items in the Performative factor.

Table 9. Summary of fit indicators for confirmatory factor analysis for importance-of-use factors

| Models | $\chi^2$ | df | p | $\chi^2$/df | RMSEA | GFI | AGFI | CFI |
|---|---|---|---|---|---|---|---|---|
| 1. Importance of communication activities as a one-factor model | 1444.28 | 35 | < .05 | 41.27 | .28 | .63 | .43 | .75 |
| 2. Initial importance of communication activities as a two-factor model | 225.54 | 34 | < .05 | 6.63 | .095 | .93 | .89 | .97 |
| 3. Final importance of communication activities as a two-factor model | 126.38 | 19 | < .05 | 6.65 | .098 | .95 | .90 | .97 |

*Note*. RMSEA = root mean square error of approximation; GFI = goodness of fit index; GFI = adjusted goodness of fit index; CFI = comparative fit index.

The final model indicated a good fit to the data, which was slightly improved over the

second model. The $\chi 2/df$ ratio was 6.65, which was close to the accepted threshold of 5. The AGFI was .90, indicating an adequate fit of the model. The GFI and CFI were .95 and .97 respectively, indicating a good model fit. The RMSEA was slightly below the .10 threshold, placing it in range of an adequate model fit. Taken together, the final model represents a superior fit over the single-factor model and an improved fit over the initial two-factor model identified in the exploratory factor analysis. The path diagram for the final model is presented in Figure 1. The standardized factor loadings and standard error for each communication activity in the final model are shown in Table 10.

*Frequency of use*

Confirmatory factor analysis was conducted to evaluate the validity of the factors identified related to subjects reported frequency of communication activities. This analysis was conducted to test the goodness of fit between two models and the data collected for this research. The first model was a single-factor model using the eight items that had significant loadings on the Social Networking and Performative factors related to frequency of use that were identified using exploratory factor analysis. The second model reflected the final two-factor solution from the exploratory factor analysis.

The two-factor confirmatory factor analysis of these same data was conducted and the model fit improved significantly. The $\chi^2$ (19, N = 603) = 63.44, $p < .05$, to $df$ ratio was 3.34, which indicated an acceptable fit given the sample size. The GFI was .97, the CFI was .98, and the AGFI was .95, all indicating a good fit. The RMSEA was .06, which is

Table 10. Standardized factor loadings and standard error for each item in the final model related to importance of communication activities

| Communication Activity and Factor | Factor Loading | *SE* |
|---|---|---|
| **Social Networking Factor Activity** | | |
| 28. Posting a status message on a site like Facebook, MySpace or Twitter to tell others what you are thinking, feeling or doing right now | .86 | .04 |
| 29. Creating or updating your personal profile on a site like Facebook or MySpace | .89 | .04 |
| 30. Sharing pictures or other content (articles, jokes, videos) on a site like Facebook or MySpace | .82 | .04 |
| 31. Viewing or responding to profiles, pictures or content posted by others on a site like Facebook or MySpace | .87 | .04 |
| **Performative Factor Activity** | | |
| 37. Using an online virtual space like Second Life that is not primarily a game | .73 | .04 |
| 38. Playing an online interactive game like World of Warcraft with others | .69 | .04 |
| 39. Participating in a live online chat (text or voice or video) with another person I have **not** met face-to-face | .93 | .04 |
| 40. Participating in a live group discussion (text or voice or video) with a group of people I have not met face-to-face | .87 | .04 |

*Note*. Numbers at the beginning of each item indicate the corresponding survey question.

below the .8 and therefore indicates a reasonable fit. The path diagram for the final model is presented in Figure 2. Fit indicators for both models are presented in Table 11.

The fit of the second model confirmed the two-factor model using the same eight items identified using exploratory factor analysis. This model included a small (.13) cross-loading between the Social Networking factor and the use of online applications such as Second Life. This same cross loading was also identified in the confirmatory factor analysis performed for importance of communication activities. As with the previous analysis, this item was retained because of the small coefficient size and the consistency of this activity with the other items in the Performative factor. Factor loadings and standard error for the final model are presented in Table 12.

*EPSI identity subscale*

Confirmatory factor analysis was used to determine the validity of the identity subscale of the EPSI. Because data for two additional subscales of the EPSI were collected in the survey for this research, a three-factor solution was initially tested with each subscale hypothesized as a factor. This model showed low loadings across all three factors. Items on the intimacy scale ranged from .21 to .63. (The second highest loading was .56.) Because the criterion of retaining items was a loading of .64 or greater (Harrington, 2008), all of the intimacy items were excluded from analysis. Items on the autonomy subscale ranged from .13 to .57, plus one item at .64. Because of the weakness of a single-item factor, the autonomy items were dropped from the analysis as well. Additionally, only two items from the identity scale were .64 or greater. Finally, there were a number of cross-loadings between the scales. Eight items from the identity scale cross-loaded on one or both of the other two factors, and two items from the autonomy scale cross-loaded on the identity

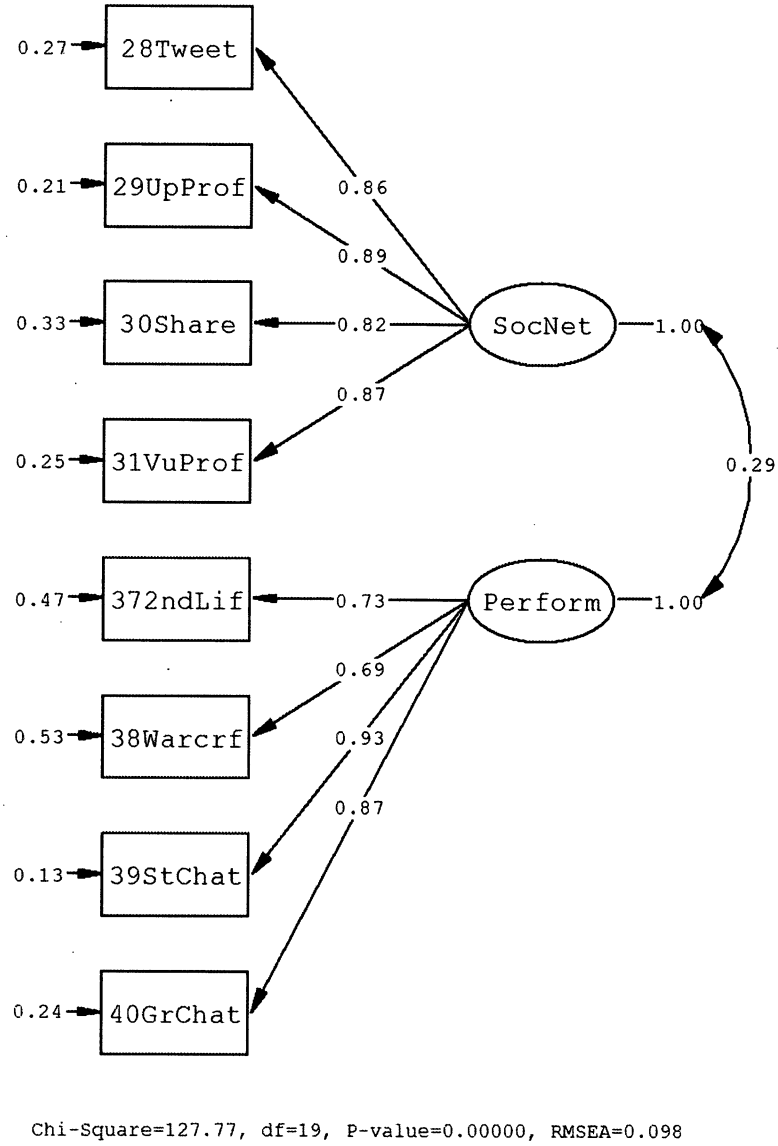


Figure 1. Two-factor confirmatory factor analysis model for importance of communication activities.

*Note*. Two-digit numbers at the beginning of each item name indicate the corresponding survey question. 28Tweet = posting a personal status message on a site like Facebook, MySpace or Twitter; 29UpProf = creating or updating a personal profile on a social networking site; 30Share = share content on a social networking site; 31VuProf = viewing or responding to others' profiles; 372ndLif = using a virtual space like Second Life; 38Warcrf = playing an online interactive game like World of Warcraft; 39StChat = live chat with a stranger; 40GrChat = live online chat with a group of strangers.

Table 11. Summary of fit indicators for confirmatory factor analysis for frequency-of-use factors

| Models | $\chi^2$ | df | p | $\chi^2$/df | RMSEA | GFI | AGFI | CFI |
|---|---|---|---|---|---|---|---|---|
| 1. Importance of communication activities as a one-factor model | 1020.67 | 20 | < .05 | 51.03 | .32 | .66 | .39 | .66 |
| 2. Final importance of communication activities as a two-factor model | 63.44 | 19 | < .05 | 3.34 | .06 | .97 | .95 | .98 |

*Note*. RMSEA = root mean square error of approximation; GFI = goodness of fit index; GFI = adjusted goodness of fit index; CFI = comparative fit index.

factor. The lack meaningful divergence between the three factors is likely due to the constructs measured by these subscales. The autonomy subscale measures development that typically occurs in early childhood (Erikson, 1950), which may have a marginal relationship to the identity development status of individuals in their late teens and early 20s. Additionally, since intimacy development typically occurs in the mid- to late-20s, it is unlikely that the intimacy subscale would provide meaningful data when conducted for younger individuals.

Because of the limited number of items with adequate loadings, the three-factor model was rejected and a single-factor model was evaluated using only the items on the identity subscale. Initially, three items of the single factor model had loadings of .64 or greater. One item had a loading of .62. Because this item was close to the criterion for retention, and because scales with less than four items tend to have lower reliability and internal consistency (Clark & Watson, 1995; Saucier and Goldberg, 2002) this item was retained.

Table 12. Standardized factor loadings and standard error for each item in the final model related to frequency of communication activities

| Communication Activity and Factor | Factor Loading | *SE* |
|---|---|---|
| **Social Networking Factor Activity** | | |
| 28. Posting a status message on a site like Facebook, MySpace or Twitter to tell others what you are thinking, feeling or doing right now | .83 | .05 |
| 29. Creating or updating your personal profile on a site like Facebook or MySpace | .84 | .04 |
| 30. Sharing pictures or other content (articles, jokes, videos) on a site like Facebook or MySpace | .76 | .05 |
| 31. Viewing or responding to profiles, pictures or content posted by others on a site like Facebook or MySpace | .83 | .04 |
| **Performative Factor Activity** | | |
| 37. Using an online virtual space like Second Life that is not primarily a game | .69 | .03 |
| 38. Playing an online interactive game like World of Warcraft with others | .66 | .05 |
| 39. Participating in a live online chat (text or voice or video) with another person I have **not** met face-to-face | .85 | .04 |
| 40. Participating in a live group discussion (text or voice or video) with a group of people I have not met face-to-face | .83 | .04 |

*Note*. Numbers at the beginning of each item indicate the corresponding survey question.

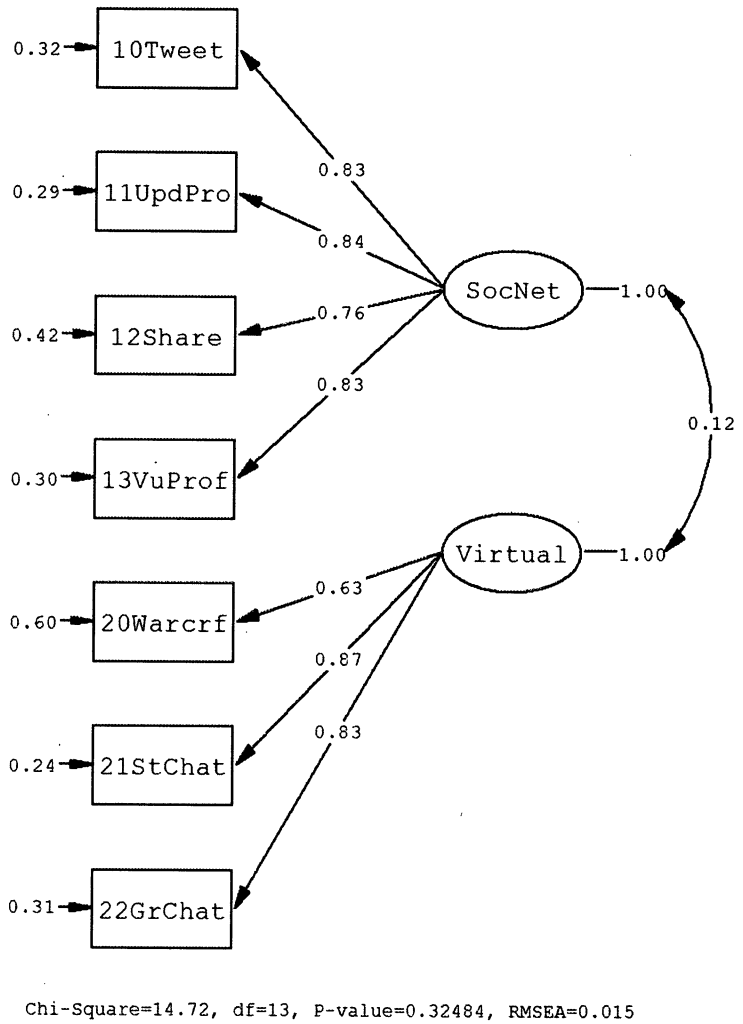


Figure 2. Two-factor confirmatory factor analysis model for frequency of communication activities.

*Note*. Two-digit numbers at the beginning of each item name indicate the corresponding survey question. 10Tweet = posting a personal status message on a site like Facebook, MySpace or Twitter; 11UpProf = creating or updating a personal profile on a social networking site; 12Share = sharing content on a social networking site; 13VuProf = viewing or responding to others' profiles; 192ndLif = using a virtual space like Second Life; 20Warcrf = playing an online interactive game like World of Warcraft; 21StChat = live chat with a stranger; 22GrChat = live online chat with a group of strangers.

The four-item single-factor model was evaluated and the fit of the model was good. The $\chi^2$ (2, N = 601) = .79, $p$ = .79, was non-significant and the ratio of the chi-squared

statistics to the *df* was .23. The GFI, AGFI, and CFI were all 1.00, indicating a strong fit for the model. The RMSEA was 0.0. Table 13 provides a summary of all fit indices, and Figure 3 provides the path diagram of the final model. Cronbach's coefficient alpha for the four items in the model was .86.

Table 13. Summary of fit indicators for confirmatory factor analysis for the EPSI identity subscale.

| Models | $\chi^2$ | df | p | $\chi^2$/df | RMSEA | GFI | AGFI | CFI |
|---|---|---|---|---|---|---|---|---|
| 1. EPSI identity subscale as a one-factor four-item model | .46 | 2 | .79 | .23 | 1.0 | 1.0 | 1.0 | 1.0 |

*Note*. RMSEA = root mean square error of approximation; GFI = goodness of fit index; GFI = adjusted goodness of fit index; CFI = comparative fit index.

## Regression Analysis

### *EPSI identity subscale scores and importance of communication factors*

Regression analyses were conducted to examine the relationships between the Performative-Importance and Social Network-Importance factor scores, and the ESPI identity subscale scores. Bivariate correlations of the data were evaluated and all were less than +/-.70, indicating a low probability of collinearity (Pearson, 2010).

Together, the Performative-Importance and Social Network-Importance factors accounted for a significant portion of the variance in subjects' identity development, $F(2, 593) = 5.66, p < .01$, with $R^2 = .02$. However, since Social Network-Importance produced a non-significant regression coefficient, $B = .006, \beta = .007, t\ (595) = .177, p = .86$, it was removed and another regression analysis was conducted. The final regression analysis

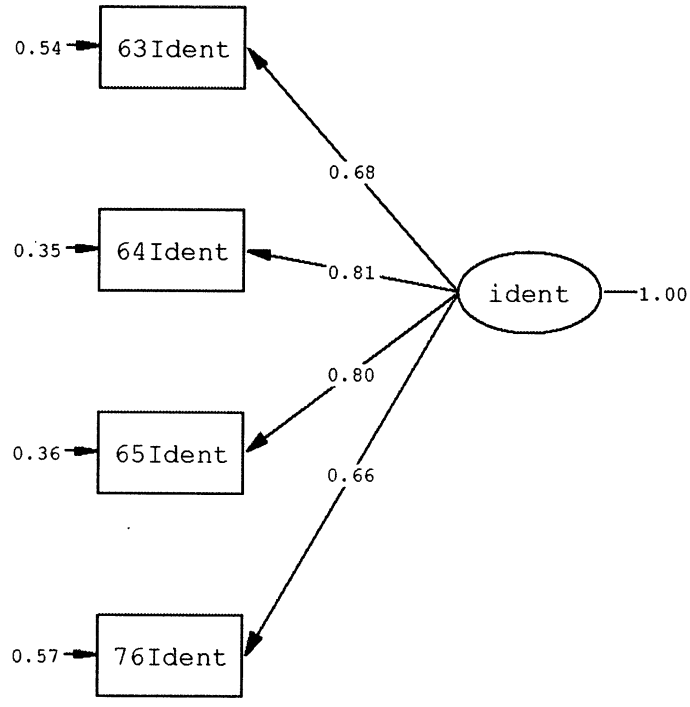


Figure 3. One-factor four-item confirmatory factor analysis model for the EPSI.

conducted accounted for a small but statistically significant portion of the variance in ESPI scores, $F(1, 594) = 11.31, p < .01$, with $R^2 = .02$. These results indicate that placing greater importance on performative online communication activities was predictive of lower scores on the four-items EPSI identity subscale, $\beta = -.137$, $t(595) = -3.36, p < .01$.

*EPSI subscale scores and frequency of communication factors*

Multiple regression analyses were conducted to examine the relationships between the Social Network-Frequency and Performative-Frequency factors and EPSI identity subscale scores. Together, Social Networking-Frequency and Performative-Frequency

factors accounted for a small but statistically significant portion of the variance in subjects' EPSI scores, $F(2, 596) = 3.05, R^2 = .01, p < .05$. However, since the impact of the Social Network-Frequency factor was not significant, $\beta = -.063, t\ (598) = -1.55, p = .122$, the regression was run again with that factor omitted.

The final regression equation was close to being significant at the $p < .05$ level, $F(1, 597) = 3.68, R^2 = .01, p = .056$. However, in spite of the marginal significance of this result, it was consistent with the previous results in that it did indicate more frequent performative activities were predictive of lower scores on the EPSI identity subscale, $\beta = -.08, t\ (597) = -1.92, p = .056$.

*EPSI identity subscale scores and importance of communication activities*

Multiple regression analyses were conducted to examine the relationships between the reported importance of communication activities and EPSI identity subscale scores. Initially, the four items that made up the Social Network-Importance factor were analyzed together and using stepwise regression. None of the models or the individual activities accounted for any statistically significant portion of the variance of identity development scores. Similar results were obtained when data were analyzed only for users of the relevant communication activities.

The four items that constitute the Performative-Importance factor were analyzed together and using stepwise regression to evaluate any relationship they might have to identity development. The reported importance of virtual environments like Second life was the only statistically significant predictor of identity development, both among all

subjects and among users of that technology. Among all subjects, the regression equation was statistically significant, $F(1, 598) = 10.87, R^2 = .02, p < .01$, indicating that the importance placed on virtual activities was a negative predictor for levels of identity development, $\beta = -.13, t\ (599) = -3.30, p < .01$. Among users of the technology, the equation showed similar directionality, $F(1, 242) = 8.77, R^2 = .04, p < .01$, also indicating that the value placed on virtual activities is a minor negative predictor of levels of identity development, $\beta = -.19, t\ (243) = -2.97, p < .01$.

Correlations were also examined to determine which activities were related to identity development. Face-to-face communication ($r = .14$) and voice calls via cellular or wired phone ($r = .13$) were positively correlated at the $p < .01$ significance level. The use of virtual environments ($r = -.13$), live chat with strangers ($r = -.13$), and live chat with groups ($r = -.13$) were both negatively correlated at the $p < .01$ significance level. Writing blogs ($r = -.08$) was negatively correlated at the $p < .05$ significance level.

Together, the importance of voice calls and virtual environments accounted for a small but statistically significant portion of variance in identity development scores among users of those technologies, $F(2, 247) = 8.14, R^2 = .06, p < .01$, with the importance of voice calls having a positive predictive relationship to identity development, $\beta = .18, t\ (249) = 2.90, p < .01$, and the importance of virtual environments having a negative relationship to identity development, $\beta = -.17, t\ (249) = 2.79, p < .01$.

Among all subjects, three items together demonstrated a statistically significant relationship to identity development, $F(3, 594) = 8.79, R^2 = .04, p < .01$. A positive

predictive relationship toward identity development was observed between the more traditional communication activities of face-to-face interaction, $\beta = .08, t\ (597) = 2.02, p < .05$ and the voice phone calls, $\beta = .12, t\ (597) = 2.83, p < .01$, and a negative predictive relationship to identity development was observed for the importance of live chat with a stranger, $\beta = -.13, t\ (597) = -2.13, p < .01$.

*EPSI identity subscale scores and frequency of communication activities*

The individual communication activities that made up the Social Network-Frequency and Performative-Frequency factor were analyzed using stepwise regression to determine whether any relationships existed to identity development status. None of the items demonstrated any statistically significant relationship to identity status when analyzing the data for users only. When analyzing the data for all subjects, a small but significantly significant relationship was identified, $F(1, 602) = 4.32, R^2 = .01, p < .05$, with frequency of live chat with a stranger as negative predictor of identity development, $\beta = -.08, t\ (603) = -2.08, p < .01$.

Correlations were also examined and the frequencies of several activities were determined to have statistically significant relationships to identity development at the $p < .05$ significance level. Face-to-face communication ($r = .09$), voice calls via cellular or wired phone ($r = .09$), and e-mail ($r = .09$) were positively correlated to identity development status. Posting personal updates on social networking sites ($r = -.08$), viewing profiles of others on a social networking site ($r = -.08$), and live chat with strangers ($r = -.08$) were both negatively correlated with identity development status.

Among those who used these communication forms that were correlated to identity development scores, regression analysis identified no statistically significant relationships between the frequency of communication activities and identity development. When analyzing data for all subjects, a statistically significant relationship was identified, $F(5, 594) = 5.60, R^2 = .05, p < .001$, with frequency of face-to-face communication, $\beta = .08$, $t\,(599) = 2.06, p < .05$, voice phone calls, $\beta = .09, t\,(599) = 2.21, p < .05$, and e-mail use, $\beta = .11, t\,(599) = 2.51, p < .05$, as positive predictors of identity development, and the frequency of viewing profiles of others on social networking sites, $\beta = -.12, t\,(599) = -2.98$, $p < .05$, and live chat with a stranger, $\beta = .10, t\,(599) = -2.39, p < .05$, as negative predictors of identity development status.

# CHAPTER FIVE. DISCUSSION

The purpose of this study was to better understand the communication activities preferred by adolescents and emerging adults, and how those activities related to their identity development status. Central to this developmental process is identity exploration, which is necessary for healthy psychosocial development. Online communication provides an ideal and popular mechanism for this process (Subrahmanyam & Smahel, 2011). What has been lacking in the literature is an in-depth exploration of what communication activities young people were using for identity development in electronically mediated settings. This study sought to address that question by evaluating empirically what new college students were actually using for identity development and what tools they considered important for that purpose. In the following chapter, the answers to each of the questions proposed in this study are addressed, as well as the limitations of this study and directions for future research.

## Research Question 1

The first question asked in this study was "What commonalities exist across the importance that adolescents attach to certain communication activities that would indicate preferences toward the use of certain communicative behaviors for identity exploration?" Young people choose the media that best allow them to accomplish their communication goals, including the task of identity exploration (Wolfradt & Doll, 2001). This question sought to identify those communication activities that were perceived as more or less valuable for young people to interact with others, and more importantly this question

sought to distinguish particular commonalities between the communication activities used for identity development purposes.

Initially, descriptive statistics were analyzed to determine the importance that subjects attached to the communication activities addressed in this study. Among individuals who used the communication activities addressed in this study, five items were reported as more important than the overall mean for all activities: face-to-face interaction, phone calls, text messaging, e-mails, and live chat on a social networking site. These same five items were ranked as most important among all subjects as well. The first four of these are not surprising. Young people are certainly heavier users of text messaging than other age groups (Nielsen Company, 2008), but generally these four communication forms represent the methods that many individuals use for practical daily activities. In this regard, such activities may be used for identity exploration but they are not unique to young people nor are they specialized in their ability to facilitate identity exploration.

The fifth activity, live text chat within a social networking site, may serve a primarily utilitarian function since it occurs within a bounded social group, is relatively sparse in terms of media richness, and is ephemeral in nature. What is remarkable about the high importance of this communication activity is that it is a specific form of interaction that only occurs within certain Web sites and that it functions only when individuals communicating are simultaneously online. In spite of these limitations, it ranks in the top five most important communication activities among young people in this study. Live chat in a social networking site is not necessarily a tool for identity exploration; however, the

placement of this utilitarian technology among the most important communication activities does indicate the high level of importance and apparently the frequent use of social networking sites by adolescents.

The importance of social networking sites is further supported by the fact that the next four items — viewing profiles, posting personal updates, updating a profile, and sharing content — which were ranked as important by users and all subjects alike, were all activities accomplished from within social networking sites. These activities are all above the overall mean for all activities among all subjects. The only social networking activities that did not appear above the mean in importance were using applications and games within a social networking site, which ranked 11$^{th}$ in importance among all subjects. In spite of the overall popularity of social networking sites, the low placement of applications and games is likely due to the fact that these activities tend to have small but dedicated groups of users (Nazir, Raza, & Chuah, 2008). What is also notable about the four social networking activities mentioned above is that they constitute the Social Network-Importance and Social Network-Frequency factors identified in this research. This indicates that not only are these activities important individually, but that they tend to be used in concert with one another.

Aside from live instant messaging from a computer program, the remaining seven items were all below the mean in importance for all subjects and for users of these communication activities. These communication activities took two primary forms. Written communication was the key focus of posting blogs, responding to blogs, and posting to

discussion boards. While expressive in nature, these communication activities do not necessarily offer opportunities for identity exploration. However, identity exploration is an activity that is easily accomplished using the four activities ranked lowest in importance: chat with strangers, chat with groups of strangers, playing online interactive games, and participating in virtual online environments.

In summary, the descriptive statistics indicated four primary groupings of communication activities based on their importance. Utilitarian communication activities were rated as most important, which is not surprising given the significance these activities likely have for school, work, and coordination of social activities. These are followed by social networking activities, which focus on creating a lasting presentation of self within a defined group of friends, family and acquaintances (Hogan, 2010). As such, these communication activities are consistent with the practice of identity exploration. Low rankings of importance were assigned instant messaging and written word activities, which are not typically used for identity exploration. The items with the lowest rankings were the performative activities that either involve chat with strangers or interaction in live virtual and game environments. In spite of their low ranking, these items do enable highly manageable presentation of self, which provide significant opportunities for identity exploration.

Correlations between the importance assigned to different communication activities showed commonalities that are consistent with the rankings identified in the descriptive statistics. Strong correlations were observed between activities performed on social

networking sites. The implication of these relationships is that those individuals who use social networking tend to embrace certain activities together. A second group of communication activities that showed strong correlations were live online activities such as online interactive gaming, online virtual activities, and chat with individual strangers and groups of strangers. This is not to say that these live activities were important; the overall means for the importance of these activities were low, indicating that adolescents consistently reported less value for these activities.

Correlations were also observed between written communication activities such as writing blogs, responding to blogs, and posting to discussion boards. Additionally, these written word activities were correlated with live performative activities. The correlation of written and live activities indicates commonalities in how young people *value* these activities, but it does not necessarily indicate that young people's preferences toward these communicative behaviors are driven by a common goal. Indeed, research suggests that live activities such as online games, chat, and virtual interaction, which occur at a given time, are fundamentally different from activities like blogging, which create a lasting artifact of self-expression (Hogan, 2010; O'Brien, 2000). In summary, analysis of the correlations between the individual activities in the importance of use data affirmed the two groupings of identity development-related activities observed in the descriptive statistics.

Results for the exploratory and confirmatory factor analyses related to the importance of communication activities indicated two clear factors evident in the data, which were titled Performative-Importance and Social Network-Importance. These two factors are

consistent with the relationships between communication activities identified using the descriptive statistics and correlations. The Social Network-Importance factor comprised four items: posting personal status updates, updating a personal profile, sharing content, and viewing the profiles of others. The Performative-Importance factor comprised four items: using virtual environments, playing online interactive games, live chat with strangers, and live chat with groups of strangers.

The first research question was built on some important assumptions. First, that young people *perceive* that certain communication activities are better able to achieve specific outcomes than others. The focus of this research was what media young people embraced or rejected as a function of their identity development needs. Second, this study sought to determine whether there would be some sort of consistency in the communication choices of young people. For this reason, the question was posed in terms of importance. Not all communication choices are optional. Individuals of all ages may be compelled to use different technologies by social, occupational, educational, or institutional requirements. The intent of this question was to find out what communication activities the subjects of this study preferred, rather than what they were obliged to use.

These assumptions were largely supported by all of the analyses performed. Young people tended to rank as most important those communication activities that are largely utilitarian in nature – face-to-face interaction, phone calls, text messaging, and e-mail. These communication activities are important simply because they are so widely used that

they are essential for modern life, regardless of whether young people use these for identity exploration.

The second group of activities, which were identified as important to adolescents in the descriptive statistics and as interrelated by the correlations and factor analyses, are social networking activities. Six social networking activities were addressed in this study, but four of them appear together consistently throughout this research: updating personal status messages, viewing the profiles of others, updating a personal profile, and sharing content with others. What is notable is that viewing profiles is not a deliberately expressive communication activity. However, it consistently ranked with the other more interactive behaviors. Because social surveillance is an important part of identity exploration, the presence of viewing profiles alongside other social networking activities — both in terms of importance and in the factor analysis — lends support to the use of social networking sites as a platform for identity exploration.

A third type of communication activity involved performative activities that emphasized a more "on stage" presentation of self that was evident in two primary forms: live online chat that tended to occur among strangers or groups of strangers, and participation in online virtual settings such as interacting in virtual "worlds" such as Second Life or playing online games. One would assume that these types of activities would be ideal for individuals who were highly invested in exploring different identities and expressions of self. That did not seem to be the case. In fact, these activities were typically ranked together as the least important means of communication for adolescents.

At first glance, one would assume that live activities group together simply because they are unimportant. They certainly share that characteristic. However, the regression analyses conducted as part of this research indicate that the reported importance of these activities has an inverse relationship to identity development status. (Similar results were observed regarding the frequency of these activities and identity development.) This relationship is small, but is did appear fairly consistently across the various analyses performed. First, the factor scores for the Performative-Importance factor accounted for a small portion of variance in identity development scores, with importance on performative activities having a negative relationship to identity development. Similar relationships were observed between identity development status and the importance of online virtual environments like Second Life, and between identity development status and live chat with strangers. Consequently, these activities do indeed relate to identity development, in spite of the fact that the individuals who participated in this research found them unimportant.

The answer to the first research question of this study is that the levels of importance assigned to various communication activities indicate that there are two types of activities that are related to identity development. The first type of communication activities comprise social networking activities that involve identity expression, as well as interpersonal interaction and surveillance within the confines of a community of managed cohorts. These activities are reported as important by subjects and are consistent with the behavior expected of those in the process of identity exploration and commitment.

However, the reported importance of these activities did not demonstrate any meaningful relationship to identity development status as measured in this research.

The second group of activities identified in this research provide participants with opportunities to explore identity in ways that are consistent with human development theories. The importance of these activities does show some slight relationship to identity development status. However, these activities are consistently ranked as unimportant. This likely indicates that for individuals in the early college years, performative activities tend to be viewed as less essential to their developmental needs. This may be due to the fact that they have outgrown these sorts of role-playing activities, that they have less dramatic or technologically driven opportunities for identity exploration, or even that economic or cultural norms may steer some young people away from these activities.

## Research Question 2

The second research question addressed in this study was, "What commonalities exist across the frequency of communication activities reported by adolescents that would indicate preferences toward the use of certain communicative behaviors for identity exploration?"

Descriptive statistics indicated similar results for frequency of various activities as it did for importance of those activities. Once again, the most frequently used activities tended to be utilitarian activities that are commonly used for practical daily responsibilities. These are followed closely by activities accomplished within social networking sites. All social networking activities were used more frequently than the overall mean except using

applications and games from within a social networking site. This is consistent with research indicating that such activities tend to be popular with a small portion of social networking site users.

In comparing the descriptive statistics for importance and frequency of communication activities, a few minor differences were noted among those activities that were more important than the mean. Text messaging ranked higher in frequency than it was in importance. This is consistent with observations that text messaging tends to be used more frequently by young people to send short messages. E-mail was also ranked lower in frequency than it was in importance. This is also consistent with research indicating that young people tend to find e-mail important for certain utilitarian purposes, but that they tend to use it less frequently than other communication activities.

Communication activities used less frequently than the mean were the same as those rated less important than the mean. In addition to social networking games and applications, and instant messaging, the items used less frequently overall appeared sequentially in two groups: written activities (blog writing, responding to blogs, discussion boards), and live performative activities (playing live interactive games, using online virtual environments, and chatting with strangers and groups of strangers). This latter group was rated as least important overall.

Factor analysis was conducted on the data related to frequency of communication activities, and two clear factors were identified that were essentially identical to the factors identified for the importance-of-use data. The Social Network-Frequency factor comprised

four items, all of which were also part of the Social Network-Importance factor. Similarly, the Performative-Frequency factor comprised the same four items as the Performative-Importance factor. The discussion related to the previous research question outlines many of the broad interpretive issues related to these two factors. What is notable is the reappearance of similar factors across both scales, reflecting exhibitive and performative online activities.

In summary, the answer to the second research question is this: the frequency of use data indicate that there are two primary types of activities for identity development purposes — social networking activities and performative activities. Social networking activities occur on Web sites such as Facebook, and produce a lasting presentation of self. This factor comprises four items related to the creation of durable artifacts. One item, viewing the profiles of others, does not directly create an artifact; however, because identity exploration involves not only experimentation, but social mirroring (Suarez-Orozco, 2000), this activity would be important to constructing online presentations of self. Overall, social networking activities are used more frequently than the mean for all activities addressed in this research, but not as frequently as utilitarian activities such as text messaging, face-to-face interaction, e-mailing, or phone calls.

The second group of communication activities related to identity exploration were the performative activities. These activities are notable because although they are consistent with the identity exploration behaviors described in human development theory, they are used less frequently than all other communication activities addressed in this research. Part

of this may be due to the fact that less the half of the individuals in this study reported even using these communication activities. However, even among those who have used these activities they ranked as less important and were less frequently used. As noted earlier, in spite of their lack of importance and popularity, these activities do have some relationship to identity development. That relationship is described in the answers to the final two research questions.

## Research Question 3

The third research question for this study asked, "How is the identity development status of adolescents related to the importance they attach to the various forms of communication they use?" To answer this question, regression analysis was conducted to determine relationships between the importance-of-use factors and EPSI identity subscale scores. During the initial regression analysis the Social Network-Importance factor score was determined to be statistically insignificant in the model and was removed from the analysis. The second regression analysis indicated that the Performative-Importance factor scores demonstrated a statistically significant but small negative relationship to identity development.

Multiple regression was also used to identify relationships between identity development and the individual communication activities that comprised the Social Network-Importance and Performative-Importance factors. Of the eight activities that constituted the two factors, only the importance of using virtual environments accounted for any of the variance in identity development scores. As with the Performative-

Importance factor, this negative relationship to identity development was statistically significant but small.

Finally, multiple regression was used to analyze the communication activities that demonstrated statistically significant correlations between importance of use and identity development. When analyzed together, results indicated that among users of the communication activities two items were related to identity development. The importance of virtual activities once again had a small inverse relationship to identity development status, and voice phone calls had a small positive relationship to identity development status. Among all subjects, the importance of live chat with strangers showed a small negative relationship to identity development; the importance of face-to-face communication and voice phone calls had a small positive relationship to identity development status.

The answer to the third research question is that performative activities tended to have a small negative relationship to identity development status. This was evident in the overall factor scores, as well as for participating in virtual environments and live chat activities. Items having a slight positive relationship to identity development status were voice phone calls and face-to-face communication. These more utilitarian communication forms were not clearly theorized as contributing to identity exploration; however, it may be that individuals who are more comfortable interacting with peers and rely more on these mundane communication activities are more advanced in the area of identity development.

## Research Question 4

The fourth research question addressed in this study was "How is the identity development status of adolescents related to the frequency with which they use various forms of communication?" To answer this question, regression analysis was conducted between the frequency-of-use factor scores and the EPSI identity subscale scores. Results indicated a small, marginally significant negative relationship between performative activities and identity development.

Regression analyses were also conducted to analyze the relationships between the eight individual communication activities that constituted the two factors and identity development scores. Across all of these items, only live chat with a stranger had a statistically significant relationship to identity development. Once again, the reported frequency of this performative activity was found to have a negative predictive relationship to identity development.

Finally, the individual communication activities that showed statistically significant correlations between frequency of use and identity development scores were analyzed. No statistically significant relationships were identified for the frequency of any communication activities and identity scores when data were analyzed for users only. Among all subjects, regression analyses showed a small negative predictive relationship between the frequency of live chat with a stranger and identity development. A small positive predictive relationship was identified between identity development scores and the

following items: the frequency of face-to-face communication, the frequency of voice calls, and the frequency of e-mail use.

A slight *negative* relationship was identified between the frequency of viewing social networking profiles and identity development status; however, since this relationship is small and was not observed in any of the other data analyses, it may be an anomaly. Alternatively, it may suggest that those who experience identity diffusion or are not yet ready to begin identity exploration may look to others for behavioral cues. Such findings would be consistent with human development theory, but are outside the scope of this research.

The answer to the fourth research question is that slight negative relationships are evident between performative activities and identity development status. Small positive relationships were also apparent between identity development status and the frequency of utilitarian activities such as face-to-face communication, phone calls, and e-mail. Performative activities have a clear theoretical connection to identity development. The positive relationship between face-to-face, phone calls, and e-mail is less clear. The relationship could be related to the fact that those who are farther along in their developmental status exhibiting more social interaction with a defined set of peers, rather than exploring identity by affiliating with different types of peer groups. Subrahmanyam and Greenfield (2008) found that online communication activities such as these are becoming more popular in recent years among adolescents to coordinate and support their offline activities among existing friends and romantic partners; however, no clear

relationship between identity development and these specific communication activities was identified in the literature reviewed for this research.

## Summary of Study Results

Although the findings of this research do not demonstrate strong relationships between any of the communication activities addressed and identity development, the small relationships identified appear with regularity and are consistent with theories regarding identity development in adolescence. Taken together, the findings indicate that the importance and likelihood of engaging in the performative activities addressed in this research is negatively related to identity development. The strength of these relationships is small, and may be due to the fact that most of the performative activities were not only rated as important nor were they frequently used by the individuals selected to participate in this study.

There is also some indication that individuals who communicate more frequently and report greater importance in face-to-face communication and phone calls show greater identity development status. Since identity exploration requires more control of the presentation of self, individuals who have progressed from identity exploration to identity commitment may be more likely to use face-to-face interaction and voice calling because those communication forms are more spontaneous and interpersonal, and tend to occur more frequently with those individuals with whom the subject has established a relationship and a clear identity.

The factor analysis portion of this research, which evaluated relationships between communication activities, produced enlightening and meaningful results. Because the factor analysis for both importance-of-use and frequency-of-use scales produced similar results, the latent constructs related to identity development — performative behavior and exhibition of artifacts — bear further analysis. What is most challenging about the factors identified was that they lacked robustness. The performative factor and the items it comprised were certainly clear and distinct. Unfortunately, they were also the least used and least important activities identified in this research. Better understanding of what needs these activities fulfill and how young people use them will require analysis of a population that is more heavily engaged in these activities.

Similarly, social networking activities showed strong importance and frequency of use – and correlations and the factor analyses showed that these items were used collectively. However, these activities showed no relationship to identity development, even though these sites provide ideal opportunities for identity exploration and commitment. This may indicate that the popularity of social networking sites such as Facebook and Myspace has made these technologies a necessity to social interaction, rather than indicative of users' individual communication preferences or developmental status. Analysis of how social networking sites are used at various stages of adolescence and emerging adulthood may offer further clues to whether the presentation of self that is facilitated on these sites is reflected in the identity development process.

In summary, this research indicates that there are distinct patterns of communication technology use and perceived importance that are related to the tasks of identity exploration. Among the individuals surveyed in this research, performative online activities were far less important and less frequently used, but results indicate that together they form a distinct type of communication. Social networking activities were important with the individuals who participated in this research; however, while the use of these activities to observe others and create a personal exhibition of the self is consistent with identity exploration and commitment, a clear relationship between this communication activity and identity development status was not identified. Taken together, these findings indicate that young people are using certain activities for the identity development purposes and that they prefer certain activities to others in order to accomplish those goals.

## Limitations and Future Research Directions

There were several limitations in the instruments and the data used in this research. First, although the taxonomy of items used for the importance and frequency measures was generally robust and provided useful insights, this study may have benefited from a more structured approach to defining these items. At the same time, it could be argued that even with a protracted and carefully measured approach to building a list of current communication activities, the complexities and rapid changes in technology would produce a scale that is highly subjective and obsolete before it is published.

One of the significant limitations of this research was the use of the EPSI identity subscale as the sole measure of identity development. Given the solid theoretical

foundations of this scale and its frequent use in other contexts, lack of validity of the majority of items in this instrument was less than desirable. Additionally, the ESPI identity development subscale is unidimensional and therefore may not provide an adequate insight as a stand-alone measure for this type of research. At the same time, this study captured data from young people at a particular moment in time. It is possible that the population studied were relatively homogenous in their identity development status at the time the data were collected. Since identity development continues into emerging adulthood, their developmental status may not have been advanced enough to be clearly evident using this particular instrument.

An instrument that measured both identity exploration and identity commitment would have provided more granular options for this analysis. This is important because identity development entails both exploration of possible roles and commitment to a certain identity (Marcia, 1966). The use of a bifurcated instrument may have allowed closer analysis of which communication activities were more closely related to identity exploration and which were more indicative of identity commitment. In particular, consideration of how performative and exhibitive activities relate to identity exploration and commitment could be valuable. The nature of performative and social networking activities suggests that the former is more indicative of identity exploration and the latter more indicative of identity commitment.

Several limitations also impacted the quality of the data. Because the opportunity to collect a large, representative sample arose early in the research process, the population

selection was not as rigorous as it might have been. As the research project moved forward and additional literature was reviewed, it became apparent that the identity development status of the population sampled may not have been as well defined as it would have been for slightly older populations. Research certainly indicates that those between 18 and 20 are in the process of identity development. However, research on emerging adulthood (Arnett, 2004, 2006) would indicate that first-year college students are not as likely to have reached the commitment stage in the identity development process, and therefore their identity status was not as evident as it might have been later in their lives.

Future research in this area has the potential to extend the findings identified in this study. A similar analysis using a more refined identity development scale and revised taxonomy of communication activities could certainly expand the findings presented here. In particular, an awareness of performative and exhibitive online activities could also inform the types of scales used to measure of identity development as it relates to online communication.

Finally, future research could extend this study by beginning with subjects who use the relevant communication activities identified here. An in-depth analysis of the individuals who are more engaged with performative activities may provide further clarification on whether these individuals embrace such role-playing to fulfill a developmental need for identity exploration. Similarly, analysis of social networking

activities across various age groups may provide greater insight into whether identity development plays a role in the use of these exhibitive communication activities.

## Conclusion

The pursuit of an exploratory study is always a tenuous undertaking. In the case of this research, there was little extant literature to connect specific online activities and identity development. Those studies that had been conducted on the topic had largely treated Internet use as monolithic. The goal of this study was to take an ipsative approach to this topic by evaluating the actual communication activities of young people, rather than simply considering "Internet use." This study was not able to distinguish a strong connection between identity development statuses and communication preferences of young people. However, it did make a contribution to the existing research by identifying preferences toward to types of identity-related communication activities.

In May 1995, 14% of Americans used the Internet. By May of 2010, that number had grown to 79% (Pew Internet, n.d.). At no point in history has a single medium of communication been embraced at such a rapid rate. As digital communication channels continue to proliferate, understanding how these tools impact developmental processes of young people will be an important area of ongoing research. Such studies will need to be dynamic and responsive to the rapidly changing social and technological landscape. Indeed, studies conducted using static measures and methodologies may be obsolete and inaccurate before they see publication. It will be incumbent upon human development researchers and communication scholars to remain engaged with advances in the area of communication

technology in order to adequately measure its impact on young people, on human development, and ultimately upon society.

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# APPENDIX A. TYPES OF INTERNET USE IDENTIFIED BY PEW INTERNET

The following describes types of Internet activities reported by respondents to surveys conducted by the Pew Internet and American Life project between March 2000 and December 2009 (Pew Internet, 2009.) The list has been divided into two sections to more easily identify which items were used in this research, and to describe how the items were repurposed for use in this scale. Items in the second section were primarily excluded because they make no reference to interpersonal interaction or presentation of self.

*Items used in this research*

| **Item from Pew list** | **Communication activity variable from this research (Survey question numbers)** | **Comment** |
|---|---|---|
| Categorize or tag online content like a photo, news story or blog post | Import_PostContent (12), Freq_PostContent (30) | With the decline of social categorizing/tagging (i.e., bookmarking), "social networks replaced social bookmarking sites" for posting and sharing content with other people (Agarwal, 2009, para. 2). |
| Chat in a chat room or in an online discussion | Freq_LiveChat (9), Freq_StrangerChat (21), Freq_GroupChat (22), Import_LiveChat (27), Import_StrangerChat (39), Import_GroupChat (40) | Subdivided into group chat, and also by chatting with friends or strangers. |
| Create or use an avatar or online graphic representation of yourself, for example, in a virtual world such as Second Life | Freq_2ndLife (19), Freq_Warcraft (20), Import_2ndLife (37), Import_Warcraft (38) | Subdivided into purposive (i.e., game) and social virtual environments (Wagner, Rachael, 2009) |

| | | |
|---|---|---|
| Create or work on your own online journal or blog | Freq_BlogWriting (17), Import_BlogWriting (35) | |
| Create or work on your own Web page | Freq_UpdProfil (11), Freq_ShareCont (12), Import_UpdProfil (29), Import_ShareCont (30), | Questions 12 and 30 include content other than pictures. Added social networking profile since "your own Web page" implies posting of personal content on the Web. |
| Participate in an online discussion, a listserv, or other online group forum that helps people with personal issues or health problems | Freq_DiscBoard (16), Import_DiscBoards (34) | Removed reference to specific content (i.e., personal issues or health problems) |
| Play online games | Freq_Warcraft (20), Import_Warcraft (38) | |
| Post comments to an online news group, website, blog or photo site | Freq_BlogRespond (18), Import_BlogRespond (36) | |
| Send instant messages | FreqIM (08), Freq_IM (26) | |
| Send or read e-mail | Freq_Email (15), Import_Email (33) | |
| Send or receive text messages using a cell phone | Freq_Txt (07), Import_Txt (25) | |
| Upload photos to a website so you can share them with others online | Freq_ShareCont (12), Import_ShareCont (30) | |
| Use an online social networking site like MySpace, Facebook or LinkedIn.com | Frequency questions 9-14, and 27-32 | |
| View live images online of a remote location or person, using a webcam | Freq_StrangerChat (21), Freq_GroupChat (22), Import_StrangerChat (39), Import_GroupChat (40) | Removed "remote location" since this was not an interpersonal activitity. |

*Items not used in this research*

Buy a product

Buy or make a reservation for travel

Buy or sell stocks, bonds, or mutual funds

Check the weather

Create content for the internet

Create or work on web pages or blogs for others, including friends, groups you belong to, or for work

Do any banking online

Do any type of research for your job

Download a podcast so you can listen to it or view it later

Download computer games from the internet

Download computer programs from the internet

Download music files to your computer

Download or share adult content online

Download or share files using peer-to-peer file-sharing networks, such as BitTorrent or LimeWire

Download other files such as games, videos, or pictures

Download other files such as games, videos, or pictures

Download screensavers from the internet

Download video files to your computer

Get financial info online, such as stock quotes or mortgage interest rates

Get info online about a college, university or other school you or a family member might attend

Get news

Get sports scores and info online

Get travel info

Go to a Web site that provides info or support for a specific medical condition or personal situation

Listen to a live or recorded radio broadcast online, such as a newscast, sporting event, or radio show

Listen to music online at a website

Log on to the internet using a wireless device

Look for "how-to," "do-it-yourself" or repair information

Look for health medical info

Look for info about a place to live

Look for info on a hobby or interest

Look for information on Wikipedia

Look for information online about a service or product you are thinking of buying

Look for religious/spiritual info

Look online for info about a job

Look online for news or information about politics or the upcoming campaigns

Look up phone number or address

Make a donation to a charity online

Participate in an online auction

Pay bills online

Pay to access or download digital content online

Post a comment or review online about a product you bought or a service you received

Rate a product, service or person using an online rating system

Read someone else's online journal or blog

Research for school or training

Research your family's history or genealogy online

Search for a map or driving directions

Search for info about someone you know or might meet

Sell something online

Send or receive an invitation to a meeting or party using an online invitation service

Share files from own computer with others

Surf the Web for fun

Take a class online for credit toward a degree of some kind

Take a class online just for personal enjoyment or enrichment

Take a virtual tour of a location online

Take material you find online like songs, text or images and remix it into your own artistic creation

Use a search engine to find information

Use an online dating Web page

Use online classified ads or sites like Craigs list

Visit a local, state or federal government website

Visit an adult Web page

Watch a video clip or listen to an audio clip

Watch a video on a video-sharing site like YouTube or Google Video

# APPENDIX B. ERIKSON PSYCHOSOCIAL STAGE INVENTORY

The EPSI is administered by presenting the items below in random order to subjects, who are asked to respond to each statement using a five-point Likert-type scale ranging from "almost always true" (5) to "hardly ever true" (1). The mean for each of the subscales indicated below provide the score for that developmental area. (Rosenthal, Gurney, & Moore, 1981)

*Trust*

3. I wish I had more self-control*

12. I find the world a very confusing place*

19. I worry about losing control of my feelings*

20. I have few doubts about myself

24. Other people understand me

31. I find that good things never last long*

36. Things and people usually turn out well for me

38. I think the world and people in it are basically good

42. People are out to get me*

47. I find myself expecting the worst to happen*

53. I'm as good as other people

64. I trust people

*Autonomy*

1. I am able to take things as they come

2. I can't make sense of my life*

5. I can't make up my own mind about things*

8. I'm never going to get on in this world[1]*

13. I know when to please myself and when to please others

28. I really believe in myself

39. I am ashamed of myself*

54. I like to make my own choices

55. I don't feel confident of my judgment*

62. I can stand on my own two feet[2]

63. I find it hard to make up my mind*

65. I like my freedom and don't want to be tied down

*Initiative*

7. I am able to be first with new ideas

16. I don't seem to have the ability that most others have got*

21. I rely on other people to give me ideas*

23. I think I must be basically bad*

26. I feel guilty about many things*

34. I'm an energetic person who does lots of things

46. I can stop myself doing things I shouldn't be doing

---

[1] Arehart and Smith (1990) wrote that this item should be reworded as "I'm never going to get anywhere in this world."

[2] Arehart and Smith (1990) wrote that this item should be reworded as "I can take care of myself" as suggested by Rosenthal et al. (1981).

50. I find myself denying things even though they are true*

57. I cope very well

61. I'm a follower rather than a leader*

66. I like new adventures

69. I like finding out about new things or places

*Industry*

15. I don't seem to be able to achieve my ambitions*

22. I don't enjoy working*

25. I'm a hard worker

32. I feel I am a useful person to have around

35. I'm trying hard to achieve my goals

40. I'm good at my work

45. I can't stand lazy people

52. I waste a lot of my time messing about*

58. I'm not much good at things that need brains or skill*

60. I stick with things until they're finished

68. I don't get things finished*

70. I don't get much done*

*Identity*

6. I change my opinion of myself a lot*

10. I've got a clear idea of what I want to be

11. I feel mixed up*

14. The important things in life are clear to me

17. I've got it together

18. I know what kind of person I am

29. I can't decide what I want to do with my life*

37. I have a strong sense of what it means to be female/male

43. I like myself and am proud of what I stand for

44. I don't really know what I'm on about[3]*

49. I find I have to keep up a front when I'm with people*

51. I don't really feel involved*

*Intimacy*

4. I get embarrassed when someone begins to tell me personal things*

9. I'm ready to get involved with a special person

27. I'm warm and friendly

30. It's important to me to be completely open with my friends

33. I keep what I really think and feel to myself*

41. I think it's crazy to get too involved with people*

48. I care deeply for others

56. I'm basically a loner*

---

[3] For this study, this item was reworded as "I don't really know where I'm headed in life" as suggested in Arehart and Smith (1990).

59. I have a close physical and emotional relationship with another person

67. I prefer not to show too much of myself to others*

71. Being alone with other people makes me feel uncomfortable*

72. I find it easy to make close friends

* Indicates reversed scale item

# APPENDIX C. SURVEY INSTRUMENT

**North Dakota State University**
**Communication Department**
**321 Minard Hall**
**Fargo, ND 58102**
**701-231-7705**

**NDSU RESEARCH STUDY:**
**Personal Identity and Online Communication Methods**

My name is Cloy Tobola, and I am a Ph.D. student in the Communication Department at North Dakota State University. I am conducting a research project to explore how college students view themselves and what types of communication forms they prefer. Through this study, I hope to learn more about the relationships between human development and electronic communication.

Because you are a first-year college student, you are invited to take part in this research project.

Your participation is entirely your choice, and you may change your mind or quit participating at any time, with no penalty to you. Your performance in this study or your refusal to participate or withdrawal from this study will in no way affect your class standing, grades, or status in athletics or other activities at North Dakota State University. There are no known risks associated with participation in this study.

The criteria for this study are that you must be 18 or older and an incoming NDSU student.

If you are willing to participate, please complete the attached questionnaire on your own. Be sure to read each section carefully and answer all questions honestly.

The survey involves questions about the types of communication you use, as well as your perceptions about yourself and your interaction with others. It will take approximately 10 to 12 minutes to complete this questionnaire. The survey is anonymous; you will not be asked to identify yourself in any way. This means that no one, not even the researchers, will know that the information you give comes from you.

If you have questions about this study, you can call me at 701-231-6108 or e-mail cloy.tobola@ndsu.edu. You may also contact my adviser, Dr. Paul Nelson, at 701-231-7705 or e-mail paul.nelson.1@ndsu.edu.

You have rights as a research participant. If you have questions about your rights or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program at 701-231-8908, ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept 4000, PO Box 6050, Fargo, ND 58108-6050.

Thank you for your participation in this research.

# Communication and Self Perceptions Survey

The purpose of this survey is to explore the ways that first-year college students use different types of communication and how they view themselves. Please answer each question as honestly as possible.

## Section A: Cell Phone Use

1. Please select the items that describe your cell phone use. (*Select all that apply.*)
   - ❑ I do **not** regularly use a cell phone for any purpose
   - ❑ I regularly use a cell phone for voice calls
   - ❑ I regularly use a cell phone to send or receive text messages
   - ❑ I regularly use a cell phone to send or receive e-mail
   - ❑ I regularly use a cell phone to access the Web or other online services.

## Section B: Internet Access

Indicate the type of Internet connections you typically used **before coming to NDSU.**

2. At home I typically used:
   - ❑ Dial-up Internet service (your computer calls an Internet service and hangs up when disconnecting)
   - ❑ High-speed Internet connection such as DSL, cable or dish network Internet access
   - ❑ I did not use the Internet at home

3. At school I typically used:
   - ❑ Dial-up Internet service (your computer calls an Internet service and hangs up when disconnecting)
   - ❑ High-speed Internet connection such as DSL, cable or dish network Internet access
   - ❑ I did not use the Internet at school

4. At other locations (the library, a friend's house) I typically used:
   - ❑ Dial-up Internet service (your computer calls an Internet service and hangs up when disconnecting)
   - ❑ High-speed Internet connection such as DSL, cable or dish network Internet access
   - ❑ I did not use the Internet at other locations

## Section C: Frequency of Communication

For each method of communication listed below, please circle the number to indicate how ***frequently*** you used each activity **before you came to NDSU,** compared to other means of communicating. Not everyone uses every communication form. Circle NA if you do not use a particular communication method.

5. Communicating face-to-face with others

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

6. Talking on the phone (cell phone or wired telephone) with others

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

7. Sending or receiving text messages from a cell phone

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

8. Sending or receiving instant messages using a computer program like Yahoo Messenger or iChat

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

9. Using live chat with another person while logged-in to a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

10. Posting a status message on a site like Facebook, MySpace or Twitter to tell others what you are thinking, feeling or doing right now

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

11. Creating or updating your personal profile on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

12. Posting pictures or other content (articles, jokes, videos) on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

13. Viewing or responding to profiles, pictures or content posted by others on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

14. Using applications (for example quizzes, playing games, or sending virtual "gifts") on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

15. Sending or receiving personal e-mail messages

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

16. Posting messages and responding to others using an online announcement or discussion board like Yahoo or Google Groups

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

17. Writing and posting a blog, online article or journal for others to see

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

18. Responding to a blog or other online article or journal posted by someone else

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

19. Using an online virtual space like Second Life that is not primarily a game

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

20. Playing an online interactive game like World of Warcraft with others

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

21. Participating in a live online chat (text or voice or video) with another person I have **not** met face-to-face

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

22. Participating in a live group discussion (text or voice or video) with a group of people I have not met face-to-face

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less frequently | | just as frequently as other ways of communicating | | much more frequently | I do not use this |

## Section D: Importance of Communication

For each method of communication listed below, please circle the number to indicate how ***important*** you feel it has been to interact with others or share information **before you came to NDSU**, compared to other means of communicating. Not everyone uses every communication form. Circle NA if you do not use a particular communication method.

23. Communicating face-to-face with others

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

24. Talking on the phone (cell phone or wired telephone) with others

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

25. Sending or receiving text messages from a cell phone

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

26. Sending or receiving instant messages using a computer program like Yahoo Messenger or iChat

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

27. Using live chat with another person while logged-in to a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

28. Posting a status message on a site like Facebook, MySpace or Twitter to tell others what you are thinking, feeling or doing right now

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

29. Creating or updating your personal profile on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

30. Posting pictures or other content (articles, jokes, videos) on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

31. Viewing or responding to profiles, pictures or content posted by others on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

32. Using applications (for example quizzes, playing games, or sending virtual "gifts") on a site like Facebook or MySpace

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

33. Sending or receiving personal e-mail messages

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

34. Posting messages and responding to others to an online announcement or discussion board like Yahoo or Google Groups

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

35. Writing and posting a blog or other online article or journal for others to see

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

36. Responding to a blog or other online article or journal posted by someone else

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

37. Using an online virtual space like Second Life that is not primarily a game

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

38. Playing an online interactive game like World of Warcraft with others

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

39. Participating in a live online chat (text or voice or video) with another person I have **not** met face-to-face

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

40. Participating in a live group discussion (text or voice or video) with a group of people I have not met face-to-face

| 1 | 2 | 3 | 4 | 5 | NA |
|---|---|---|---|---|---|
| much less important | | just as important as other ways of communicating | | much more important | I do not use this |

## Section E: Why You Use Cell Phones and Computers

People have different reasons for communicating electronically. For the items below, circle the number to indicate how often these statements are true regarding your reasons for using *computers or cell phones rather than communicating face-to-face.*

41. To feel less shy than I would in a face-to-face setting

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

42. To make new friends

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

43. To explore how others react to me

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

44. Because I dare to say more than I would in a face-to-face setting

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

45. To get to know people more easily than I could in a face-to-face setting

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

46. To try out how it is to be someone else

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

47. Because I can talk more easily than I could in a face-to-face setting

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

48. To get a date or relationship

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

49. Because I can think up how I will look

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

50. To talk more easily about certain topics than I could in a face-to-face setting

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

51. To get to know more people than I could in a face-to-face setting

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

52. So I can express different aspects of myself that others don't know about

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

## Section F: How You View Yourself

The questions below are about how you view yourself. For each item, circle the number from 5 to 1 that best indicates how true each statement is about you. The scale ranges from 5 ("almost always true") to 1 ("hardly ever true.")

53. I am able to take things as they come

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

54. I can't make sense of my life

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

55. I get embarrassed when someone begins to tell me personal things

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

56. I can't make up my own mind about things

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

57. I change my opinion of myself a lot

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

58. I'm never going to get anywhere in this world

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

59. I'm ready to get involved with a special person

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

60. I've got a clear idea of what I want to be

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

61. I feel mixed up

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

62. I know when to please myself and when to please others

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

63. The important things in life are clear to me

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

64. I've got it together

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

65. I know what kind of person I am

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

66. Other people understand me

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

67. I'm warm and friendly

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

68. I really believe in myself

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

69. I can't decide what I want to do with my life

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

70. It's important to me to be completely open with my friends

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

71. I keep what I really think and feel to myself

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

72. I have a strong sense of what it means to be female/male

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

73. I think the world and people in it are basically good

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

74. I am ashamed of myself

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

75. I think it's crazy to get too involved with people

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

76. I like myself and am proud of what I stand for

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

77. I don't really know where I'm headed in life

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

78. I care deeply for others

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

79. I find I have to keep up a front when I'm with people

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

80. I don't really feel involved

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

81. I like to make my own choices

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

82. I don't feel confident of my judgment

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

83. I'm basically a loner

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

84. I have a close physical and emotional relationship with another person

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

85. I can take care of myself

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

86. I find it hard to make up my mind

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

87. I trust people

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

88. I like my freedom and don't want to be tied down

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

89. I prefer not to show too much of myself to others

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

90. Being alone with other people makes me feel uncomfortable

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

91. I find it easy to make close friends

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| hardly ever true | | | | almost always true |

## Section G: Demographic Info

This survey is completely anonymous. We would appreciate it if you would complete the following demographic questions to allow for group comparisons.

While attending NDSU, I will live in the following residence hall:

- ❑ Burgum
- ❑ Churchill
- ❑ Dinan
- ❑ LLC East/West
- ❑ Niskanen
- ❑ Pavek
- ❑ Reed/Johnson
- ❑ Seim
- ❑ Sevrinson
- ❑ Stockbridge
- ❑ Thompson
- ❑ Weible

Before coming to NDSU, I lived in _____.

- ❑ a rural area or small town
- ❑ a larger town or suburban area
- ❑ a metropolitan area

Please indicate your level of comfort using technology (e.g., the Internet, computers).

- ❑ very comfortable
- ❑ comfortable
- ❑ neutral
- ❑ uncomfortable
- ❑ very uncomfortable

What is your age? _____

What is your sex:

- ❑ male
- ❑ female

With which ethnic group do your primarily identify yourself?

- ❑ African American
- ❑ American Indian
- ❑ Asian
- ❑ Hispanic
- ❑ White
- ❑ Other

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***This is the end of the survey. Thank you for your participation.***

# APPENDIX D. IRB APPROVAL

NDSU NORTH DAKOTA STATE UNIVERSITY

*Institutional Review Board*
*Office of the Vice President for Research, Creative Activities and Technology Transfer*
*NDSU Dept. 4000*
*1735 NDSU Research Park Drive*
*Research 1, P.O. Box 6050*
*Fargo, ND 58108-6050*

*701.231.8995*
*Fax 701.231.8098*

*Federalwide Assurance #FWA00002439*
*Expires April 24, 2011*

July 31, 2009 (corrected 3/7/2011)

Dr. Paul E. Nelson
Dept. of Communication
321 Minard Hall

**Re:** IRB Certification of Human Research Project:

**"How Identity Development Status Affects Choices of Electronic Media"**
Protocol **#HS10018**

Co-investigator(s) and research team: **Cloy Tobola**

Study site(s): **NDSU** Funding: **n/a**

It has been determined that this human subjects research project qualifies for exempt status (category # 2b) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*). This determination is based on the protocol form received 7/27/2009 and consent/information sheet received 7/29/2009.

Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the research after 7/30/2012, the IRB must re-certify the protocol prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is available on the IRB website.
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Any significant new findings that may affect the risks and benefits to participation will be reported in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB policies.

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,
Kristy Shirley
Kristy Shirley, CIP, Research Compliance Administrator

# APPENDIX E. MATRIX OF CORRELATIONS BETWEEN FREQUENCY OF COMMUNICATION ACTIVITIES AND EPSI IDENTITY SUBSCALE SCORES

| Variables | | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22†† |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPSI Identity Subscale Score† | *r* | .09* | .09* | -.00 | -.02 | .01 | -.08* | -.02 | -.02 | -.08* | -.06 | .09* | -.05 | -.03 | -.04 | -.07 | -.02 | -.08* | -.05 |
| | *n* | 605 | 604 | 604 | 603 | 604 | 604 | 603 | 604 | 602 | 604 | 604 | 604 | 604 | 604 | 605 | 605 | 604 | 604 |
| 05.Face-to-Face | *r* | — | .13** | .05 | -.02 | .09* | .07 | .07 | .08* | .07 | -.09* | .05 | -.05 | -.06 | -.05 | .01 | -.06 | -.02 | -.08* |
| | *n* | | 606 | 606 | 605 | 606 | 606 | 605 | 606 | 604 | 606 | 606 | 606 | 606 | 606 | 607 | 607 | 606 | 606 |
| 06.Phone | *r* | | — | .23** | .18** | .21** | .23** | .20** | .19** | .21** | .12** | .23** | .19** | .15** | .18** | .13** | .02 | .08 | .05 |
| | *n* | | | 606 | 604 | 605 | 605 | 604 | 605 | 603 | 605 | 605 | 605 | 605 | 605 | 606 | 606 | 605 | 605 |
| 07.TextMsg | *r* | | | — | .10* | .24** | .26** | .25** | .24** | .31** | .08 | .02 | -.03 | .01 | .00 | .03 | .00 | .03 | -.03 |
| | *n* | | | | 604 | 605 | 605 | 604 | 605 | 603 | 605 | 605 | 605 | 605 | 605 | 606 | 606 | 605 | 605 |
| 08.InstantMsg | *r* | | | | — | .31** | .19** | .20** | .15** | .16** | .23** | .25** | .36** | .35** | .36** | .33** | .24** | .36** | .30** |
| | *n* | | | | | 605 | 605 | 604 | 605 | 603 | 605 | 605 | 605 | 605 | 605 | 605 | 605 | 604 | 604 |
| 09.SocNetChat | *r* | | | | | — | .48** | .45** | .41** | .49** | .32** | .23** | .23** | .24** | .24** | .22** | .12** | .15** | .12** |
| | *n* | | | | | | 606 | 605 | 606 | 604 | 606 | 606 | 606 | 606 | 606 | 606 | 606 | 605 | 605 |
| 10.PersonUpdates | *r* | | | | | | — | .71** | .61** | .69** | .40** | .21** | .18** | .20** | .22** | .16** | .06 | .12** | .08* |
| | *n* | | | | | | | 605 | 606 | 604 | 606 | 606 | 606 | 606 | 606 | 606 | 606 | 605 | 605 |
| 11.UpdateProfile | *r* | | | | | | | — | .64** | .69** | .45** | .21** | .29** | .26** | .25** | .20** | .05 | .10* | .07 |
| | *n* | | | | | | | | 605 | 603 | 605 | 605 | 605 | 605 | 605 | 605 | 605 | 604 | 604 |
| 12.ShareContent | *r* | | | | | | | | — | .67** | .38** | .13** | .23** | .29** | .26** | .18** | .06 | .12** | .09* |
| | *n* | | | | | | | | | 604 | 606 | 606 | 606 | 606 | 606 | 606 | 606 | 605 | 605 |
| 13.ViewProfiles | *r* | | | | | | | | | — | .44** | .21** | .17** | .20** | .19** | .17** | .04 | .08* | .04 |
| | *n* | | | | | | | | | | 604 | 604 | 604 | 604 | 604 | 604 | 604 | 603 | 603 |
| 14.SocNetApps | *r* | | | | | | | | | | — | .23** | .35** | .34** | .32** | .30** | .15** | .22** | .16** |
| | *n* | | | | | | | | | | | 606 | 606 | 606 | 606 | 606 | 606 | 605 | 605 |
| 15.E-mail | *r* | | | | | | | | | | | — | .32** | .19** | .23** | .16** | .07 | .14** | .16** |
| | *n* | | | | | | | | | | | | 606 | 606 | 606 | 606 | 606 | 605 | 605 |
| 16.DiscBoards | *r* | | | | | | | | | | | | — | .69** | .64** | .57** | .35** | .46** | .50** |
| | *n* | | | | | | | | | | | | | 606 | 606 | 606 | 606 | 605 | 605 |
| 17.BlogWriting | *r* | | | | | | | | | | | | | — | .87** | .67** | .41** | .49** | .51** |
| | *n* | | | | | | | | | | | | | | 606 | 606 | 606 | 605 | 605 |
| 18.BlogRespond | *r* | | | | | | | | | | | | | | — | .60** | .38** | .47** | .50** |
| | *n* | | | | | | | | | | | | | | | 606 | 606 | 605 | 605 |
| 19.2ndLife | *r* | | | | | | | | | | | | | | | — | .55** | .56** | .56** |
| | *n* | | | | | | | | | | | | | | | | 607 | 606 | 606 |
| 20.OnlineGames | *r* | | | | | | | | | | | | | | | | — | .55** | .52** |
| | *n* | | | | | | | | | | | | | | | | | 606 | 606 |
| 21.StrangerChat | *r* | | | | | | | | | | | | | | | | | — | .72** |
| | *n* | | | | | | | | | | | | | | | | | | 605 |

†EPSI Identity Subscale uses only four items identified as valid. ††22.GroupChat. *Correlation significant at the .05 level. **Correlation significant at the .01 level.

# APPENDIX F. MATRIX OF CORRELATIONS BETWEEN IMPORTANCE OF COMMUNICATION ACTIVITIES AND EPSI IDENTITY SUBSCALE SCORES

| Variables | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EPSI Identity Subscale Score†** | *r* | .13** | .14** | .01 | -.06 | -.02 | -.05 | -.01 | -.02 | -.03 | -.06 | .05 | -.08 | -.08* | -.05 | -.13** | -.07 | -.13** | -.13** |
| | *n* | 601 | 601 | 601 | 601 | 601 | 599 | 600 | 598 | 599 | 598 | 598 | 600 | 599 | 601 | 600 | 601 | 601 | 601 |
| **23.Face-to-Face** | *r* | — | .27** | .02 | -.10* | -.08 | -.11* | -.14** | -.08* | -.12** | -.18** | .03 | -.14** | -.12** | -.16** | -.14** | -.07 | -.08* | -.09* |
| | *n* | | 603 | 603 | 603 | 603 | 601 | 602 | 600 | 601 | 600 | 600 | 602 | 601 | 603 | 602 | 603 | 603 | 603 |
| **24.Phone** | *r* | | — | .35** | .15** | .17** | .17** | .18** | .15** | .17** | .07 | .24** | .11** | .07 | .08* | .03 | .02 | .04 | .00 |
| | *n* | | | 603 | 603 | 603 | 601 | 602 | 600 | 601 | 600 | 600 | 602 | 601 | 603 | 602 | 603 | 603 | 603 |
| **25.TextMsg** | *r* | | | — | .21** | .35** | .40** | .37** | .36** | .38** | .20** | .17** | .06 | .06 | .05 | .02 | .03 | .04 | .02 |
| | *n* | | | | 603 | 603 | 601 | 602 | 600 | 601 | 600 | 600 | 602 | 601 | 603 | 602 | 603 | 603 | 603 |
| **26.InstantMsg** | *r* | | | | — | .39** | .31** | .34** | .27** | .33** | .35** | .30** | .46** | .41** | .39** | .37** | .26** | .41** | .34** |
| | *n* | | | | | 603 | 601 | 602 | 600 | 601 | 600 | 600 | 602 | 601 | 603 | 602 | 603 | 603 | 603 |
| **27.SocNetChat** | *r* | | | | | — | .55** | .52** | .45** | .54** | .45** | .34** | .25** | .22** | .25** | .20** | .13** | .20** | .19** |
| | *n* | | | | | | 601 | 602 | 600 | 601 | 600 | 600 | 602 | 601 | 603 | 602 | 603 | 603 | 603 |
| **28.PersonUpdates** | *r* | | | | | | — | .80** | .65** | .73** | .55** | .21** | .32** | .29** | .30** | .24** | .17** | .22** | .16** |
| | *n* | | | | | | | 601 | 599 | 601 | 599 | 600 | 601 | 599 | 601 | 600 | 601 | 601 | 601 |
| **29.UpdateProfile** | *r* | | | | | | | — | .71** | .75** | .53** | .27** | .36** | .34** | .34** | .28** | .18** | .25** | .18** |
| | *n* | | | | | | | | 600 | 601 | 600 | 600 | 602 | 600 | 602 | 601 | 602 | 602 | 602 |
| **30.UpdateProfile** | *r* | | | | | | | | — | .78** | .50** | .25** | .35** | .33** | .33** | .26** | .18** | .26** | .19** |
| | *n* | | | | | | | | | 599 | 598 | 598 | 600 | 598 | 600 | 599 | 600 | 600 | 600 |
| **31.ViewProfiles** | *r* | | | | | | | | | — | .53** | .30** | .33** | .29** | .31** | .27** | .17** | .24** | .16** |
| | *n* | | | | | | | | | | 599 | 600 | 601 | 599 | 601 | 600 | 601 | 601 | 601 |
| **32.SocNetApps** | *r* | | | | | | | | | | — | .27** | .45** | .44** | .44** | .43** | .29** | .36** | .30** |
| | *n* | | | | | | | | | | | 598 | 600 | 598 | 600 | 599 | 600 | 600 | 600 |
| **33.E-mail** | *r* | | | | | | | | | | | — | .30** | .26** | .28** | .21** | .11** | .22** | .18** |
| | *n* | | | | | | | | | | | | 600 | 598 | 600 | 599 | 600 | 600 | 600 |
| **34.DiscBoards** | *r* | | | | | | | | | | | | — | .78** | .72** | .66** | .47** | .62** | .59** |
| | *n* | | | | | | | | | | | | | 602 | 602 | 601 | 602 | 602 | 602 |
| **35.BlogWriting** | *r* | | | | | | | | | | | | | — | .87** | .68** | .51** | .61** | .57** |
| | *n* | | | | | | | | | | | | | | 601 | 600 | 601 | 601 | 601 |
| **36.BlogRespond** | *r* | | | | | | | | | | | | | | — | .71** | .48** | .58** | .58** |
| | *n* | | | | | | | | | | | | | | | 602 | 603 | 603 | 603 |
| **37.2ndLife** | *r* | | | | | | | | | | | | | | | — | .59** | .66** | .63** |
| | *n* | | | | | | | | | | | | | | | | 602 | 602 | 602 |
| **38.OnlineGames** | *r* | | | | | | | | | | | | | | | | — | .64** | .57** |
| | *n* | | | | | | | | | | | | | | | | | 603 | 603 |
| **39.StrangerChat** | *r* | | | | | | | | | | | | | | | | | — | .82** |
| | *n* | | | | | | | | | | | | | | | | | | 603 |

†EPSI Identity Subscale uses only four items identified as valid. ††40.GroupChat. *Correlation significant at the .05 level. **Correlation significant at the .01 level.