3-25-2018

Development of the Routines and Time Management Inventory for Young Adults

Morgan Ashwill Grinnell
Louisiana State University and Agricultural and Mechanical College, grinnell.morgan@gmail.com

DEVELOPMENT OF THE ROUTINES AND TIME MANAGEMENT INVENTORY FOR YOUNG ADULTS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by
Morgan Ashwill Grinnell
M.A., Louisiana State University and Agricultural and Mechanical College, 2014
B.A., University of North Carolina at Chapel Hill, 2011
May 2018

Acknowledgements

This undertaking would not have been possible without the help of many people. I would like to recognize my adviser Dr. Mary Lou Kelley and my committee members, especially Dr. Matt Calamia, and Dr. Thompson Davis III, for their advice with this research. I would also like to thank my fellow lab members, Jennifer Piscitello for her support during this project. A special thank you to Blair Kreger, for ensuring that I maintained a healthy balance and experienced lots of laughter throughout graduate school.

Secondly, I am grateful to my parents Darlene and David Ashwill, and my family for their unwavering support and encouragement throughout graduate school. You never doubted that I would complete this journey, and for that I cannot express enough gratitude. Thank you for valuing my education and pushing me to achieve my goals.

Finally, I would like to thank my husband, Chris Grinnell. Without you none of this would have been possible, and it definitely would not have been as much fun. Thank you for always encouraging me and supporting me despite not fully understanding what we had gotten ourselves into when I started all of this (including two cross country moves). I am so grateful to have you by my side as my partner throughout life and look forward to our next chapter.

Table of Contents

Abstract

Routines are observable and repetitive behavior patterns that are context specific and help to automate aspects of daily life (Sytsma, Kelley, & Wymer, 2001; Zisberg, Young, Schepp, & Zysberg, 2007). The presence of routines in an individual's life promotes overall functioning, and irregular routines have been associated with poorer physical and psychological health (Margraf, Lavallee, Zhang, & Schneider, 2016). Time management skills, such as those required to plan, prioritize, and execute tasks are crucial to cultivating stable routines. Although measures of routines exist for children, adolescents, families, and older adults, the routines of younger adults have been neglected.

The purpose of this study was to develop a psychometrically sound measure to quantify typical routines and time management practices in a young adult population. The resulting measure assessed four aspects of routines and time management: daily routines, social routines, time management, and procrastination routines. The item pool was generated using developmentally appropriate items from related measures, themes present in recently published literature, and theorized factors of routines. The items developed for the Routines and Time Management Inventory for Young Adults (RTMI), were administered to adults aged 18 to 35, along with established measures predicted to correlate with the RTMI. Exploratory factor analysis was used to determine item retention and factor structure of the measure. Also presented are reliability coefficients for the factors, and correlational analyses provide initial construct validity.

Chapter 1. Introduction

Establishing and adhering to consistent routines requires goal setting, prioritizing, and self-regulation. The development and maintenance of routines is not possible without these skills, which intersect with the concept of time management. Definitions and attributes of routines across different fields of study have considerable commonalities, such that routines are behavior patterns which are generally observable; organize the timing, duration, and order of events; are repetitive by nature within a given period; occur in specific contexts; and serve to automate activities thus conserving mental and physical resources (Zisberg et al., 2007). Time management is defined as "behaviors that aim at achieving an effective use of time while performing certain goal-directed activities" (Claessens, Van Erde, Rutte, & Roe, 2007). The effective use of time and other resources are characteristic of routines, but routines are also necessary for effective time management. As such, the two concepts of routine and time management are indissolubly linked.

Routines provide structure and stability to daily life, and without regular routines (e.g., personal hygiene or housekeeping tasks) daily life can become chaotic. Weisner (2010) transposed this notion and suggested that chaos prevents individuals and families from sustaining routines and concluded that well-being and chaos are inverse states. Routines are thought to strengthen family bonds; promote self-esteem, emotional stability, and well-being; serve as a protective factor against mental illness; and act as an indicator of overall functioning throughout the lifespan (Koome, Hocking, & Sutton, 2012; Zisberg, Young, & Schepp, 2009). Increased frequency and consistency of routines are often recommended as an intervention for parents seeking to mitigate their child's psychological or behavioral concerns and may even account for differences in symptom severity (Kiser, Bennett, Heston, & Paavola, 2005; Lanza & Drabick,

2011). This is especially true regarding children and adolescents with Attention-Deficit/ Hyperactivity Disorder (ADHD; Harris et al., 2013). Several measures of routines exist for children and adolescents in the context of family routines and daily functioning. However, research is relatively scarce regarding the routines of young adults.

Although routines appear important to daily functioning, they can prove difficult to develop and maintain in the absence of external structure provided by authority figures (e.g., parents, teachers, and coaches). As adolescents leave high school they are faced with momentous choices, such as whether to enter the workforce or attend college. New responsibilities accompany newfound autonomy. Young adults are expected to care for themselves, to prioritize their commitments, and to manage their time effectively. Utilization of time management skills demonstrated a greater buffering effect on anxiety and academic stress in college students than did increased leisure activities (Misra & McKean, 2000). The use of time management strategies has been shown to positively influence academic achievement and personal success (Britton & Tesser, 1991; George, Dixon, Stansal, Gelb & Pheri, 2008), rendering the skill set valuable for the well-being of young adults. Moreover, as young adults progress through their 20s and 30s, they may continue to encounter life-changing events such as marriage, relocation, and child rearing that can disrupt rhythms of daily living.

The dearth of empirical research related to quotidian routines and time management is salient because of implications on functioning, and the underlying value of understanding individuals' routines for the purposes of intervention. Knowledge related to routines and time management during this substantial life stage may be impeded by a lack of pertinent measures.

1.1 Purpose and Overview of Study

As mentioned above, routines have been suggested to have a positive and protective influence on overall functioning (Koome et al., 2012; Zisberg et al., 2009); while chaos can impede an individual's ability to follow typical routines, and directly opposes well-being (Wiesner, 2010). It follows that understanding routines throughout the lifespan is important, as they may differentiate between normal and disrupted functioning. The purpose of this study is to develop a measure which addresses the gap in assessment tools between adolescence and old age, specifically by building on the measures of routines in adolescents and families. Adults differ from adolescents not only in age, but also in increased freedom and responsibilities. A measure of routines in adults should not only measure behavioral patterns, but also assess inherently related concepts which contribute to establishing and sustaining stable routines, namely time management skills.

In the following sections, the role of routines, time management, and closely related concepts are elucidated. It should be noted that this literature review prioritizes research related to routines, as the development and adherence to routines in adulthood is believed to subsume time management skills (which are also a component of executive functioning). First, we define routines, time management, and survey the enmeshed relationship between routines and executive functioning. The complex and encompassing nature of executive functions are further discussed through an overview of theoretical models, one of which was based on executive dysfunction seen in ADHD. Accordingly, the status of research on ADHD is briefly reviewed with a developmental perspective and a focus on adults. The entwined relationship between ADHD and executive functioning has resulted in ADHD becoming a commonly researched disorder with respect to routines. Thus, research on routines in an ADHD population, as well as

comparatively limited research on routines in typically functioning adults are outlined. Finally, existing measures of routines and time use related to the development of the current measure are explored.

1.2 Conceptual Definitions

1.2.1 Routines. Routines are defined as observable behavior patterns that occur in the same order, at the same place and around the same time, on a consistent (e.g., daily or weekly) basis (Sytsma et al., 2001). Routines are context specific, repetitive, and automate aspects of daily life thus serving to conserve cognitive and physical resources (e.g., the assessment of needs and sequencing of activities; Zisberg et al., 2007). Typical routines for adults include those surrounding sleep, occupational and/or academic demands, mealtimes, social relationships, personal hygiene, and health related activities. Routines can provide a sense of stability and predictability in life for adults, as well as for children and adolescents (Kiser et al., 2005; Lindstedt & Umb-Carlsson, 2013).

1.2.2 Time management. Time management is a term used to describe methods of monitoring and controlling time expenditure with the goal of increasing task efficiency. The phrase is used interchangeably with other terms, such as time structure and time allocation, and is closely related to the concept of self-management (Claessens et al., 2007). According to Claessens and colleagues' (2007) review of the time management literature, the behaviors which comprise time management are time assessment behaviors (i.e., awareness of a specific time-point, and of one's use of time), planning behaviors (e.g., goal setting, planning tasks and priorities, making to-do lists), and monitoring behaviors (i.e., performing tasks/activities while observing time use).

1.2.3 Executive functioning. The development and adherence to daily routines requires planning, time management, initiation, and other skills which fall within the broader concept of executive functioning (EF). EF is an umbrella term that refers to the management of other cognitive processes. While research has generally shown that the prefrontal cortex mediates EF processes, there is less consensus regarding the taxonomy of these processes. Smith and Jonides (1999) endorsed the inclusion of (a) attention and inhibition, which is the process of attending to relevant information while ignoring irrelevant information; (b) task management, or the scheduling processes and switching involved in complex tasks; (c) planning, or designing a series of subtasks to accomplish a goal; (d) monitoring, which involves updating and checking to determine the next step in a sequence; and (e) coding, which refers to the encryption of representations in working memory. The processes comprised in EF render individuals able to adapt to novel situations, and are the foundation of many cognitive, emotional, and social skills (Lezak, Howieson, Loring, Hannay, & Fischer, 2004). Moreover, EF processes enable an individual to successfully engage in independent and goal-directed behavior.

Executive functions effect daily functioning in myriad ways. For example, a review of multiple studies of medical patients identified deficits in working memory, mental flexibility, and attention as contributing factors to medication nonadherence over time, despite the potential life-sustaining attributes of the medication regimens (Stilley, Bender, Dunbar-Jacob, Sereika, & Ryan, 2010). As such, it is important to understand EF as well as the relationship between EF and routines.

Models of executive functioning. Lezak identified four components of EF in her widespread theoretical model: volition, planning, purposive action, and effective performance (Lezak et al., 2004) Volition is the capacity for intentional behavior which requires both

motivation and self-awareness. Planning requires good impulse control, memory, and decision-making skills as well as the ability to imagine alternatives to current circumstances. Lezak defines planning as the recognition and organization of steps necessary to execute an intention or achieve a goal. Purposive action is the translation of the intention or plan into action through self-regulation. Finally, effective performance is a person's ability to monitor, self-correct, and regulate aspects of behavior (Lezak et al., 2004).

Alternatively, Miyake et al. (2000) argued that there are three main components in EF processes: inhibitory control, updating (i.e., working memory), and switching (i.e., cognitive flexibility). Inhibitory control is crucial for resisting temptations and impulses, ignoring intrusions, and regulating one's emotions. Updating is a process which refers to the ability to hold information in one's mind while manipulating it to solve a problem, thus updating and monitoring the information. Miyake et al. (2000) defined the process of shifting as switching between multiple tasks, operations, or mental sets, whereas Diamond's (2013) definition of cognitive flexibility expanded on the concept of shifting to include creative thinking, viewing situations from different perspectives, and quickly adapting to changed circumstances.

Although there are divergent theoretical models of EF, researchers generally agree that EF processes are necessary to plan and execute goal-directed behavior, to adapt to novel situations, and to self-regulate. As such, EF processes boast expansive influence over the daily lives of individuals. Poorer EF has been related to health difficulties such as obesity, poor treatment adherence, and substance abuse (Diamond, 2013; Stilley et al., 2010); whereas better EF is associated with improved quality of life and success in school and work (Diamond 2013; Dvorsky, & Langberg, 2014). In relationships, people with lower EF may be viewed by their

partner as less dependable, less supportive, and more difficult interpersonally; thus, marriages with a lower EF partner are more likely to be maladjusted (Diamond, 2013; Eakin et al., 2004).

EF deficits can be caused by traumatic brain injury, anoxia, alcohol abuse, and neurodegenerative diseases, but are also implicated without evident origin in many other psychological disorders including ADHD, Major Depressive Disorder and other mood disorders, addictive disorders (e.g., Substance Abuse Disorder), Obsessive Compulsive Disorder, Autism Spectrum Disorder, Schizophrenia, and debatably in Conduct Disorder (Craig et al., 2016; American Psychiatric Association, 2013; Diamond, 2013; Fairchild et al., 2009; Kenworthy, Yerys, Anthony, & Wallace, 2008; Lezak et al., 2004). Of these, ADHD has been one of the most studied relative to EF and is sometimes conceptualized as a disorder of EF, despite EF deficits being neither necessary nor sufficient for diagnosis (Solanto, 2015; Weyandt & Gudmundsdottir, 2015).

1.3 Overview of ADHD

Research has suggested that while ADHD symptoms may decrease with age, the disorder often persists into adulthood resulting in a prevalence rate of 2.5% for adults worldwide (Simon, Czobor, Balint, Meszaros, & Bitter, 2009). Although rates differ by geographic location, the prevalence rate is estimated to be 8.5% in US children and adolescents, and 4.4% to 5% in US adults (Kessler et al., 2006; Merikangas et al., 2010; Roberts, Milich, & Barkley, 2015). Biederman, Petty, Evans, Small and Faraone (2010) suggested that persistence of the disorder into adulthood is associated with greater psychiatric comorbidity, positive family history of mood disorders, and higher levels of educational and interpersonal impairment.

Diagnostic criteria for ADHD dictates that symptoms must be present prior to the age of twelve; occur in multiple settings; cause occupational, social, or academic impairment; not be

better accounted for by another psychiatric condition; and persist for at least six months (APA, 2013). ADHD diagnoses are categorized into one of three subtypes based on the primary presentation of symptoms. At least six of nine symptoms must be met in a category to qualify for diagnosis, although five symptoms may be acceptable for adults. Predominately Inattentive Presentation is diagnosed when the person's symptoms are typified by disorganization, lack of concentration, daydreaming, difficulty completing tasks, and other similar symptoms (APA, 2013). Predominately Hyperactive/Impulsive Presentation is diagnosed when the patient presents with symptoms such as problems remaining seated, difficulty awaiting turn, fidgetiness, and frequently interrupting others (APA, 2013). Combined Presentation is assigned when a person has many the outlined symptoms in both categories (APA, 2013). Disinhibition symptoms (i.e., hyperactivity and impulsivity) are generally noted earlier; however, symptom presentation can be unstable such that disinhibition may improve with age while inattentive symptoms often persist into adolescence and adulthood (Martel, von Eye, & Nigg, 2012; Willcutt et al., 2012).

ADHD is linked to numerous areas of difficulty which impact functioning across settings. The functional deficits most often associated with ADHD include nonexecutive attention and arousal, cognitive control and executive functioning, motivation and reinforcement, and temporal information processing (Nigg, 2013a). ADHD has been linked to difficulties with focus and filtering information, vigilance, alertness, working memory, response suppression, set shifting, planning, and time perception (Barkley, 1997; Barkley, Koplowitz, Anderson, & McMurray, 1997; Barkley, Murphy, & Bush, 2001; Nigg, 2013a; Nigg, 2013b; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). Solanto (2015) noted persistent impairments in response inhibition, working memory, and set shifting in adults with ADHD. Impairments in the noted

areas also lead to deficits in emotional self-regulation, frustration tolerance, arousal system reactivity, persistence in effort, response consistency, and productivity under delayed rewards (Solanto, 2015). These impairments are particularly noteworthy given the shared characteristics with EF deficits, and are expounded in the following section.

1.3.1 Executive functioning in ADHD. Adults with ADHD often struggle to self-regulate which includes the planning, organization, initiation, and completion of tasks on a timely basis, as well as tracking and shifting tasks, self-monitoring, and inhibiting other actions (Solanto, 2015). These skill deficits have significant overlap with areas of executive functioning (i.e., self-directed actions are needed to choose goals, as well as plan and engage in actions to attain those goals), and by extension with routines and time management. One of the most comprehensive theories of ADHD is Barkley's (1997) which links a primary deficit in behavioral inhibition to neuropsychological functions which depend on it: working memory, self-regulation of affect-motivation-arousal, internalization of speech, and reconstitution. In this model, executive functions directly affect motor control/fluency/syntax, and in turn influence behaviors such as ignoring task-irrelevant responses, re-engaging in tasks after disruption, persisting in and executing goal directed activities, and controlling novel or complex behaviors using internally represented information (Barkley, 1997). Thus, the behavior of individuals without EF deficits is governed more by internal representations such as plans, rules, hindsight, and forethought, while the behavior of individuals with ADHD is more heavily influenced by the immediate context and consequences.

Although EF weaknesses are undoubtedly associated with ADHD, some experts have cautioned against the conceptualization of ADHD as an EF disorder due to relatively small effect sizes and inconsistent impairments on traditional neuropsychological tests (Marchetta, Hurks,

Krabbendam, & Jolles, 2008; Wilcutt et al., 2005). In contrast, other researchers have suggested that variability of effect sizes, particularly those related to working memory, may be inflated by methodological differences in studies (Alderson, Kasper, Hudec, & Patros, 2013). Barkley and Murphy (2011) argued that ADHD adults were often clinically impaired on EF rating scales and less impaired on EF tests because of the low ecological validity of the laboratory tests. Clinicians and researchers have developed several EF rating scales for adults (e.g., Barkley Deficits in Executive Functioning Scale, and Behavior Rating Inventory of Executive Function) which measure EF impairments in the context of daily functioning and can help identify attention deficits. However, these do not provide a picture of daily functioning through the quantification of typical routines.

1.4 Routines and Time Management

1.4.1 ADHD population. Living with impairments in the areas of motivation, organization, planning, and persistence can lead adults to feeling as though they live in a state of chaos which they are only able to manage transiently, despite constantly striving to achieve control (Toner, O'Donoghue, & Houghton, 2006). There is evidence to suggest that engaging in simple daily activities requires inspiration, facilitation from others, and social connections for adults with ADHD (Ek & Isaksson, 2013). Yet, securing these supports may be more challenging given what is known about social, educational, occupational, and financial outcomes for adults with ADHD.

In families with ADHD children, increasing structure and routines is often prescribed as an effective non-pharmacological treatment component to reduce behavioral problems. There is a plethora of evidence which supports this as a component for effective intervention in children and adolescents (Chacko et al., 2015; Robin, 2015; Meyer & Kelley, 2007). Kiser et al. (2005)

found that nonclinical families were more likely to have family rituals or routines than clinical families, while Harris et al. (2013) found that routines could predict both internalizing symptoms (e.g., depression or anxiety) and externalizing symptoms (e.g., aggression or conduct problems) in children diagnosed with ADHD. Koome and colleagues (2012) detailed the functions of routines in families as strengthening family bonds, increasing social competence, serving as a protective factor against mental illness, indicating decomposition when disrupted, and improving educational outcomes and self-esteem. Parents of children with ADHD have emphasized the significance of routines and structure to daily functioning, and echo to researchers the vulnerabilities faced during morning and afternoon routines (Firmin & Phillips, 2009).

Evidence suggests that family rituals or daily routines during childhood and adolescence can have a lasting impact on adult functioning. In college students, Malatras and Israel (2013) found that self-control mediated the relationship between family stability, defined as daily rituals and routines within the family-of-origin (e.g., parents and siblings), and internalizing/externalizing problems. The authors concluded that family stability may promote the development of self-control, leading to positive adjustment. In a recent study, Malatras and colleagues (2016) explored young adults' perceived stability of routines in their families as related to self-regulation (i.e., time management) and attention problems. Their results indicated that time management mediated the relationship between perceived stability of routines in the family-of-origin and attention problems (Malatras, Israel, Sokolowski, & Ryan, 2016). The researchers' findings suggest that parents who schedule regular family activities may have better time management skills, which they directly or indirectly teach to their children (Malatras et al., 2016).

Multiple studies demonstrate that programs which teach organizational skills, time management, and planning to individuals with ADHD (i.e., children and adults) show significant promise for decreasing symptoms of ADHD and improving functioning (Abikoff et al., 2013; Bikic, Reichow, McCauley, Ibrahim, & Sukhodolsky, 2017; LaCount, Hartung, Shelton, & Stevens, 2015). Furthermore, this research suggests interventions which teach routines and time management to youth may have lasting implications for attention problems in adults. Advokat, Lane, and Luo (2011) found that although medication improved academic performance in college students with ADHD, it was not sufficient to overcome the academic disparity. Rather, their data suggested that good study habits appeared to alleviate the discrepancy, irrespective of medication status. Accordingly, Lindstedt and Umb-Carlsson (2013) evaluated the benefits of cognitive assistive technology products (e.g., key or object finders, pill dispensers, weekly schedules, electronic planning devices, and watches or alarm clocks) for adults with ADHD across daily environments. Of the products tested, two of the most highly valued products by the participants in the study were weekly schedules and watches, which are items frequently employed in time management and adherence to routines (Lindstedt & Umb-Carlsson, 2013).

1.4.2 Community population. Research related to adult self-regulatory activities (i.e., daily routines) is limited, particularly for nonclinical samples and younger adults. Sleep research is a significant exception to this assertion. Sleep is one of humans' most basic and impactful daily routines, and most adults are familiar with the recommendation to obtain approximately eight hours of sleep each night for optimal functioning. Kohyama (2016) suggested that daily sleep habits (e.g., sufficient sleep duration, and circadian rhythms) during early life are vital to success and to the development of self-control. Although some may assume that sleep duration is the most influential aspect of sleep, Lemola, Ledermann, and Friedman (2013) found that across

a diverse sample of adults, high day-to-day variability in sleep duration had a more deleterious effect on subjective well-being, even after controlling for a host of other factors (e.g., age, gender, marital status, BMI, education). Moreover, adults with consistent but low sleep duration had more difficulty ignoring irrelevant stimuli and redirecting attention than other adults, which suggested that both duration and consistency/variability were important factors (Whiting & Murdock, 2016). Trockel, Barnes, and Egget (2000) found that sleep habits, especially wake-up time, accounted for the largest amount of variance in academic performance for college students when compared to other health-related variables including exercise, eating, sleep habits, time management, and social support. Consequently, consistent sleeping and waking routines appear important to optimizing subjective well-being, cognitive functioning, and achievement or objective functioning.

Young adults have also been the subject of several studies broadly related to time management and general functioning. Achievement in college (i.e., grade point average [GPA]) appears to be influenced by organization, motivation for achievement, and academic self-efficacy (Dvorsky & Langberg, 2014; Robbins et al., 2004). Yet, both organization and continued motivation/persistence towards goals require time management skills. Seminal work by Britton and Tesser (1991) looked at the effect time management practices had on college achievement. Specifically, they developed a measure which assessed attitudes towards time, as well as short-range and long-range planning, and found that time attitudes and short-range planning both had significant impact on grades and were better predictors of college achievement than standardized testing scores (Britton & Tesser, 1991). Of note, the items that contributed to the more influential scales included questions about planning behaviors, daily schedules, and daily goals, all of which are reflected in daily routines. Relatedly, George et al. (2008) measured

contributing factors to both personal and academic success and discovered that time-management skills were integral to both types of success. The researchers' "Total Success" composite was best predicted by clearly defined goals, time-management skills, healthy eating, waking up early, less time spent sleeping, computer ownership, and less passive leisure time (George et al., 2008). Their findings highlight the importance of routines and planning in time management and correspond with other findings related to sleep.

There is mounting evidence that consistent routines are associated with healthier lifestyles. One study looking at consistency in adults' bedtimes found that greater bedtime variability was associated with poorer lifestyle behaviors including lower dietary quality, more sedentary behaviors, insufficient sleep, and higher alcohol consumption (Duncan, Kline, Rebar, Vandelanotte & Short, 2016). Researchers look to regular social rhythms or routines such as mealtimes, hygiene practices, bedtimes, social interactions, and physical activity as indicators of overall health and stability. Across cultures, irregular social routines have been linked to more health problems, anxiety, stress, and depression, while greater routine regularity is associated with better overall health, life satisfaction, and positive mental health (Margraf, Lavallee, Zhang & Schneider, 2016).

1.5 Existing Measures

1.5.1 Measures of routines. The impact of overall daily routines on psychological and physical health in adults has been recognized by the field of psychology for some time (Margraf et al., 2016). Yet, more psychometrically sound measures of daily routines are available for children, adolescents, and families than for adults, especially young adults. Relevant existing measures are reviewed below.

Measures of routines in children, adolescents, and families. There are several useful measures of routines in children/adolescents and families which possess good reliability and validity, most notably the Child Routines Questionnaire (CRQ; Sytsma et al., 2001), Family Routines Inventory (FRI; Jensen, James, Boyce, & Hartnett, 1983), and Stability of Activities in the Family Environment (SAFE; Israel, Roderick & Ivanova, 2002).

The CRQ (Sytsma et al., 2001) measures daily living routines, household responsibilities, discipline routines, and homework routines as rated by parents on a five-point Likert scale. The measure has shown excellent internal consistency (α=.90) and test-retest reliability (r=.86). Additional studies using the CRQ have demonstrated its adequate convergent validity and construct validity. For example, Harris et al., (2013) found that CRQ scores were inversely related to both internalizing and externalizing symptoms in children previously diagnosed with ADHD for all scales except the discipline routines scale. Scores on the CRQ have also been related to children's psychological adjustment (Bridley & Sytsma-Jordan, 2012), and management of chronic conditions (Crespo, Santos, Canavarro, Kielpikowski, Pryor, & Féres-Carneiro, 2013).

The FRI (Jensen et al., 1983) is a parent-report questionnaire consisting of 28-items assessing routines within families on a four-point Likert scale ranging from *Almost never* to *Always*. The items which comprise the FRI assess the frequency and importance of family organization, predictability, and coherence. The items measure routines such as special time with parents or as a family, bedtime, family meals, play time, leaving/returning home, and "quiet time" with the family. The measure demonstrates good internal consistency, test-retest reliability, and construct validity (Manczak, Williams, & Chen, 2017, Sytsma et al., 2001; Jensen et al., 1983). Studies have used the FRI to examine psychological well-being, transmission of

depression within families (Manczak et al., 2017), literacy outcomes for economically disadvantaged youth (Dove, Neuharth-Prichett, Wright, & Wallinga, 2015), and numerous other topics.

An unpublished measure, the Adolescent Routines Questionnaire (ARQ; Meyer, 2008) was created to measure broad daily routines for adolescents and their families, since many of the existing measures were limited by their lack of ability to assess routines for adolescents, especially because adolescents typically spend more of their time independent from the family than children. Initial results for the measure found a five-factor structure accounted for the most variance at 42.10% for the parent report and 35.32% of the adolescent report, and included daily living routines (e.g., consistent wake-up time), School & Discipline Routines (e.g., homework routines, consequences for misbehavior), Extracurricular Activities (e.g., attendance at after school activities), Household Activities (e.g., eating dinner with the family), and Social Routines (e.g., talking to or spending time with friends). Results from the initial study indicated that the 33-item parent and adolescent report ARQ measures had good internal consistency, test-retest reliability, inter-rater reliability, and moderate evidence of validity (Meyer, 2008). Further results demonstrated a negative correlation between externalizing problems and routines, as well as positive correlations between daily routines and adolescent adaptive skills/personal adjustment (Meyer, 2008).

Each of these measures is a commendable tool for the assessment of routines. However, all of them are inappropriate for utilization with adults, as they focus on routines of intact families or routines facilitated by adults, and often rely on the parent's perspective. Although they provide valuable information about important areas of functioning which should be included in measures of routines (e.g., bedtime, mealtimes, social activities), they are inadequate for

measuring daily routines of adults, especially younger adults who have moved away from home and may not yet have children of their own.

The SAFE (Israel et al., 2002) is a 23-item self-report measure of the regularity of daily events and family activities (i.e., family stability). The measure differs from the ones reviewed above as it was created to gather college students' retrospective ratings of routines in their family-of-origin (i.e., their families' household activities when they were children). The SAFE has been used to demonstrate that more regular and positive family interactions are predictably associated with lower levels of depression and higher self-esteem in young adults (Israel et al., 2002). One study employing the SAFE found that self-control mediated the relationship between childhood family stability and internalizing/externalizing problems as adults, which suggests that family stability may foster the development of self-control and lead to more positive adjustment in adulthood (Malatras & Israel, 2013). Further research associated increased attention problems with decreased family stability and poorer time-management skills, and the authors found that the relationship between perceived family stability and attention problems in young adults was mediated by time-management skills (Malatras et al., 2016). While the SAFE is a unique measure to assess effects of family stability during development, its retrospective nature renders it inadequate for measuring current routines away from the family home.

Social Rhythm Metric (SRM; Monk, Flaherty, Frank, Hoskinson, & Kupfer, 1990). One method used to assess adult routines is exemplified by the SRM. This measure was developed to assess regularity in an individual's life using social zeitgebers and was normed using healthy controls. The measure is a 17-item two-week diary consisting of categories of activities (e.g., mealtime, bedtime, physical exercise, leave house, take nap) for which start-times (and end-times if applicable) are recorded as accurately as possible (e.g., First social contact –

9:07 a.m.). The SRM demonstrates good test-retest reliability in healthy controls, and provides robust and valid data (Zisberg et al., 2009; Monk et al., 1990). The SRM has been used in clinical populations, such as people with depression who, compared to healthy controls, showed more intrasubject variability in routines and appeared to rely more on prompting from others (Monk, Kupfer, Frank, & Ritenour, 1991). Additional studies have used the SRM to examine sleep quality, social contact (Tighe, Dautovich, & McCrae, 2016), and daily activities in special populations such as college students (Carney, Edinger, Meyer, Lindman, & Istre, 2006), shift workers (De Almondes & Araujo, 2011), and those diagnosed with Parkinson's disease (Magalhães, Souza, Dias, de Bruin, & de Bruin, 2005).

Although the SRM provides robust information about daily patterns of behavior, a primary limitation is time and effort it takes to complete the measure. It requires daily recording over the course of two weeks, which is not always practical or necessary for assessment of routines. Further, because of the exactness and length of the assessment, the SRM does not allow for more detailed (e.g., leisurely social contact, or hygiene routines) or less regular routines (e.g., weekly or monthly activities like paying bills, attending meetings) to be adequately represented. Alternatives to the SRM such as completing a "Yesterday Interview," have similar limitations to the SRM, while other measures rely on qualitative data (Zisberg et al., 2009).

Scale of Older Adults' Routine (SOAR; Zisberg et al., 2009). Based on limitations of existing measures of adults' routines, Zisberg and colleagues created a measure which looked at typical daily routines for older adults. The SOAR is a 42-item scale which covered areas such as basic routine activities (e.g., hygiene routines, skin/hair care, eating, bowel movements), instrumental activities (e.g., making the bed, preparing meals, tidying up, shopping/errands, transportation activities), rest (e.g., sleep and naps), leisure activities (e.g., reading, watching TV,

praying, educational activities, sports, arts and crafts), and social participation (e.g., visiting with others, group activities, caring for pets, volunteering/paid work, playing games). In addition to identifying daily activities, participants recorded the time of the activities. Initial results indicated that the scale had good reliability on some scales such as the basic activities scale, but lower reliability on items that required external resources or assistance. The authors also hypothesized that some of the lower reliability across time points may be due to bi-weekly or monthly routines which the measure could not encompass well (Zisberg et al., 2009). Validity estimates for the SOAR measure showed moderate correlations.

While the SOAR includes many activities that would also be present in younger adults' lives, the sample consisted of adults over the age of 65 who were living in a retirement community, and most were not employed. Aside from possible generational gaps in interests (e.g., playing bingo and card games), the measure does not account for the time-consuming additional responsibilities of adults to attend school or work. These activities generally require planning around predetermined times, which may be unlike activities available to older adults. Finally, the measure's recording of times of activities relies on strict and repetitive day-to-day routines which may have contributed to complications seen when assessing reliability of routines.

1.5.2 Measures related to time management.

Barkley Deficits in Executive Functioning Scale (BDEFS; Barkley, 2011). The BDEFS is an 89-item questionnaire (long-form) used to assess dimensions of executive functioning of adults in daily life. The measure has both long and short forms for self- and informant-report, where behaviors over the past six months are rated on a four-point scale ranging from *Never or Rarely* to *Very Often* (Barkley, 2011). The BDEFS was developed to assess commonly cited

constructs of EF (i.e., inhibition, nonverbal working memory, verbal working memory, organization, problem solving, time management, self-motivation, and self-regulation of emotions; Barkley, 2011; Barkley, 2012). The five factors that resulted from Barkley's (2011) scale are self-management to time (e.g., have difficulty judging how much time it will take to do something or get somewhere), self-organization and problem-solving (e.g., unable to come up with or invent as many solutions to problems as others seem to do), self-restraint (e.g., make impulsive comments to others), self-motivation (e.g., inconsistent in the quality or quantity of individual work performance), and self-regulation of emotion (e.g., overreact emotionally; Barkley, 2011). Each of the factors have loadings of at least 0.40, and account for more than 2.5% of the variance (Allee-Smith, Winters, Drake, & Joslin, 2013; Barkley, 2011). Ratings from the measure yield a Total EF summary score, and an ADHD-EF Index consisting of 11 items which were found to have the greatest ability to discriminate adults with ADHD from those without ADHD in a clinical control sample and community control sample (Barkley, 2011). The BDEFS was normed using a 100-item version of the measure in a representative sample of the US population aged 18 to 96 (Allee-Smith et al., 2013; Barkley, 2011). On this prototype version, the self-organization and problem-solving factor accounted for 13.9% of the variance, and self-management to time accounted for 12.0% of the variance, whereas self-motivation accounted for the least amount of variance at 8.1% (Barkley, 2011; Coffman, 2014). Internal consistency was found to be high, ranging from α= .91 to .96 for each of the scales and test-retest reliability was also acceptable (r = .62 to .80, p < .001, across all indices; Barkley, 2011).

Since publication, researchers using the BDEFS found that college students with EF deficits (particularly those with low self-restraint) are more likely to use prescription stimulants

for non-medical purposes than other students, but non-medical prescription stimulant use does not help students with EF deficits perform better academically (Munro, Weyandt, Marraccini, & Oster, 2017). The BDEFS has also been used in studies measuring the emerging concept of Sluggish Cognitive Tempo (Barkley, 2012; Wood, Lewandowski, Lovett, & Antshel, 2017), and outcomes for adapted manualized cognitive-behavioral therapy treatment for ADHD (Puente & Mitchell, 2016). The scale has also been compared to EF tests (Dehili, Prevatt, & Coffman, 2017), translated to Spanish (Vélez-Pastrana et al., 2016), and examined in a college population (Coffman, 2014).

There are some limitations to the measure: As an example, the BDEFS was curated over time which lends well to its utility, but also elicits concern because much of the research related to its development utilized a prototype version of the BDEFS (i.e., with different items and factors; Allee-Smith et al., 2013; Barkley, 2011; Coffman, 2014). The BDEFS is a unique measure of functional impairments caused by EF deficits in adults, and is a valuable model for the RTMI, especially the self-management to time and organization related factors, and because of its ability to screen for ADHD. Despite these merits, the BDEFS was created to measure constructs defined as part of EF, with a primary goal of identifying deficits. Although the time management facet is shared, the RTMI differs from the BDEFS because it specifically targets time management within the theorized construct of routines.

Specific measures of time management. There are a number of measures which specifically assess time management including the Time Management Questionnaire (TMQ; Britton & Tesser, 1991), the Time Management Behavior Scale (TMB; Macan, Shahani, Dipboye, & Phillips, 1990), and the Time Structure Questionnaire (TSQ; Bond & Feather, 1988).

The TMQ, as discussed in an earlier section, is a measure developed by Britton and Tesser (1991) during a four-year long study designed to evaluate the effects of time management practices on GPA. The authors aimed to measure goal setting, list making, and priority setting in their student participants. The TMQ consists of 35 items rated on a five-point scale from *Always* to *Never*. The resulting measure accounted for 36% of the variance and included three factors classified as short-range planning (e.g., Do you plan your day before you start it?), time attitudes (e.g., Do you often find yourself doing things which interfere with your school work simply because you hate to say "No" to people?), and long-range planning (e.g., Do you regularly review your class notes, even when a test is not imminent?). The short-range planning and time attitudes factor were better predictors of GPA, even above standardized test scores (Britton & Tesser, 1991). The TMQ is employed regularly in studies with students (e.g., Malatras et al., 2016) and has been adapted for use in other cultures. However, as evident from the exemplars above, the measure is less relevant to the current study because it focuses on students and student-related practices.

When first developed using a student sample, the TMB was a 46-item measure which used a five-point scale ranging from *Seldom True* to *Very True.* The initial version consisted of four factors which accounted for 72% of the common variance (Macan et al., 1990). These factors were setting goals and priorities, mechanics – planning and scheduling, perceived control of time, and (reverse-scored) preference for disorganization (Macan et al., 1990). The TMB was found to correlate significantly with important outcome variables such as stress and performance (Macan et al., 1990). Later, an updated 33-item TMB and five-item measure of perceived control of time was administered to employees during a study about the effectiveness of time management training (Macan, 1994). The resulting 29-item TMB yielded three factors that

accounted for 81% of the common variance and included goal setting/prioritizing (e.g., sets deadlines, breaks down tasks), mechanics of time management (e.g., practices record keeping, avoids interruptions), and preference for organization (e.g., forgets lists made, has messy work space; Macan, 1994). This measure has been used to evaluate time management training (Macan 1994), and compared with prospective memory (Macan, Gibson, & Cunningham, 2010). Although there have been some studies that confirm the factor structure of the TMB, there are other studies which yielded more factors (e.g., Mudrack, 1997). The TMB is considered a strong measure of time management behaviors, but the inconsistent factor structure and low subscale reliability estimates are cause for concern (Hellsten, 2012; Mudrack, 1997).

The TSQ was developed by Bond and Feather (1988) to measure the concept of time structure, defined as the degree to which an individual perceives their use of time as purposeful and structured, which has been used interchangeably with the construct of time management. It is a 26-item self-report measure where each item is rated on a seven-point scale (Appendix D), and consists of five factors (Bond & Feather, 1988). Within the three samples used during development, reliabilities were found to be high, and inter-item correlations were positive (Bond & Feather, 1988). A more detailed review with psychometric information is included in the methodology section below. The TSQ has been utilized in research measuring both well-being and depression in unemployed individuals (Goodman, Geiger, & Wolf, 2017; Van Hoye & Lootens, 2013), and the relationship between boredom and time structure (Vodanovich & Watt, 1999). The measure's items appear closely related to the concepts of routines and time-management, which largely contend with the structuring of time. Mudrack's (1997) comparison of the TMB and TSQ confirmed the factor structure of the TSQ, although he eliminated several items from the scale during his factor analysis. Overall, Mudrack's analyses suggested that the

TSQ could be used in its original format, but the author expressed concern over the "wildly" varied composition of the TMB subscales across studies (1997).

1.6. Rationale of Current Study.

The presence and regularity of routines have been measured most thoroughly in children, adolescents, and families, and although a minority of measures target the routines of adults (e.g., SRM and SOAR), they are limited in their population and scope. Research suggests that increasing organization, time-management, and routines for adults with ADHD can improve functioning in areas like academic achievement, and researchers have emphasized the importance of sleep and sleep-related habits in adults. Moreover, research in community populations has shown that greater routine regularity is associated with higher levels of life satisfaction, and overall well-being, while more irregular routines are correlated with a bevy of negative mental and physical health outcomes (Margraf et al., 2016). However, there remains a paucity of data as to what constitutes typical routines for young adults and the frequency with which these routines take place. Based on the literature reviewed, routines involving time management strategies are like other routines (e.g., hygiene tasks) because of their continuity through adulthood, and their impact on an individual's ability to thrive as an adult. The goal of the current study was to take steps to ameliorate this void by developing a measure to quantify typical routines in young adults. Like measures of routines in younger populations (e.g., Harris et al., 2013; Meyer, 2008), we hoped this measure would also have a secondary benefit in differentiating adults with ADHD from community samples, thus providing useful information for targeted interventions.

1.7 Hypotheses.

Due to a vacuum of measures related to routines in this population, the purpose of this study was to construct a developmentally-appropriate measure of typical routines in young adults. Thus, the following hypotheses were proposed:

1. Based on measures of routines in adolescents (i.e., ARQ) and older adults (i.e., SOAR) which both resulted in a five-factor structure, we predicted that the current measure would also consist of five factors. Using related measures as models, we predicted the factors would include: Daily Living Routines (e.g., sleep/wake schedule, meals, hygiene), Organizational/Instrumental Routines (e.g., chores, vehicle maintenance, managing money), Health Related Activities (e.g., exercise, medical appointments, substance use), Social/Leisure Routines (e.g., talking with family or friends, engaging in outside activities), and Time Management Routines (e.g., attending events on time, prioritizing important activities, scheduling).
2. We predicted that the frequency of routines endorsed by young adults would be positively correlated with time management as measured by the Time Structure Questionnaire (TSQ; Bond & Feather, 1988).
3. The frequency of routines was expected to be positively correlated with perceived life satisfaction, as endorsed on the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985).
4. Additionally, we proposed that the frequency of routines would be positively correlated with positive mental health, as measured by the RAND SF-36 *Emotional Well-being* scale (Hays, Sherbourne & Mazel, 1993).

5. Relatedly, the frequency of routines endorsed by young adults is expected to be negatively correlated with Inattentive and Hyperactive/Impulsive symptoms of ADHD as measured by the overall score of the Adult ADHD Self-Report Scale (ASRS; Kessler et al., 2005). As such, we predicted that adults with self-reported ADHD would endorse fewer routines and time management behaviors than those without ADHD. Relatedly, it was expected that the RTMI scores would distinguish those with self-reported ADHD from those without reported ADHD.

Chapter 2. Method

2.1 Phase I: Item Generation

2.1.1 Method.

Procedure. A pool of items was generated with the goal of capturing typical routines for young adults, including both students and working adults. The item pool was produced using several sources including descriptive reports from young adults, developmentally-appropriate items from previous scales measuring routines in other populations, and review of relevant literature. Item generation utilized theorized dimensions of routines along with time management-related routines and resulted in 80 items. After removing items which could only apply to students, 72 items remained.

Reviewers were recruited to judge content and face validity of the drafted pool of 72 items (Clark &Watson, 1995; Netemeyer, Bearden, & Sharma, 2003). Based on initial feedback from a professor and two graduate students in clinical psychology, similar items were combined and several irrelevant items were deleted, reducing the pool to 67 items. After being briefed on the rationale for the measure, seven current students or recent graduates from the clinical psychology doctoral program and a professor examined the item pool. This group suggested revisions, deleted redundancies, and recommended additional items. Most of the reviewers fell within the target population's age range. Reviewers rated items based on the extent to which they agreed the content was relevant and suitable to the construct, on a scale of 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Items with below average ratings (i.e., less than 3) were eliminated. This resulted in 54 items total, with between seven and sixteen items retained to account for each hypothesized factor.

2.2 Phase II: Item Selection/Reduction

2.2.1 Method. Determining an appropriate sample size for factor analysis during the development of a new scale requires several considerations including the number of factors and breadth of the measure (Clark & Watson, 1995). Because the current measure builds from the framework of previous measures, it is possible that a smaller sample would have been sufficient; yet, several experts in methodology recommend a sample size of approximately 300 participants, which was the recruitment goal for the current study (Clark & Watson, 1995; DeVellis, 2017).

Previous research has defined young adulthood in a variety of ways. Some researchers (e.g., Arnett, 2000) conceptualize young adults as those aged 18 to 25, while others (e.g., Erikson and Levinson, as discussed in Bentley, 2007; Atwood & Scholtz, 2008) have extended the range to capture individuals in their 30s and up to 40 years of age. Defining young adulthood as ages 18 to 35 allowed the current research to capture a wide range of nuanced stages of transition within the phase of adulthood (e.g., single/in a relationship/married, with/without children, college/career).

Participants. Participants included adults aged 18 to 35 recruited from two sources. A student sample was recruited through the psychology participant pool (n = 200), while other adults (n=292) were recruited through word-of-mouth, social media, and websites which advertise research opportunities. A total of 492 participants consented and began the online survey. Of those, 389 participants (79%) completed the questions included in the RTMI and passed the validity checks therein. Attrition and careless responding is a well-documented risk when using online surveys and may be attributable to fatigue from long survey instruments, or increased anonymity and distraction (Huang, Curran, Keeney, Poposki, & DeShon, 2012; Ward, Meade, Allred, Pappalardo, & Stoughton, 2017). Appendix H describes the demographic

information of the participants whose data was not able to be used in the following analyses due to attrition and careless responding. This demographic data was largely similar to the demographics of participants with viable data, with the exception of the quantity of missing data. Table 1 shows the demographic information for the 389 participants whose data was used in the exploratory factor analysis of the RTMI. The sample utilized for the EFA was predominately female (77.6%) and Caucasian (85.9%). The mean age for the sample was 24.17 (*SD*=5.43), and 59.4% were students. Most of the sample reported no previous psychological diagnoses (66.8%).

Table 1. Demographic Information for EFA of the RTMI

Demographic Variables	Frequency	Percentage
N	389	
Age	*M* = 24.17 (5.43)	
Gender		
Female	302	77.6
Male	87	22.4
Academic Status		
Student	231	59.4
Not Student	158	40.6
Hispanic/ Non-Hispanic		
Hispanic	24	6.2
Non-Hispanic	365	93.8
Race		
Caucasian	334	85.9
Black/Af. Amer.	23	5.9
Asian/Pac. Islander	17	4.4
Multiple Races	10	2.6
Amer. Indian/Alaskan Native	4	1.0
Other	1	0.3
Education Level		
Less than High School	2	0.5
High School Graduate	87	22.4
Some College, No Degree	117	30.1
Associate Degree	10	2.6
Bachelor's Degree	97	24.9
Master's Degree	53	13.6
Doctoral Degree	15	3.9
Professional Degree	8	2.1
Employment		
Unemployed	104	26.7
Work <20 hours/week	105	27.0

(table, cont'd.)

Demographic Variables	Frequency	Percentage
Work 20-39 hours/week	42	10.8
Work Full-Time (40+hours)	138	35.5
Income		
$0-$4,999	161	41.4
$5,000-$9,999	15	3.9
$10,000-$14,999	21	5.4
$15,000-$24,999	24	6.2
$25,000-$34,999	22	5.7
$35,000-$49,999	21	5.4
$50,000-$74,999	43	11.1
$75,000-$99,999	31	8.0
$100,000+	49	12.6
Missing	2	0.5
Relationship Status		
Single	150	38.6
In a relationship	106	27.2
Living with partner	28	7.2
Married	102	26.2
Separated	1	0.3
Divorced	1	0.3
Widowed	1	0.3
Psychological Diagnoses		
No reported diagnoses	260	66.8
ADHD	26	6.7
Adjustment Disorder	1	0.3
Anxiety Disorder	35	9.0
Autism Spectrum Disorder	1	0.3
Bipolar Disorder	2	0.5
Depressive Disorder	12	3.1
Learning Disorder	4	1.0
Schizophrenia	2	0.5
Multiple disorders	43	11.1
Other	3	0.8

Measures. Participants completed questionnaires related to demographics, time management and structure, general life satisfaction, psychological distress, and ADHD symptoms in addition to items generated for the Routines and Time Management Inventory for Young Adults (RTMI). (Appendix B). For this portion of the analyses, two of the measures included in the overall survey were relevant.

Demographic questionnaire. Participants completed a questionnaire which asked for basic information related to age, sex, marital/relationship status, education level, job/academic status, income, and mental health diagnoses. This questionnaire can be viewed in its entirety in Appendix C.

Routines and Time Management Inventory for Young Adults (RTMI). Participants were presented with items developed during Phase I (Appendix B) related to routines and time management and asked to rate how frequently they engaged in each behavior over the last month, on a scale of 0 (*Never*) to 4 (*Almost always*). For analyses, these values were transposed to range from 1 (*Never)* to 5 (*Almost always).*

Procedure. After receiving IRB approval, student participants at Louisiana State University (LSU) were recruited through undergraduate psychology classes and received course credit for participation. Non-student participants and students attending schools other than LSU were recruited through social media, word-of-mouth, and websites which allow advertisement of research studies (e.g., Craigslist). These participants were given the option of entering to be randomly awarded a gift card for their participation. Participants completed questionnaires using Qualtrics online survey software. Prior to beginning the questionnaires, participants were presented with information about the study and provided informed consent (Appendix A).

2.2.2 Results.

Data screening. All analyses were conducted in *R* (R Core Team, 2017) primarily using the *psych* package developed by Revelle (2017). Prior to conducting data analysis, items were screened for normality, skewness, and kurtosis. This examination showed that several items were skewed and kurtotic; however, these items were retained in analyses with no corrections, as some basic routines (e.g., hygiene routines, attending work) are not expected to be normally distributed

in a community (i.e., mostly non-clinical) sample. Of note, the skewed and kurtotic items were ultimately eliminated during the factor analysis procedure because they also failed to load significantly onto any factor. Further, several participants were indicated as multivariate outliers based on their significant Malhalanobis distance scores. However, these participants were retained for analyses as it is expected that some adults have far more or far fewer routines and time management skills than others. Further, based on these outlying participants' completion of the measures and passed attention checks, there was no reason to believe their responses were invalid.

Initial item selection. Initial item analyses included examination of item frequencies, item means, and inter-item correlations. Items that were endorsed infrequently (i.e. less than 15% of the time) or had item means which did not approach the median value for responses were considered for elimination (DeVellis, 2017). One item related to using tobacco was eliminated based on low frequency. Several items (e.g., I consistently attend work/work obligations) had high means but were retained for further analyses due to theoretical importance (Clark & Watson, 1995). Inter-item correlations were examined to determine if there were any additional items that could be eliminated based on similarity; however, the correlation coefficients for the item pairs were all less than .7, so no items were eliminated based on this criterion. Item-total correlations were screened for items which did not correlate strongly with the overall scale. It was suggested that several items be reverse scored. Reverse-scored items were negatively worded and expected to be reverse-scored, except one item (i.e., "I spend time daily browsing the internet or using social media"), which was ultimately reverse-scored because of cohesiveness with the overarching theoretical perspective. Item-total correlations were also reviewed for correlation coefficients of items with the remainder of the scale if the individual

item was dropped (DeVellis, 2017; Floyd & Widaman, 1995). This review highlighted several items that did not correlate highly with the overall scale (Appendix I); however, they were retained to investigate how they would behave during the exploratory factor analysis.

After initial examination of the data, a parallel analysis was conducted to determine the number factors which would be appropriate for the data (Floyd & Widaman, 1995). Most of the data fell within the assumption of the normal distribution, so the chosen factor extraction method for both the parallel analysis and subsequent factor analyses was maximum likelihood (ML), which is a robust model fitting procedure (Costello & Osborne, 2005; Fabrigar, Wegener, MacCallum, & Strahan, 1999). The results of the parallel analysis suggested the data could support up to twelve factors.

Using the results of the parallel analysis, the remaining 53 items were factor analyzed using a 12-factor solution with ML extraction method and an oblique promax rotation. Multiple criteria have been suggested for determining the optimal number of factors to retain in a solution, including factor loadings above .3 or .4, simple structure, and retaining factors with three or more items per factor (Fabrigar et al., 1999; Floyd & Widaman, 1995, Costello & Osborne, 2005). Floyd and Widaman (1995) additionally suggest the Tucker-Lewis Index score, a measure of factoring reliability which is not as sensitive to sample size as other indices, should be greater than or equal to .95. The resulting 12-factor solution had several factors with only two to three items loaded on them, several items which cross-loaded onto multiple factors, and was not interpretable. The Tucker-Lewis Index for the 12-factor solution was .911, and thus did not meet the .95 cutoff, nor did any other solution described below. As such, measures of internal consistency, variance, factor loadings, and interpretability were utilized heavily in choosing a preferred factor solution.

All possible factor solutions with fewer than twelve factors were run for comprehensiveness, and to determine which solution would produce the most theoretically and empirically sound structure. Each of these used ML extraction and promax rotation, a form of oblique rotation which allows factors to be correlated with one another. Factor solutions with more than seven factors were found to be uninterpretable and possessed factors with few items as well as cross-loading items. In the solutions with fewer factors, it was noted that two items related to alcohol consumption and partying consistently loaded onto their own factor with no other items. These items were not theoretically cohesive with the remainder of the items, (supported by the low correlations of each item with the whole scale against the scale without the item), and were problematic for factor structure, thus additional analyses were conducted after deleting these items. After examining the interpretability and item loadings of the remaining factor solutions the most promising factor solutions fell between three and six factors. The loadings were examined, including those for the hypothesized five factor solution. Based on this review, the most theoretically sound and interpretable solutions were the 3-factor and 4-factor solutions.

The items that failed to load or loaded onto multiple factors for each of the remaining factor solutions were removed and the analyses were re-run with the reduced number of items, between 22 and 27 items for each factor solution (i.e., 3-, 4-, 5-, and 6-factors). The 3-factor and 4-factor solutions produced the most stable loadings after item-reduction with the fewest cross-loadings. The internal consistency for each factor, overall alpha values, and variance accounted for were compared between the 3-factor and 4-factor solutions. While both solutions were statistically very similar, the 4-factor solution fit better with theoretical predictions, had a greater quantity of items loading onto each factor, and the relationship between factors was more cogent.

As a result, the 4-factor solution was chosen as the best factor structure for the data. Items removed from the final version of the RTMI can be viewed in Appendix I.

Using the remaining 25 items (see Table 2), a final factor analysis was conducted for the 4-factor solution. The 25-item version of the RTMI is presented in Appendix J. Factor 1, labeled *Daily Routines*, consists of seven items which represent routines that are daily regulatory activities, such as sleeping and eating (as seen in Table 2). The internal consistency for the *Daily Routines* factor was α= .79. Factor 2, labeled *Social Routines* consists of seven items measuring communication, responsiveness, and participation in social activities. The *Social Routines* factor demonstrated adequate internal consistency (α= .73). Factor 3 was labeled *Time Management* and consisted of five items related to timeliness and planning, which also had adequate internal consistency (α= .72). Of note this factor had one item that also loaded onto the *Daily Routines* factor, albeit more weakly. Finally, the Factor 4 was made up of six items related to productive activities and inversely scored items related to interference activities and was labeled *Procrastination Routines.* This factor demonstrated questionable internal consistency (α= .64); however, based on the developmental stage of the RTMI no further items were deleted so as not to reduce the potential utility of the measure. The overall RTMI demonstrated good internal consistency reliability (α= .81), and the Tucker Lewis Index was equal to .829. Correlations between factors are presented in Table 3.

Scale and composite means and standard deviations are reported in Table 4. Bivariate correlations conducted among RTMI scale and composite scores are presented in Table 5. The bivariate correlations between the subscales and composite ranged from weak to strong positive correlations (.12 < Pearson's r < .74; Table 5).

Table 2. Factor Loadings for Exploratory Factor Analysis with Promax Rotation of RTMI Items

	Factor			
Item Description	**1**	**2**	**3**	**4**
I eat meals at the same time every day	**.68**	-.08	.01	-.15
I plan my meals/snacks	**.68**	-.01	-.15	.02
I have a predictable schedule	**.57**	-.06	.15	-.08
I wake up around the same time every day	**.50**	-.08	.13	-.04
I go to bed at a time which allows an adequate amount of sleep	**.46**	-.18	.11	.12
I spend time planning my days or week	**.46**	.19	-.05	.15
I monitor my caloric intake or weight	**.40**	.15	-.22	.00
I spend time with friends or family regularly	-.09	**.76**	-.02	.08
I plan and/or participate in fun weekend activities	-.10	**.70**	-.03	.04
I talk to friends daily (in person or via phone/internet)	-.16	**.63**	.04	-.14
I talk with my parents or family members regularly	-.04	**.49**	.17	.01
I respond to calls in a timely manner	.01	**.45**	.11	.15
I participate in clubs or organizations	.04	**.42**	-.06	-.09
I volunteer my time or talents regularly	.16	**.36**	.01	-.08
I arrive on time for scheduled events with others	-.06	.06	**.76**	-.03
I arrive on time to obligations (e.g., class, meetings, work, appointments)	.01	.06	**.74**	.02
I am late for meetings or appointments*	-.11	-.03	**.71**	.02
I get dressed and ready in a timely manner	.24	.04	**.45**	.03
I wake up with enough time to get ready for the day†	**.36**	.02	**.43**	.00
I procrastinate on tasks I should complete*	.13	.03	.04	**.62**
Video games, internet, or television get in the way of my productivity*	-.01	.00	.06	**.56**
I put off doing laundry*	.15	-.05	-.07	**.40**
I depend on another adult for reminders (e.g., to make appointments or run errands)*	-.12	.00	.07	**.38**
I complete chores regularly	.19	.22	-.03	**.38**
Eigenvalue	2.46	2.40	2.22	1.47
% Variance	9.8	9.6	8.9	5.9

Note. † indicates item which loaded onto two factors. * indicates reverse-scored items.

Table 3. Factor Correlations

Factor	1	2	3	4
1	1			
2	.42	1		
3	.37	.22	1	
4	.38	.12	.25	1

Table 4. Descriptive Statistics of the Routines and Time Management Inventory for Young Adults

Scale	Items	Min., Max.	*M*	*SD*	Skew	Kurtosis	α
Daily Routines	7	7, 29	19.31	4.47	-.15	-.38	.79
Social Routines	7	10, 35	26.23	4.88	-.58	.23	.73
Time Management	5	10, 25	20.93	3.47	-.79	.08	.72
Procrastination Routines	6	7, 28	17.74	3.83	.05	-.29	.64
RTMI Total	25	49, 109	84.21	11.13	-.26	-.32	.81

Note. Min., Max. = Minimum and maximum observed scale scores.

Table 5. Intercorrelations Among the RTMI Subscales and Composites

Scale	Correlation (*r*)				
	Daily Routines	Social Routines	Time Management	Procrastination Routines	RTMI Composite
Daily Routines	1				
Social Routines	.27***	1			
Time Management	.35***	.25***	1		
Procrastination Routines	.31***	.12**	.26***	1	
RTMI Composite	.74***	.66***	.65***	.61***	1

Note. ** $p < .03$. ***$p < .001$

2.3 Phase III: Initial Validity Analyses

2.3.1 Method.

Participants. Participants for this phase of analyses were a subset of those described in Phase II, who had completed all measures to satisfaction. A total of 19 participants from Phase II were not included in Phase III due to missing data, resulting in 370 participants between the ages of 18 and 35. The descriptive statistics for this sample are detailed in Table 6, but do not meaningfully differ from those in Phase II.

Table 6. Demographic Information for RTMI Validity Analyses

Demographic Variables	Frequency	Percentage
N	370	
Age	*M* = 24.01 (5.40)	
Gender		
Female	285	77.0
Male	85	23.0
Academic Status		
Student	226	61.1
Not Student	144	38.9
Hispanic/ Non-Hispanic		
Hispanic	24	6.5
Non-Hispanic	346	93.5
Race		
Caucasian	317	85.7
Black/Af. Amer.	22	5.9
Asian/Pac. Islander	16	4.3
Multiple Races	10	2.7
Amer. Indian/Alaskan Native	4	1.1
Other	1	0.3
Education Level		
Less than High School	2	0.5
High School Graduate	84	22.7
Some College, No Degree	115	31.1
Associate Degree	10	2.7
Bachelor's Degree	88	23.8
Master's Degree	49	13.2
Doctoral Degree	15	4.1
Professional Degree	7	1.9
Employment		
Unemployed	101	27.3
Work <20 hours/week	102	27.6
Work 20-39 hours/week	42	11.4
Work Full-Time (40+hours)	125	36.5
Income		
$0-$4,999	155	41.9
$5,000-$9,999	15	4.1
$10,000-$14,999	20	5.4
$15,000-$24,999	24	6.5
$25,000-$34,999	21	5.7
$35,000-$49,999	21	5.7
$50,000-$74,999	41	11.1
$75,000-$99,999	28	7.6
$100,000+	43	11.6
Missing	2	0.5
Relationship Status		
Single	145	39.2

(table, cont'd.)

Demographic Variables	Frequency	Percentage
In a relationship	102	27.6
Living with partner	25	6.8
Married	95	25.7
Separated	1	0.3
Divorced	1	0.3
Widowed	1	0.3
Psychological Diagnoses		
No reported diagnoses	248	67.0
ADHD	25	6.8
Adjustment Disorder	1	0.3
Anxiety Disorder	32	8.6
Autism Spectrum Disorder	1	0.3
Bipolar Disorder	2	0.5
Depressive Disorder	10	2.7
Learning Disorder	4	1.1
Schizophrenia	2	0.5
Multiple disorders	42	11.4
Other	3	0.8

Measures. Participants completed the demographic questionnaire and items generated for the RTMI (Appendix B) as detailed in Phase II, as well as the measures which follow.

Time Structure Questionnaire (TSQ). The TSQ (Appendix D) was developed by Bond and Feather as a measure of the level to which individuals used their time in a structured and purposeful manner based on their own perceptions (1988). It contains 26 items rated on a seven-point scale ranging from *Yes, always* to *No, never*, with labels changing as necessary to fit the wording of the item. Some items are reverse-scored, so that higher scores on the TSQ indicates more time structure (Bond & Feather, 1988). Time structure is closely related to relevant aspects of time management discussed above, evidenced by the TSQ's factor structure. TSQ items map onto five factors: structured routine, sense of purpose, present orientation, effective organization, and persistence. Items include questions such as "Do you find during the day that you are often not sure what to do next?" and "Do you think you do enough with your time?" (Bond & Feather, 1988).

Bond and Feather's research with young adults has shown that TSQ total scores are positively correlated with self-esteem, optimism about the future, sense of purpose, reported health, and efficient study habits, while they are negatively correlated with depression, psychological distress, hopelessness, anxiety, and physical symptoms (1988). Although the original TSQ was a 17-item measure developed in 1983, initial research with the 26-item scale revised in 1988 found that test-retest reliability over 15-weeks for the total TSQ score was .76 across three samples of adults (Bond & Feather, 1988). In a study comparing the TSQ to the Time Management Behavior Scale, Chronbach's alpha coefficients for each of the TSQ's factors neared or exceeded .70 (Mudrack, 1997). Further, inter-item reliabilities ranged between .88 and .92, which provides evidence that the TSQ has high internal consistency and is adequately stable over time (Bond & Feather, 1988).

Satisfaction with Life Scale (SWLS). The SWLS (Appendix E) was developed in 1985 by Diener and colleagues as a measure of global cognitive judgements of satisfaction with a person's life (Diener et al., 1985). The scale contains five items measured on a seven-point scale, ranging from strong disagreement to strong agreement with each statement. An exemplar from the measure is, "I am satisfied with my life." All items are designed as an overall measure of life evaluation, a well-studied and integral part of the concept of subjective well-being, and scores from the SWLS are totaled and interpreted so higher scores indicate greater life satisfaction (Diener et al., 1985; OECD, 2013; Pavot & Diener, 2008). The SWLS has been translated into over 30 languages and was initially developed using two college student samples and a geriatric sample.

The initial test-retest correlation coefficient over two months was .82, and the coefficient alpha was .87 (Diener et al., 1985). More recently, research with the SWLS has produced data

supporting a coefficient alpha between .86 and .87, and test-retest reliability between .80 over one month, and .54 over a four-year span (Pavot & Diener, 2008). The scale has one factor which accounts for 66% of the variance and has demonstrated good internal consistency (Diener et al., 1985). Recently, a cross cultural confirmatory factor analysis was completed in the United States, Japan, and England, which supported the scale's measure of the same latent construct and validated the presence of a single factor (Whisman & Judd, 2016). The SWLS also appears to be a valid measure of life satisfaction, as research has shown that ratings of individuals in therapy increase over the course of therapy, while life satisfaction ratings decreased over time in a sample of spousal caregivers of Alzheimer's patients (Pavot, 2013). Further, the SWLS has a moderate to strong negative correlation with other clinical measures of distress such as the Beck Depression Inventory, and Symptom Checklist-90 (Pavot & Diener, 2008).

RAND 36-Item Health Survey 1.0 (SF-36). The SF-36 is a measure developed within a larger longitudinal study which measured differences in patient outcomes based on a number of healthcare variables, with the SF-36 specifically measuring overall health status and health-related quality of life. The RAND SF-36 (Appendix F; Hays, Sherbourne, & Mazel, 1993) contains the same items as those developed by Ware and Sherbourne (1992) through the Medical Outcomes Survey (MOS) and is publicly available. The MOS originally included nearly 2,500 participants on which the SF-36 and its derivatives were normed (Hays et al., 1993). The SF-36 has eight subscales which measure: physical functioning (10 items), bodily pain, role limitations due to physical health problems (4 items), role limitations due to emotional problems (3 items), social functioning (2 items), emotional well-being (5 items), energy/fatigue (4 items), health perceptions (5 items), and one item which measures perceived change in health status over the last year (Hays et al., 1993).

The measure was designed to be self-administered by people ages 14 and older (Hays et al., 1993). It has been used to study physical and psychological quality of life in numerous populations including those with a variety of illnesses (e.g., Multiple Sclerosis, cancer, diabetes), ages, and cultures, and is well validated (McHorney, Ware, Lu & Sherbourne, 1994). The reliability of the measure ranges between .65 and .94 across scales and varies somewhat based on the subpopulation (McHorney et al., 1994). The internal consistency for each scale is greater than .70, with the physical functioning scale ranging as high as .90 using the original scoring procedure (Hays, Sherbourne, & Mazel, 1995). The original scoring method of the measure is to create physical and mental component summary score; however, these scores were developed using principal components analysis with an orthogonal rotation, and have often been criticized, as there is little empirical support that mental and physical health are unrelated (Hagell, Westergren & Årestedt, 2017).

The authors who publish the RAND SF-36 suggest transposing the scores from 0-100 (where larger numbers indicate better health) and averaging the scores for each of the eight scales. While the entire SF-36 was administered, the primary scale of interest in the current study is the *Emotional well-being* scale, which consists of five items that measure symptoms associated with depression and anxiety (M=70.38, SD=21.97, α=.90; Hays et al., 1993). At the time of its publication there was no recommended method for combining scores into a single measure of quality of life, and neither a review of scoring techniques nor the organization's website has provided a method since that time (Hays et al., 1993; Hagell et al., 2017). Overall, strengths of this measure are its wide use across populations, good reliability, and validity.

Adult ADHD Self-Report Scale (ASRS). The ASRS (Appendix G; Kessler et al., 2005) is an 18-item diagnostic checklist of current symptoms based on DSM-IV-TR ADHD criteria. It

has two underlying subscales, in which nine items assess inattention and nine measure hyperactivity/impulsivity. The symptom frequency is rated on a five-point scale from 0 (*Never)* to 4 (*Very Often*; Kessler et al., 2005). The questionnaire takes approximately five minutes to complete, and answers can be categorized dichotomously with a cut-off score of nine out of eighteen items, or scored as a continuous variable (Taylor, Deb, & Unwin, 2011).

The ASRS was initially piloted as a symptoms checklist on a clinical sample of 60 adults diagnosed with ADHD and compared to clinicians' rating. (Adler, et al., 2006). The internal consistency for the ASRS is between .75 and .89, and the sensitivity and specificity is 56% and 98%, respectively, with a total classification accuracy of 96% (Adler et al., 2006; Kessler et al., 2005; Taylor et al., 2011). Thus, the measure is an apt screener for symptoms of ADHD.

Procedure. Data collection for this phase was the same as for Phase II. Participants were recruited through university and online sources, and they completed the measures as part of the RTMI study survey using Qualtrics. Data was analyzed using R software, including the psych package.

2.3.2 Results. To test the hypotheses related to the convergent and construct validity of the 25-item RTMI, correlational analyses were run on the data from the 370 previously described participants. Less than 2% of the variables were missing data. To prevent additional data loss, the sample mean for the variable was imputed in each of these few cases. Then, each of subscales and composite score of the RTMI were correlated with the overall score for the TSQ, SWLS, ASRS, and each of the scales for the RAND SF-36 (except the one-item perceived change scale). The most relevant scale to the current study is the *Emotional Well-being* scale on the RAND SF-36. The Pearson correlation coefficients for these analyses are displayed in Table 7. A Bonferroni correction was used to account for multiple comparisons.

As predicted in the second hypothesis, there was a strong correlation between the overall RTMI scores and the scores on the TSQ, $r(368) = .69$, $p < .001$. Further, there were moderate correlations between the TSQ and each of the scales of the RTMI. As predicted in the third hypothesis, there was a moderate positive correlation between the SWLS and RTMI scores, $r(368) = .49$, $p < .001$, as well as with each of the RTMI scales. Interestingly, aside from the total RTMI composite score, the *Social Routines* scale score had the strongest correlation with the SWLS, $r(368) = .40$, $p < .001$. The *Emotional Well-being* scale of the RAND SF-36 was positively correlated with the RTMI composite, $r(368) = .38$, $p < .001$, as predicted in the fourth hypothesis. Across the seven scale scores of the RAND SF-36 there were weak to moderate positive correlations with routines and time management as measured by the RTMI, and several of the scales related to physical symptoms were not significantly correlated with the RTMI. ADHD symptoms as measured by the ASRS produced a moderate negative correlation with the RTMI composite score, as predicted in the fifth hypothesis, $r(368) = -.39$, $p < .001$, with an even stronger negative correlation with the *Procrastination Routines* items on the RTMI, $r(368) = -.45$, $p<.001$.

Table 7. Correlations between RTMI Scales/Composite and Related Measures

Measure/Scale Name	Daily Routines	Social Routines	Time Management	Procrastination Routines	RTMI Total Score
TSQ	.51**	.37**	.42**	.58**	**.69****
SWLS	.33**	.40**	.24**	.32**	**.49****
ASRS	-.19**	-.14	-.30**	-.45**	**-.39****
SF-36: Physical Functioning	.05	.08	.10	.03	.09
SF-36: Role Limitations due to Physical Health	.05	.08	.17	.05	.12
SF-36: Role Limitations due to Emotional Problems	.11	.10	.22**	.23**	.24**
SF-36: Energy/Vitality	.29**	.33**	.23**	.31**	.44**

(table, cont'd)

Measure/Scale Name	Daily Routines	Social Routines	Time Management	Procrastination Routines	RTMI Total Score
SF-36: Emotional Well Being	.18*	.31**	.22**	.30**	**.38****
SF-36: Social Functioning	.15	.26**	.23**	.24**	.33**
SF-36: Pain	.09	.17	.15	.03	.16
SF-36: General Functioning	.29**	.27**	.24**	.25**	.40**

Note. Bolded *r* values reflect correlations noted in hypotheses. * $p<.05$, with a Bonferroni correction. ** $p<.03$, with a Bonferroni correction.

In addition to correlational analyses, we were interested in whether the RTMI would be able to distinguish people with ADHD from those without ADHD, as other measures of routines have been able to do in younger populations (e.g., Harris et al., 2013; Meyer, 2008). For this test, the ADHD group included for participants who had reported a diagnosis of ADHD, which included participants who reported only a diagnosis of ADHD ($n= 25$) and those who reported a diagnosis of ADHD along with other disorders ($n=16$) for total of 41 participants with ADHD. To confirm that a self-reported ADHD diagnosis was an appropriate criterion to use for delineating the groups, we verified that the ASRS scores measuring ADHD symptoms for the ADHD ($n=41$) and non-ADHD ($n=329$) groups were significantly different using a Welch's t-test. Welch's more robust version of the t-test is recommended for use, especially when sample sizes are unequal, as it calculates separate variances (Zimmerman, 2004). The results of the Welch's t-test showed that the ADHD group had significantly higher ASRS scores than the non-ADHD group (t (53.89) = 6.93, $p < .001$, $d = 1.04$, 95% CI [7.47, 13.55]). Following this confirmation, the RTMI total scores for the ADHD group were compared to the RTMI scores for the non-ADHD group using the same statistical test. The RTMI scores for the ADHD group were significantly lower than those for the non-ADHD group (t (47.79) = -.2.25, $p = 0.03$, $d = 0.42$, 95% CI [-8.71, -0.48]), which is indicative of fewer routines overall. Thus, the RTMI was successfully able to differentiate adults with ADHD from those without ADHD as predicted in

the hypotheses and showed a small to moderate practical significance evidenced by the effect size. The mean and standard deviation for each of the groups for the ASRS as well as the scales and composite scores of the RTMI are presented in Table 8.

Table 8. Descriptive Statistics of ADHD and Non-ADHD Groups

	ADHD (*n*= 41)		Non-ADHD (*n*= 329)	
	M	*SD*	*M*	*SD*
ASRS	38.86	9.01	28.35	10.29
Daily Routines	18.39	5.19	19.43	4.37
Social Routines	25.78	5.07	26.28	4.86
Time Management	19.56	4.23	21.10	3.33
Procrastination Routines	16.39	3.94	17.90	3.79
RTMI Total	80.12	12.52	84.72	10.85

Finally, additional analyses not included in the hypotheses were conducted to examine the convergent validity of the individual scales of the RTMI. Like the analyses above, Welch's t-tests were conducted to examine the differences for the ADHD and non-ADHD groups for each scale. The difference was nonsignificant between the two groups on the *Daily Routines* scale (t (47.33) = -1.23, p = .23, d = 0.23, 95% CI [-2.74, 0.66]), and on the *Social Routines* scale (t (49.61) = -0.60, p = .55, d = 0.10, 95% CI [-2.18, 1.18]). However, the ADHD group had scores significantly lower than the non-ADHD group on the *Time Management* scale of the RTMI (t (46.404) = -2.25, p = .03, d = 0.45, 95% CI [-2.92, -0.16]). Also, a significant difference was found on the *Procrastination Routines* scale (t (49.683) = -2.34, p = .02, d = 0.40, 95% CI [-2.82, -0.21]) where individuals with ADHD endorsed more procrastination and fewer productive routines than individuals without ADHD. These results suggest that *Time Management* and *Procrastination Routines* may be especially important factors and areas of difficulty for individuals with ADHD in the sample, evidenced by the effect sizes which indicate small to moderate practical significance.

Chapter 3. Discussion

The purpose of the current study was to develop a measure of routines and time management practices in younger adults. Routines were defined as observable behaviors that are repeated regularly within a specific context which help to automate activities, resulting in conservation of mental and physical resources (Zisberg et al., 2007). Time management strategies were defined as behaviors which promote efficient use of time during goal-directed activities (Claessens et al., 2007). These two concepts are intrinsically linked, and each requires the other to be effective; routines help to improve time use, and time management is necessary for creating and executing routines. The overarching EF system subsumes both constructs. Routines and time management strategies are considered beneficial because they help can serve to provide stability, structure, and a sense of control to individuals and families. In disorders where the EF system is compromised, such as with neurodevelopmental disorders or injury, increased routines and structure is often prescribed as a nonpharmaceutical treatment for improving a person's livelihood. Even in other disorders, such as Major Depressive Disorder, routines are often impaired, as evident in the diagnostic criteria which includes insomnia or hypersomnia (APA, 2013).

One of the more common disorders where impaired routines and time management are often observed is ADHD. Previous measures of routines have been able to distinguish children and adolescents with ADHD from those without ADHD (Meyer, 2008; Sytsma et al., 2001). However, while there are existing measures of routines in children, families, adolescents, and older adults, there was a large gap in the literature of measures for individuals older than adolescents, but not yet retirement age. Thus, the goal of developing the RTMI was to create an

empirically derived measure to expand available measures while including assessment of closely related time management strategies.

3.1 Measure Development and Initial Validation

Phase I of the study focused on creating a comprehensive list of potential items to include in the initial RTMI measure. Items were generated by examining consistent themes in the literature, adapting appropriate items from existing measures, and informally interviewing adults in the relevant age range about their own daily habits. This process of item generation utilized theorized dimensions of routines and time management related routines and resulted in 80 items. After preliminary feedback was received, the item pool was further reduced. Then, items were rated by eight reviewers based on their relevancy and cohesiveness with the goal of the measure, and items with below average ratings were deleted. This resulted in 54 items which were included in phase II of the study (Appendix B).

In phase II, participants were recruited primarily through online social media posts, word-of-mouth, and the university's participant pool. They were asked to complete each of the measures included in the online survey which included a demographic survey, the RTMI items, an established measure of time structure (i.e., TSQ), a measure related to satisfaction with life (i.e., SWLS), a health-related quality of life measure (i.e., RAND SF-36), and a measure of ADHD symptoms (i.e., ASRS). The number of participants who passed the included validity checks and completed each of the measures was considerably lower than the number who began the survey, but still sufficient for analyses. Initial data analysis included examining the descriptive statistics and distributions of each individual item, as well as the item-total correlations. Following initial review and reduction, a parallel analysis and subsequent factor

analyses were conducted to determine which items had statistical evidence for remaining part of the measure and to determine the latent structure of the items in the RTMI.

Although it was hypothesized that there would be five factors in the RTMI, a 5-factor solution was not statistically supported. Instead, the most promising factor solutions were the 3-factor and 4-factor solutions. Ultimately, the 4-factor solution was chosen as the preferred factor solution for the RTMI and 25 items were retained in the measure (Appendix J). The first factor of the RTMI is the seven-item *Daily Routines* factor which consisted of items related to daily tasks such as sleeping, eating, and scheduling. The *Social Routines* factor is seven items which measure communication habits and participation in social or community activities. *Time Management* emerged as the third factor with five items relating to planning and timeliness. Finally, the fourth factor was labeled *Procrastination Routines* and consisted of six items related to reverse-scored items related to interfering activities, as well as productive activities primarily in the home atmosphere.

Three of the four subscales of the RTMI demonstrated adequate internal consistency, while the *Procrastination Routines* scale exhibited questionable internal consistency. The overall RTMI composite demonstrated good internal consistency. All scales had moderate intercorrelations with one another, except for *Procrastination Routines* and *Social Routines* which showed a weak correlation, although a weak relationship between these two constructs is theoretically foreseeable. All four factors had strong correlations with the overall RTMI composite, making it the best overall assessment of routines and time management, while each of the scales provide unique information which may be important to areas of particular interest or intervention within related areas of routines and time management.

In Phase III the remaining hypotheses were tested to validate that the measure behaved as predicted when compared to existing related measures. Research has shown that greater routine regularity is associated with higher levels of life satisfaction, and overall well-being, while more irregular routines are correlated with an array of negative mental and physical health outcomes (Margraf et al., 2016). Thus, it was hypothesized the RTMI would correlate positively with the SWLS, RAND SF-36, as well as the TSQ which is an established measure of time structure, closely related to routines and time management. It was also predicted that the RTMI would be negatively correlated with symptoms of ADHD as measures on the ASRS, and that the RTMI would be able to distinguish individuals with ADHD from those without ADHD, as other measures of routines have done in younger populations. As hypothesized, the RTMI showed a strong positive association with time structure (i.e., TSQ), moderate positive associations with life satisfaction (i.e., SWLS), and emotional well-being (i.e., RAND SF-36). These relationships suggest that with increased routines and time management, individuals also show higher levels of life satisfaction, lower levels of depression/anxiety (i.e., positive emotional well-being), and increased time structure. Further, the RTMI correlated negatively with higher levels of endorsed ADHD symptoms on the ASRS, suggesting that participants who reported more severe symptoms of inattention, hyperactivity, and impulsivity also reported less frequent or consistent routines and time management practices. In addition to a correlational analysis, the RTMI total score was able to successfully differentiate a subsample of adults with self-reported diagnoses of ADHD from individuals without ADHD which provided support for the final hypothesis and aligns with previous findings for measures of routines in younger populations (e.g., Meyer, 2008; Sytsma et al., 2001). To further explore the scales developed during the factor analysis, additional tests of statistical significance were conducted to determine the utility of individual

scales in distinguishing participants with ADHD from those without ADHD. Results indicated that the *Daily Routines* and *Social Routines* scales were not significantly different across the two groups, as shown by nonsignificant t-tests and small effect sizes. There was a statistical and practical significance shown by both the *Time Management* and *Procrastination Routines* scales of the RTMI, suggesting that these factors may be better measures of behaviors that are impacted by ADHD symptoms. Overall, the convergent validity of the RTMI was supported in the analyses comparing the items of the new measure to existing assessments as well as through comparing subgroups of participants.

Taken together, the results of this study provide preliminary evidence that the RTMI is a practical, theoretically supported, and valid measure of multidimensional routines and time management in younger adults. It was developed using a sample of adults aged 18-35, with characteristics ranging from high school graduate to post-graduate degree recipient, unemployed to fully employed, and single to married. Overall, the RTMI appears to be an adequate instrument for use in its intended population.

3.2 Limitations and Future Directions

Despite the strengths of the results, the current study has a number of limitations. One chief concern was the biased nature of the sample. Although this study captured a variety of ages and lifestyles (e.g. related to employment, relationship status, and education), the participants in this study were predominantly Caucasian and female. Student participants from the university's psychology participant pool were expected to be mostly female, given the typical demographics of the major. It is also possible that females may be more likely to participate in studies posted to social media. Therefore, the current sample's homogeneity may have affected the frequency and variability of items endorsed and may not be representative of males or non-Caucasian

individuals. Future studies aiming to refine the development of the RTMI should seek to obtain reliability and validity data using a more heterogeneous sample regarding race/ethnicity and sex.

Although online survey attrition and careless responding are known risks to online survey data collection, they can introduce bias to the data and influence factor structure (Huang, et al., 2012; Ward, et al., 2017). We attempted to address this problem by offering incentives for completion, and by removing data for participants who did not pass included attention checks. As a result, the number of participants who provided useable data was considerably fewer than the number of participants who began the study. Future studies employing the RTMI may address this shortcoming by using different recruitment techniques (e.g., in person, or using online survey companies which assure quality responses) so as not to lose important data.

Another limitation of the current study involves the psychometrics of the RTMI factors. The fourth factor derived from the data, *Procrastination Routines,* exhibited questionable internal consistency. This factor was ultimately included because it approached acceptable internal consistency, and because the current study goal was to develop the RTMI rather than to validate its structure. Thus, it was retained for future studies which should work towards confirming the factor structure. Furthermore, the RTMI scales together accounted for a limited amount of the variance in the population. While the 4-factor solution was chosen because it performed slightly better with the current data, the 3-factor solution was similar in many ways. Thus, it may be beneficial to include items other than the 25 remaining items to consider both a three and four factor solution in future validation studies.

The RTMI was successful in distinguishing those with ADHD from those without ADHD in the current sample; however, the subsample of participants with self-reported ADHD was small. Further, the current study relied on self-reported diagnoses, as opposed to obtaining proof

of diagnosis or including a diagnostic process. These are both limitations to the current study that could be addressed in future studies. Future studies should gather a more clinical and rigorously diagnosed sample so that the findings of the current study may be confirmed, and with the goal of establishing interpretation guidelines and cutoff scores for the RTMI. It would be beneficial for future researchers to include information related to other clinical populations where routines and time management are frequently disturbed as well. Nevertheless, the RTMI in its current form can provide clinical utility informally through the identification of different areas of routine which may be compromised in individuals with ADHD or other disorders. The RTMI may be used by practitioners to identify and target maladaptive or disordered routines at the outset of treatment and could then be used as a progress monitoring measure.

Overall, many of these limitations can and should be addressed in future studies to refine and validate the factor structure of the RTMI. The age range of this population is difficult to assess in the area of routines due to the diversity of life styles at this developmental stage. However, despite the aforementioned limitations of this study, the RTMI appears to provide otherwise unmeasured information related to routines and time management practices in younger adults, a population neglected by similar measures in the past.

References

Abikoff, H., Gallagher, R., Wells, K. C., Murray, D. W., Huang, L., Lu, F., & Petkova, E. (2013). Remediating organizational functioning in children with ADHD: Immediate and long-term effects from a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *81*(1), 113–128. doi:10.1037/a0029648

Adler, L. A., Spencer, T., Faraone, S. V., Kessler, R. C., Howes, M. J., Biederman, J., & Secnik, K. (2006). Validity of Pilot Adult ADHD Self-Report Scale (ASRS) to Rate Adult ADHD Symptoms. *Annals of Clinical Psychiatry*, *18*(3), 145-148. doi:10.1080/10401230600801077

Advokat, C., Lane, S. M., & Luo, C. (2011). College students with and without ADHD: Comparison of self-report of medication usage, study habits, and academic achievement. *Journal of Attention Disorders*, *15*(8), 656-666. doi:10.1177/1087054710371168

Alderson, R. M., Kasper, L. J., Hudec, K. L., & Patros, C. G. (2013). Attention-deficit/hyperactivity disorder (ADHD) and working memory in adults: A meta-analytic review. *Neuropsychology*, *27*(3), 287-302. doi:10.1037/a0032371

Allee-Smith, P. J., Winters, R. R., Drake, A., & Joslin, A. K. (2013). Review of Barkley deficits in executive functioning scale (BDEFS). *Journal of Psychoeducational Assessment*, *31*(1), 80-83.

American Psychiatric Association. (2013). Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA: American Psychiatric Publishing.

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*(5), 469-480. doi:10.1037/0003-066X.55.5.469

Atwood, J. D., & Scholtz, C. (2008). The quarter-life time period: An age of indulgence, crisis or both?. *Contemporary Family Therapy: An International Journal*, *30*(4), 233-250. doi:10.1007/s10591-008-9066-2

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychological Bulletin, 121,* 65-94. doi: 1f0.1037/0033-2909.121.1.65

Barkley, R. A. (2011). *The Barkley Deficits in Executive Functioning Scale.* New York, NY: Guilford Press.

Barkley, R. A. (2012). Distinguishing sluggish cognitive tempo from attention-deficit/hyperactivity disorder in adults. *Journal of Abnormal Psychology, 121,* 978-990. doi:10.1037/a0023961

Barkley, R. A., Koplowitz, S., Anderson, T., & McMurray, M. B. (1997). Sense of time in children with ADHD: effects of duration, distraction, and stimulant medication. *Journal of the International Neuropsychological Society, 3*, 359-369.

Barkley, R. A., & Murphy, K. R. (2011). The nature of executive function (EF) deficits in daily life activities in adults with ADHD and their relationship to performance on EF tests. *Journal of Psychopathology and Behavioral Assessment, 33*(2), 137-158.

Barkley, R. A., Murphy, K. R., & Bush, T. (2001). Time perception and reproduction in young adults with attention deficit hyperactivity disorder. *Neuropsychology, 15*, 351-360.

Bentley, E. (2007). *Adulthood*. London: Routledge.

Biederman, J., Faraone, S. V., Spencer, T. J., Mick, E., Monuteaux, M. C., & Aleardi, M. (2006). Functional impairments in adults with self-reports of diagnosed ADHD: A controlled study of 1001 adults in the community. *The Journal of Clinical Psychiatry, 67*(4), 524-540. doi:10.4088/JCP.v67n0403

Biederman, J., Petty, C. R., Evans, M., Small, J., & Faraone, S. V. (2010). How persistent is ADHD? A controlled 10-year follow-up study of boys with ADHD. *Psychiatry Research, 177*(3), 299-304. doi:10.1016/j.psychres.2009.12.010

Bikic, A., Reichow, B., McCauley, S. A., Ibrahim, K., & Sukhodolsky, D. G. (2017). Meta-analysis of organizational skills interventions for children and adolescents with Attention-Deficit/Hyperactivity Disorder. *Clinical Psychology Review, 52*, 108–123. doi:10.1016/j.cpr.2016.12.004

Bond, M. J., & Feather, N. T. (1988). Some correlates of structure and purpose in the use of time. *Journal of Personality and Social Psychology, 55*(2), 321-329. doi:10.1037/0022-3514.55.2.321

Bridley, A., & Sytsma-Jordan, S. (2012). Child routines moderate daily hassles and children's psychological adjustment. *Children's Health Care, 41*(2), 129-144. doi:10.1080/02739615.2012.657040

Britton, B. K., & Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology, 83*(3), 405-410. doi:10.1037/0022-0663.83.3.405

FCarney, C. E., Edinger, J. D., Meyer, B., Lindman, L., & Istre, T. (2006). Daily activities and sleep quality in college students. *Chronobiology International, 23*(3), 623-637. doi:10.1080/07420520600650695

Carrà, G., Sciarini, P., Segagni-Lusignani, G., Clerici, M., Montomoli, C., & Kessler, R. C. (2011). Do they actually work across borders? Evaluation of two measures of

psychological distress as screening instruments in a non-Anglo-Saxon country. *European Psychiatry*, *26*(2), 122-127. doi:10.1016/j.eurpsy.2010.04.008

Chacko, A., Alan, C., Uderman, J., Cornwell, M., Anderson, L., & Chimiklis, A. (2015). Training parents of children with ADHD. In R. A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (pp. 710-739). New York, NY: Guilford Publications.

Claessens, B. J., Van Eerde, W., Rutte, C. G., & Roe, R. A. (2007). A review of the time management literature. *Personnel review*, *36*(2), 255-276.

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*(3), 309-319. doi:10.1037/1040-3590.7.3.309

Coffman, T.P. (2014). *The psychometric properties of the Barkley deficits in executive functioning scale (BDEFS) in a college student population* (Doctoral Dissertation). Retrieved from http://purl.flvc.org/fsu/fd/FSU_migr_etd-8961

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical assessment, research & evaluation*, *10*(7), 1-9.

Craig, F., Margari, F., Legrottaglie, A. R., Palumbi, R., de Giambattista, C., & Margari, L. (2016). A review of executive function deficits in autism spectrum disorder and attention-deficit/hyperactivity disorder. *Neuropsychiatric Disease and Treatment*, *12*, 1191–1202.

Crespo, C., Santos, S., Canavarro, M. C., Kielpikowski, M., Pryor, J., & Féres-Carneiro, T. (2013). Family routines and rituals in the context of chronic conditions: A review. *International Journal of Psychology*, *48*(5), 729-746. doi:10.1080/00207594.2013.806811

De Almondes, K. M., & Araujo, J. F. (2011). Sleep quality and daily lifestyle regularity in workers with different working hours. *Biological Rhythm Research*, *42*(3), 231-245. doi:10.1080/09291016.2010.509480

Dehili, V. M., Prevatt, F., & Coffman, T. P. (2017). An analysis of the Barkley Deficits in Executive Functioning Scale in a college population: Does it predict symptoms of ADHD better than a visual-search task?. *Journal of Attention Disorders*, *21*(7), 567-574. doi:10.1177/1087054713498932

DeVellis, R. F. (2017). *Scale development: Theory and applications*, (4th ed) Los Angeles, CA: Sage Publications.

Diamond, A. (2013). Executive functions. *Annual review of psychology, 64*, 135-168.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49,* 71-75.

Dove, M. K., Neuharth-Pritchett, S., Wright, D. W., & Wallinga, C. (2015). Parental involvement routines and Former Head Start children's literacy outcomes. *Journal of Research in Childhood Education, 29*(2), 173-186. doi:10.1080/02568543.2015.1011360

Duncan, M. J., Kline, C. E., Rebar, A. L., Vandelanotte, C., & Short, C. E. (2016). Greater bed- and wake-time variability is associated with less healthy lifestyle behaviors: A cross-sectional study. *Journal of Public Health, 24*(1), 31-40. doi:10.1007/s10389-015-0693-4

Dvorsky, M. R., & Langberg, J. M. (2014). Predicting impairment in college students with ADHD. *Journal of Attention Disorders,* Advanced online copy. doi:10.1177/1087054714548037

Eakin, L., Minde, K., Hechtman, L., Ochs, E., Krane, E., Bouffard, R., ... & Looper, K. (2004). The marital and family functioning of adults with ADHD and their spouses. *Journal of Attention Disorders, 8*(1), 1-10.

Ek, A., & Isaksson, G. (2013). How adults with ADHD get engaged in and perform everyday activities. *Scandinavian Journal of Occupational Therapy, 20*(4), 282-291.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological methods, 4*(3), 272-299.

Fairchild, G., van Goozen, S. H. M., Stollery, S. J., Aitken, M. R. F., Savage, J., Moore, S. C., & Goodyer, I. M. (2009). Decision making and executive function in male adolescents with early-onset or adolescence-onset conduct disorder and control subjects. *Biological Psychiatry, 66*(2), 162–168. doi:10.1016/j.biopsych.2009.02.024

Firmin, M. W., & Phillips, A. (2009). A qualitative study of families and children possessing diagnoses of ADHD. *Journal of Family Issues, 30*(9), 1155-1174. doi:10.1177/0192513X09333709

Floyd, F.J., & Widaman, K.F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7,* 286-299.

George, D., Dixon, S., Stansal, E., Gelb, S. L., & Pheri, T. (2008). Time diary and questionnaire assessment of factors associated with academic and personal success among university undergraduates. *Journal of American College Health, 56(6),* 706-715. doi:10.3200/JACH.56.6.706-715

Goodman, W. K., Geiger, A. M., & Wolf, J. M. (2017). Leisure activities are linked to mental health benefits by providing time structure: Comparing employed, unemployed and

homemakers. *Journal of Epidemiology and Community Health, 71*(1), 4-11. doi:10.1136/jech-2016-207260

Hagell, P., Westergren, A., & Årestedt, K. (2017). Beware of the origin of numbers: Standard scoring of the SF-12 and SF-36 summary measures distorts measurement and score interpretations. *Research in Nursing & Health, 40*(4), 378-386. doi:10.1002/nur.21806

Harris, A. N., Stoppelbein, L., Greening, L., Becker, S. P., Luebbe, A., & Fite, P. (2013). Child routines and parental adjustment as correlates of internalizing and externalizing symptoms in children diagnosed with ADHD. *Child Psychiatry & Human Development, 45*(2), 243-253. doi: 10.1007/s10578-013-0396-4

Hays, R. D., Sherbourne, C. D. and Mazel, R. M. (1993), The RAND 36-item health survey 1.0. *Health Economics, 2,* 217–227. doi:10.1002/hec.4730020305

Hays, R. D., Sherbourne, C. D., & Mazel, R. M. (1995). *User's manual for the Medical Outcomes Study (MOS) core measures of health-related quality of life*. Rand Corporation.

Hellsten, L. A. M. (2012). What do we know about time management? A review of the literature and a psychometric critique of instruments assessing time management. In *Time management*. Intech.

Huang, J. L., Curran, P. G., Keeney, J., Poposki, E. M., & DeShon, R. P. (2012). Detecting and deterring insufficient effort responding to surveys. *Journal of Business and Psychology, 27*(1), 99-114. doi:10.1007/s10869-011-9231-8

Israel, A. C., Roderick, H. A., & Ivanova, M. Y. (2002). A measure of the stability of activities in a family environment. *Journal of Psychopathology and Behavioral Assessment, 24*(2), 85-95. doi:10.1023/A:1015336707701

Jensen, E. W., James, S. A., Boyce, W. T., & Hartnett, S. A. (1983). The family routines inventory: Development and validation. *Social Science & Medicine, 17*(4), 201-211. doi:10.1016/0277-9536(83)90117-X

Kenworthy, L., Yerys, B. E., Anthony, L. G., & Wallace, G. L. (2008). Understanding executive control in autism spectrum disorders in the lab and in the real world. *Neuropsychology Review, 18*(4), 320-338. doi:10.1007/s11065-008-9077-7

Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., & ... Walters, E. E. (2005). The World Health Organization adult ADHD self-report scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*(2), 245-256. doi:10.1017/S0033291704002892

Kessler, R. C., Adler, L., Barkley, R., Biederman, J., Conners, C. K., Demler, O., . . . Zaslavsky, A. M. (2006). The prevalence and correlates of adult ADHD in the United States: results

from the National Comorbidity Survey Replication. *American Journal of Psychiatry, 163(*4*)*, 716-723. doi: 10.1176/appi.ajp.163.4.716

Kiser, L. J., Bennett, L., Heston, J., & Paavola, M. (2005). Family ritual and routine: Comparison of clinical and non-clinical families. *Journal of Child and Family Studies, 14*(3), 357-372.

Kohyama, J. (2016). Good daily habits during the early stages of life determine success throughout life. *Sleep Science, 9,* 153-157.

Koome, F., Hocking, C., & Sutton, D. (2012). Why routines matter: The nature and meaning of family routines in the context of adolescent mental illness. *Journal of Occupational Science, 19*, 312-325.

LaCount, P. A., Hartung, C. M., Shelton, C. R., & Stevens, A. E. (2015). Efficacy of an organizational skills intervention for college students with ADHD symptomatology and academic difficulties. *Journal of Attention Disorders*. Advance online publication. doi:10.1177/1087054715594423

Lanza, H. I., & Drabick, D. A. (2011). Family routine moderates the relation between child impulsivity and oppositional defiant disorder symptoms. *Journal of abnormal child psychology, 39*(1), 83-94.

Lemola, S., Ledermann, T., & Friedman, E. M. (2013). Variability of sleep duration is related to subjective sleep quality and subjective well-being: An actigraphy study. *Plos ONE, 8*(8), e71292. doi: 10.1371/journal.pone.0071292

Lezak, M. D., Howieson, D. B., Loring, D. W., Hannay, H. J., & Fischer, J. S. (2004). *Neuropsychological assessment., 4th ed*. New York, NY, US: Oxford University Press.

Lindstedt, H., & Umb-Carlsson, Õ. (2013). Cognitive assistive technology and professional support in everyday life for adults with ADHD. *Disability and Rehabilitation: Assistive Technology, 8*(5), 402-408.

Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology, 79*(3), 381-391. doi:10.1037/0021-9010.79.3.381

Macan, T., Gibson, J. M., & Cunningham, J. (2010). Will you remember to read this article later when you have time? The relationship between prospective memory and time management. *Personality and Individual Differences, 48*(6), 725-730.

Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology, 82*(4), 760-768. doi:10.1037/0022-0663.82.4.760

Magalhães, S. C., Souza, C. V., Dias, T. R., de Bruin, P. C., & de Bruin, V. S. (2005). Lifestyle regularity measured by the social rhythm metric in Parkinson's disease. *Chronobiology International, 22*(5), 917-924. doi:10.1080/07420520500263334

Malatras, J. W., & Israel, A. C. (2013), The influence of family stability on self-control and adjustment. *Journal of Clinical Psychology, 69*: 661–670. doi:10.1002/jclp.21935

Malatras, J. W., Israel, A. C., Sokolowski, K. L., & Ryan, J. (2016). First things first: Family activities and routines, time management and attention. *Journal of Applied Developmental Psychology, 47*, 23-29.

Manczak, E. M., Williams, D., & Chen, E. (2017). The role of family routines in the intergenerational transmission of depressive symptoms between parents and their adolescent children. *Journal of Abnormal Child Psychology, 45*(4), 643-656. doi:10.1007/s10802-016-0187-z

Marchetta, N. J., Hurks, P. M., Krabbendam, L., & Jolles, J. (2008). Interference control, working memory, concept shifting, and verbal fluency in adults with attention-deficit/hyperactivity disorder (ADHD). *Neuropsychology, 22*(1), 74-84. doi:10.1037/0894-4105.22.1.74

Margraf, J., Lavallee, K., Zhang, X., & Schneider, S. (2016). Social rhythm and mental health: A cross- cultural comparison. *PLoS ONE 11(3*): e0150312. doi:10.1371/journal.pone.0150312

Martel, M. M., von Eye, A., & Nigg, J. (2012). Developmental differences in structure of attention-deficit/hyperactivity disorder (ADHD) between childhood and adulthood. *International Journal of Behavioral Development, 36*(4), 279-292. doi: 10.1177/0165025412444077

McHorney, C. A., Ware Jr, J. E., Lu, J. R., & Sherbourne, C. D. (1994). The MOS 36-item Short-Form Health Survey (SF-36): III. Tests of data quality, scaling assumptions, and reliability across diverse patient groups. *Medical care*, 40-66.

Merikangas, K. R., He, J. P., Brody, D., Fisher, P. W., Bourdon, K., & Koretz, D. S. (2010). Prevalence and treatment of mental disorders among US children in the 2001–2004 NHANES. *Pediatrics*, *125*(1), 75-81.

Meyer, K. (2008). *Development and validation of the Adolescent Routines Questionnaire: Parent and self-report* (Unpublished doctoral dissertation). Louisiana State University, Baton Rouge, Louisiana.

Meyer, K., & Kelley, M. L. (2007). Improving homework in adolescents with attention-deficit/hyperactivity disorder: Self vs. parent monitoring of homework behavior and study skills. *Child & Family Behavior Therapy*, *29*(4), 25-42. doi:10.1300/J019v29n04_02

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies, 16(1),* 41-51.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive psychology*, *41*(1), 49-100.

Monk, T. K., Flaherty, J. F., Frank, E., Hoskinson, K., & Kupfer, D. J. (1990). The Social Rhythm Metric: An instrument to quantify the daily rhythms of life. *Journal of Nervous and Mental Disease*, *178*(2), 120-126. doi:10.1097/00005053-199002000-00007

Monk, T. H., Kupfer, D. J., Frank, E., & Ritenour, A. M. (1991). The Social Rhythm Metric (SRM): Measuring daily social rhythms over 12 weeks. *Psychiatry Research*, *36*(2), 195-207. doi:10.1016/0165-1781(91)90131-8

Mudrack, P. E. (1997). The structure of perceptions of time. *Educational and Psychological Measurement*, *57*(2), 222-240. doi:10.1177/0013164497057002003

Munro, B. A., Weyandt, L. L., Marraccini, M. E., & Oster, D. R. (2017). The relationship between nonmedical use of prescription stimulants, executive functioning and academic outcomes. *Addictive Behaviors*, *65*, 250-257. doi:10.1016/j.addbeh.2016.08.023

Murphy, P., & Schachar, R. (2000). Use of self-ratings in the assessment of symptoms of attention deficit hyperactivity disorder in adults. *The American Journal of Psychiatry*, *157*(7), 1156-1159. doi:10.1176/appi.ajp.157.7.1156

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. Thousand Oaks, CA: Sage Publications.

Nigg, J. T. (2013a). Attention-deficit/hyperactivity disorder. In T. P. Beauchaine & S. P. Hinshaw (Eds.), *Child and adolescent psychopathology*. (2nd ed.) (pp. 377-409). Hoboken, NJ: John Wiley & Sons Inc.

Nigg, J. T. (2013b). Attention-deficit/hyperactivity disorder and adverse health outcomes. *Clinical Psychology Review*, *33*(2), 215-228. doi:10.1016/j.cpr.2012.11.005

OECD (2013), *OECD Guidelines on Measuring Subjective Well-being*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264191655-en

Pavot, W. (2013). The validity and utility of global measures of subjective well-being. *Polish Psychological Bulletin*, *44*(2), 50-58. doi:10.2478/ppb-2013-0020

Pavot, W., & Diener, E. (2008). The satisfaction with life scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology, 3*(2), 137-152. doi:10.1080/17439760701756946

Puente, A. N., & Mitchell, J. T. (2016). Cognitive-behavioral therapy for adult ADHD: A case study of multi-method assessment of executive functioning in clinical practice and manualized treatment adaptation. *Clinical Case Studies, 15*(3), 198-211. doi:10.1177/1534650115614098

R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/

Revelle, W. (2017) psych: Procedures for Personality and Psychological Research, Northwestern University, Evanston, Illinois, USA, URL: https://CRAN.R-project.org/package=psych Version = 1.7.8.

Richards, T. L., Rosén, L. A., & Ramirez, C. A. (1999). Psychological functioning differences among college students with confirmed ADHD, ADHD by self-report only, and without ADHD. *Journal of College Student Development, 40*(3), 299-304.

Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, *130*(2), 261-288. doi:10.1037/0033-2909.130.2.261

Roberts, W., Milich, R., & Barkley, R. A. (2015). Primary symptoms, diagnostic criteria, subtyping, and prevalence of ADHD. In R. A. Barkley, (Ed.) *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (pp. 51-80). New York, NY, US: Guilford Press.

Robin, A. (2015). Training families of adolescents with ADHD. In R. A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York, NY: Guilford Publications.

Simon, V., Czobor, P., Bálint, S., Mészáros, Á., & Bitter, I. (2009). Prevalence and correlates of adult attention-deficit hyperactivity disorder: Meta-analysis. *The British Journal of Psychiatry, 194*(3), 204-211.

Solanto, M. V. (2015) Executive function deficits in adults with ADHD. In R. A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (pp. 710-739). New York, NY: Guilford Publications.

Smith, E. E., & Jonides, J. (1999). Storage and executive processes in the frontal lobes. *Science, 283*, 1657-1661.

Stilley, C. S., Bender, C. M., Dunbar-Jacob, J., Sereika, S., & Ryan, C. M. (2010). The impact of cognitive function on medication management: Three studies. *Health Psychology*, *29*(1), 50-55. doi:10.1037/a0016940

Sytsma, S. E., Kelley, M. L., & Wymer, J. H. (2001). Development and initial validation of the Child Routines Inventory. *Journal of Psychopathology and Behavioral Assessment*, *23*(4), 241-251. doi:10.1023/A:1012727419873

Taylor, A., Deb, S., & Unwin, G. (2011). Scales for the identification of adults with attention deficit hyperactivity disorder (ADHD): A systematic review. *Research in Developmental Disabilities*, *32*(3), 924-938. doi:10.1016/j.ridd.2010.12.036

Tighe, C. A., Dautovich, N. D., & McCrae, C. S. (2016). Daily social contact in relation to sleep: The role of age. *Behavioral Sleep Medicine*, *14*(3), 311-324. doi:10.1080/15402002.2015.1007990

Toner M., O'Donoghue T., & Houghton S. (2006) Living in chaos and striving for control: how adults with attention deficit hyperactivity disorder deal with their disorder. *International Journal of Disability, Development, and Education 53,* 247–261.

Trockel, M. T., Barnes, M. D., & Egget, D. L. (2000). Health-related variables and academic performance among first-year college students: Implications for sleep and other behaviors. *Journal of American College Health*, *49*(3), 125-131. doi:10.1080/07448480009596294

Van Hoye, G., & Lootens, H. (2013). Coping with unemployment: Personality, role demands, and time structure. *Journal of Vocational Behavior*, *82*(2), 85-95. doi:10.1016/j.jvb.2013.01.004

Vélez-Pastrana, M. C., González, R. A., Rodríguez Cardona, J., Purcell Baerga, P., Alicea Rodríguez, Á., & Levin, F. R. (2016). Psychometric properties of the Barkley deficits in executive functioning scale: A Spanish-language version in a community sample of Puerto Rican adults. *Psychological Assessment*, *28*, 483-498. doi:10.1037/pas0000171

Vodanovich, S. J., & Watt, J. D. (1999). The relationship between time structure and boredom proneness: An investigation within two cultures. *The Journal of Social Psychology*, *139*(2), 143-152. doi:10.1080/00224549909598368

Ward, M. K., Meade, A. W., Allred, C. M., Pappalardo, G., & Stoughton, J. W. (2017). Careless response and attrition as sources of bias in online survey assessments of personality traits and performance. *Computers in Human Behavior*, *76*417-430. doi:10.1016/j.chb.2017.06.032

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care*, 473-483.

Weisner, T. S. (2010). Well-being, chaos, and culture: Sustaining a meaningful daily routine. In G. W. Evans, T. D. Wachs (Eds.), *Chaos and its influence on children's development: An ecological perspective* (pp. 211-224). Washington, DC, US: American Psychological Association. doi:10.1037/12057-013

Weyandt, L. L., & Gudmundsdottir, B. G. (2015). Developmental and neuropsychological deficits in children with ADHD. In R. A. Barkley (Ed.), *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York, NY: Guilford Publications.

Whisman, M. A., & Judd, C. M. (2016). A cross-national analysis of measurement invariance of the satisfaction with life scale. *Psychological Assessment*, *28*(2), 239-244. doi:10.1037/pas0000181

Whiting, W. L., & Murdock, K. K. (2016). Emerging adults' sleep patterns and attentional capture: the pivotal role of consistency. *Cognitive processing, 17(2),* 155-162.

Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/hyperactivity disorder: a meta-analytic review. *Biological Psychiatry*, *57*, 1336-1346. doi: 10.1016/j.biopsych.2005.02.006

Willcutt, E. G., Nigg, J. T., Pennington, B. F., Solanto, M. V., Rohde, L. A., Tannock, R., . . . Lahey, B. B. (2012). Validity of DSM-IV attention deficit/hyperactivity disorder symptom dimensions and subtypes. *Journal of Abnormal Psychology, 121*, 991-1010. doi: 10.1037/a002

Wood, W. M., Lewandowski, L. J., Lovett, B. J., & Antshel, K. M. (2017). Executive dysfunction and functional impairment associated with sluggish cognitive tempo in emerging adulthood. *Journal of Attention Disorders*, *21*(8), 691-700. doi:10.1177/1087054714560822

Zimmerman, D. W. (2004). A note on preliminary tests of equality of variances. *British Journal of Mathematical and Statistical Psychology*, *57*(1), 173-181. doi:10.1348/000711004849222

Zisberg, A., Young, H. M., & Schepp, K. (2009). Development and psychometric testing of the scale of older adults' routine. *Journal of Advanced Nursing*, *65*(3), 672-683. doi:10.1111/j.1365-2648.2008.04901.x

Zisberg, A., Young, H. M., Schepp, K., & Zysberg, L. (2007). A concept analysis of routine: relevance to nursing. *Journal of advanced nursing*, *57*(4), 442-453.

Appendix A: Consent Form

1. **Study Title:** Development of the Routines and Time Management Inventory for Young Adults

2. **Performance Sites:** The study has been approved by the Institutional Review Board at Louisiana State University and Agricultural and Mechanical College in Baton Rouge, Louisiana. Data will be collected through an online survey at each participant's location.

3. **Investigators:** The following researchers are available for questions about this study, M-F 8:00am - 4:30pm:

   Morgan Grinnell, M.A. (919) 589-3517, mashwi1@lsu.edu
   Jennifer Piscitello, B.A. (225) 578-5731, jpisci2@lsu.edu
   Mary Lou Kelley, Ph.D. (225) 578-4113

4. **Purpose of the Study:** The purpose of this study is to create a psychometrically sound measure of routines and time management in young adults.

5. **Subject Inclusion:** Adults aged 18-35.

6. **Number of Participants:** 300

7. **Study Procedures:** You will be asked to answer several questionnaires which are expected to require approximately 10-25 minutes to complete. Primary questionnaires will include demographic information, time management practices, and routines. Additional questionnaires will ask about quality of life, life satisfaction, and symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD).

8. **Benefits:** Development of this measure will allow researchers and clinicians to gain a better understanding of typical habits for young adults. Direct benefits to participants are course credit for participants recruited through the university's participant pool, *or* the opportunity to be entered in a drawing for $20 Amazon gift cards via a link at the completion of the survey.

9. **Risks:** The overall risk for this study is minimal. A potential risk is the inadvertent release of personal information found in the demographic questionnaire. However, your name is not directly connected to your data. Every effort will be made to maintain the confidentiality of your study records. It is possible that some participants may become uncomfortable when asked about personal information including routines, symptoms, and current distress levels.

   Should you have any concerns about whether you may have ADHD during or after the study, the following resources are recommended:

Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD)

This organization provides resources about ADHD and contact information for services in your local area. Visit www.chadd.org or call 1-800-233-4050.
Many universities and hospitals offer mental health assessment and/or treatment services. If you attend LSU or live in the Baton Rouge area, you may contact:
LSU Psychological Services Center – (225)578-1494 [Public]
LSU Mental Health Services – (225)578-8774 [LSU students]

If you have any other concerns regarding your mental health,
www.mentalhealthamerica.net is a good source for additional screenings and local services.

10. **Right to Refuse:** Participants may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

11. **Privacy:** Results of the study may be published, but no names or identifying information will be included in the publication. Collection of potentially identifying information has been kept to a minimum. Further, data will remain confidential to researchers and will be coded and securely stored. Data will be kept confidential unless release is legally compelled.

12. **Withdrawal:** You have the right to withdraw at any time without consequence.

The study has been reviewed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb.

By continuing this survey, you are giving consent to participate in the study described above.

- o I agree to participate

- o I do not wish to participate

Appendix B: Initial Items for the RTMI

Routines are events that occur regularly: at about the same time, in the same order, or in the same way every time. Routines are closely related to time management which is defined as behaviors aimed at achieving an effective use of time while performing goal-oriented activities. Time management behaviors include those related to assessing, planning, and monitoring time use.

Please rate how often you engage in each item related to routines and time management by choosing a rating ranging from 0 (Never) to 4 (Almost always) for how often you engaged in this activity based on your behavior during the last month.

	Never				Almost Always
I perform daily personal hygiene tasks (e.g., brush teeth, bathe, comb hair, wear deodorant)	0	1	2	3	4
I set an alarm to wake up in the morning	0	1	2	3	4
I charge my phone/electronics daily	0	1	2	3	4
I consistently attend work/work obligations	0	1	2	3	4
I go to bed at a time which allows an adequate amount of sleep	0	1	2	3	4
I wake up around the same time every day	0	1	2	3	4
I complete chores regularly	0	1	2	3	4
I tidy my living space daily (e.g., put my things away)	0	1	2	3	4
I put off doing laundry	0	1	2	3	4
I take medications and/or vitamins as directed	0	1	2	3	4
I schedule/attend medical appointments regularly	0	1	2	3	4
I monitor my spending and bank account(s)	0	1	2	3	4
I eat meals at the same time every day	0	1	2	3	4
I have a predictable schedule	0	1	2	3	4
I talk with my parents or family members regularly	0	1	2	3	4
I talk to friends daily (in person or via phone/internet)	0	1	2	3	4
I spend time with friends or family regularly	0	1	2	3	4
I plan and/or participate in fun weekend activities	0	1	2	3	4
I cook meals for myself	0	1	2	3	4
I attend church or participate in religious activities	0	1	2	3	4
I participate in clubs or organizations	0	1	2	3	4
I spend time daily browsing the internet or using social media	0	1	2	3	4
I watch television or stream other media daily	0	1	2	3	4
I go to bars, clubs, or parties	0	1	2	3	4
I ensure I have enough fuel in my vehicle	0	1	2	3	4
I play video games	0	1	2	3	4
I save money each month	0	1	2	3	4
I exercise regularly (e.g., 3+ times per week)	0	1	2	3	4

I drink caffeinated beverages daily	0	1	2	3	4
I volunteer my time or talents regularly	0	1	2	3	4
I monitor my caloric intake or weight	0	1	2	3	4
I drink alcohol (e.g., beer, wine, hard liquor)	0	1	2	3	4
I smoke cigarettes or use other tobacco products	0	1	2	3	4
I organize my belongings for the following day (e.g., clothes, keys)	0	1	2	3	4
I get dressed and ready in a timely manner	0	1	2	3	4
I wake up with enough time to get ready for the day	0	1	2	3	4
I begin working on long-term assignments or projects early	0	1	2	3	4
I use to-do lists or an agenda regularly	0	1	2	3	4
I schedule or complete routine vehicle maintenance	0	1	2	3	4
I respond to calls in a timely manner	0	1	2	3	4
I respond to emails in a timely manner	0	1	2	3	4
I respond to texts in a timely manner	0	1	2	3	4
I spend time planning my days or week	0	1	2	3	4
Video games, internet, or television get in the way of my productivity	0	1	2	3	4
I skip meals because I don't have time to eat	0	1	2	3	4
I plan my meals/snacks	0	1	2	3	4
I prioritize work or academics over other activities	0	1	2	3	4
I arrive on time to obligations (e.g., class, meetings, work, appointments)	0	1	2	3	4
I procrastinate on tasks I should complete	0	1	2	3	4
I depend on another adult for reminders (e.g., to make appointments or run errands)	0	1	2	3	4
I arrive on time for scheduled events with others	0	1	2	3	4
I pay bills on time	0	1	2	3	4
I need extensions on deadlines	0	1	2	3	4
I am late for meetings or appointments	0	1	2	3	4

Appendix C: Demographic Questionnaire

1. Are you currently student?
   If yes…
   a. What is your major?
   b. What is your GPA?
2. What is your current age?
3. What is your year of birth?
4. What is your sex? Male/Female/Other
5. Are you Spanish, Hispanic, or Latino or none of these? Yes/ None of these
6. Choose one or more races that you consider yourself to be:
   a. American Indian or Alaska Native
   b. Asian
   c. Black or African American
   d. Native Hawaiian/Pacific Islander
   e. White
   f. Other :_____
7. What is the highest level of school you have completed or the highest degree you have received?
   a. Less than high school degree
   b. High school graduate (high school diploma or equivalent including GED)
   c. Some college but no degree
   d. Associate degree in college (2-year)
   e. Bachelor's degree in college (4-year)
   f. Master's degree
   g. Doctoral Degree
   h. Professional Degree (JD, MD)
8. What is your current relationship/marital status?
   a. Single
   b. In relationship
   c. Living with partner
   d. Married
   e. Divorced
   f. Separated
   g. Widowed
9. Please select the housing situation that best matches your own (currently):
   a. Live at home with parents/guardians
   b. Dorm
   c. Apartment
   d. Rent home
   e. Own home
   f. Other
10. How many adults (aged 18+) **including yourself** currently live in your residence? ___

11. Which descriptions best describe the nature of your relationship with the adults you live with? *Select all that apply*
    a. Spouse
    b. Partner (e.g., boyfriend/girlfriend)
    c. Roommate(s)
    d. Parents/grandparents/older relatives
    e. Sibling(s)
    f. Live Alone
12. Do you have children? Yes/ No
    a. If Yes…How many children currently live with you? ___
13. What is your current job status?
    a. Unemployed
    b. Work part time <20 hours/week
    c. Work part-time 20 to 39 hours/week
    d. Work full time
14. What is your current income level (or household income level if married)?
    a. 0-4,999
    b. 5,000-9,999
    c. 10,000-14,999
    d. 15,000-24,999
    e. 25,000-34,999
    f. 35,000-49,999
    g. 50,000-74,999
    h. 75,000-99,999
    i. 100,000+
15. I am currently or have been previously diagnosed with or treated for:
    Please select all that apply.
    a. Adjustment Disorder
    b. Anxiety Disorder (e.g., Panic Disorder, Generalized Anxiety Disorder, Specific Phobia)
    c. Attention-Deficit/Hyperactivity Disorder / Attention Deficit Disorder
    d. Autism Spectrum Disorder
    e. Bipolar Disorder
    f. Depressive Disorder
    g. Learning Disorder
    h. Obsessive-Compulsive Disorder
    i. Post-Traumatic Stress Disorder
    j. Schizophrenia
    k. Other: _____
    l. None of the above

16. Please list the names of any medications you currently take to address psychological symptoms. If none, please write "n/a". " _____

Appendix D: Time Structure Questionnaire

(Bond & Feather, 1988)

	Yes, Always						**No, Never**
1. Do you ever have trouble organizing the things you have to do?	1	2	3	4	5	6	7
2. Do you ever find that time just seems to slip away?	1	2	3	4	5	6	7
3. Do you have a daily routine which you follow?	1	2	3	4	5	6	7
4. Do you often feel that your life is aimless, with no definite purpose?	1	2	3	4	5	6	7
5. Many of us tend to daydream about the future. Do you find this happening to you?	1	2	3	4	5	6	7
6. And what about the past? Do you find this happening to you?	1	2	3	4	5	6	7
7. Once you've started an activity do you persist at it until you've completed it?	1	2	3	4	5	6	7
8. Do you ever feel that the things you have to do during the day just don't seem to matter?	1	2	3	4	5	6	7
9. Do you plan your activities from day to day?	1	2	3	4	5	6	7
10. Do you tend to leave things to the last minute?	1	2	3	4	5	6	7
11. Do you find that during the day you are often not sure what to do next?	1	2	3	4	5	6	7
12. Do you take a long time to "get going"?	1	2	3	4	5	6	7
13. Do you tend to change rather aimlessly from one activity to another during the day?	1	2	3	4	5	6	7
14. Do you give up easily once you've started something?	1	2	3	4	5	6	7
15. Do you plan your activities so that they fall into a particular pattern during the day?	1	2	3	4	5	6	7

	Would have no idea						**Yes, definitely**
16. Can you tell how many useful hours you put in last week?	1	2	3	4	5	6	7

	Yes, always						**No, never**
17. Do you think you do enough with your time?	1	2	3	4	5	6	7
18. Do you get bored with your day-to-day activities?	1	2	3	4	5	6	7
19. Looking at a typical day in your life, do you think that most things you do have some purpose?	1	2	3	4	5	6	7

	No structure at all						**Very structured**
20. Do your main activities during the day fit together in a structured way?	1	2	3	4	5	6	7

	Change very frequently						**My interests are always the same**
21. Do the important interests/activities in your life tend to change frequently?	1	2	3	4	5	6	7

	No purpose at all						**A great deal of purpose**
22. Do your main interests/activities fulfill some purpose in your life?	1	2	3	4	5	6	7

	Yes, Always						**No, Never**
23. Do you have any difficulty in finishing activities once you've started them?	1	2	3	4	5	6	7
24. Do you spend time thinking about opportunities that you have missed?	1	2	3	4	5	6	7
25. Do you ever feel that the way you fill your time has little use or value?	1	2	3	4	5	6	7
26. Do you spend time thinking about what your future might be like?	1	2	3	4	5	6	7

Appendix E: Satisfaction with Life Scale

(Diener et al., 1985)

Below are five statements that you may agree or disagree with. Using the 1-7 scale below, indicate your agreement with each item by selecting the appropriate number. Please be open and honest in your responding.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1. In most ways my life is close to ideal.	1	2	3	4	5	6	7
2. The conditions of my life are excellent.	1	2	3	4	5	6	7
3. I am satisfied with my life.	1	2	3	4	5	6	7
4. So far, I have gotten the most important things I want in life.	1	2	3	4	5	6	7
5. If I could live my life over, I would change almost nothing.	1	2	3	4	5	6	7

Appendix F: RAND 36-Item Health Survey 1.0 Questionnaire Items

(Hays, et al., 1993)

Choose one option for each questionnaire item.

1. In general, would you say your health is:
   - 1-Excellent
   - 2-Very good
   - 3-Good
   - 4-Fair
   - 5-Poor

2. **Compared to one year ago**, how would you rate your health in general **now**?
   - 1-Much better now than one year ago
   - 2-Somewhat better now than one year ago
   - 3-About the same
   - 4-Somewhat worse now than one year ago
   - 5-Much worse now than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	1	2	3
4. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
5. Lifting or carrying groceries	1	2	3
6. Climbing several flights of stairs	1	2	3
7. Climbing one flight of stairs	1	2	3
8. Bending, kneeling, or stooping	1	2	3
9. Walking more than a mile	1	2	3
10. Walking several blocks	1	2	3
11. Walking one block	1	2	3
12. Bathing or dressing yourself	1	2	3

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	Yes	No
13. Cut down the amount of time you spent on work or other activities	1	2
14. Accomplished less than you would like	1	2
15. Were limited in the kind of work or other activities	1	2
16. Had difficulty performing the work or other activities (for example, it took extra effort)	1	2

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the amount of time you spent on work or other activities	1	2
18. Accomplished less than you would like	1	2
19. Didn't do work or other activities as carefully as usual	1	2

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- 1-Not at all
- 2-Slightly
- 3-Moderately
- 4-Quite a bit
- 5-Extremely

21. How much **bodily** pain have you had during the **past 4 weeks**?

- 1-None
- 2-Very Mild
- 3-Mild
- 4-Moderate
- 5-Severe
- 6-Very Severe

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

- 1-Not at all
- 2-A little bit
- 3-Moderately
- 4-Quite a bit
- 5-Extremely

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
23. Did you feel full of pep?	1	2	3	4	5	6
24. Have you been a very nervous person?	1	2	3	4	5	6
25. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
26. Have you felt calm and peaceful?	1	2	3	4	5	6
27. Did you have a lot of energy?	1	2	3	4	5	6
28. Have you felt downhearted and blue?	1	2	3	4	5	6
29. Did you feel worn out?	1	2	3	4	5	6
30. Have you been a happy person?	1	2	3	4	5	6
31. Did you feel tired?	1	2	3	4	5	6

32. During the **past 4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

- 1- All of the time
- 2- Most of the time
- 3- Some of the time
- 4- A little of the time
- 5- None of the time

How TRUE or FALSE is **each** of the following statements for you.

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people	1	2	3	4	5
34. I am as healthy as anybody I know	1	2	3	4	5
35. I expect my health to get worse	1	2	3	4	5
36. My health is excellent	1	2	3	4	5

Appendix G: Adult ADHD Self-Report Scale

(Kessler et al., 2005)

Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right. As you answer each question, indicate the response that best describes how you have felt and conducted yourself over the past six months.

	Never	Rarely	Sometimes	Often	Very Often
1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?	0	1	2	3	4
2. How often do you have difficulty getting things in order when you have to do a task that requires organization?	0	1	2	3	4
3. How often do you have problems remembering appointments or obligations?	0	1	2	3	4
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?	0	1	2	3	4
5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?	0	1	2	3	4
6. How often do you feel overly active and compelled to do things, like you were driven by a motor?	0	1	2	3	4
7. How often do you make careless mistakes when you have to work on a boring or difficult project?	0	1	2	3	4
8. How often do you have difficulty keeping your attention when you are doing boring or repetitive work?	0	1	2	3	4
9. How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?	0	1	2	3	4
10. How often do you misplace or have difficulty finding things at home or work?	0	1	2	3	4
11. How often are you distracted by activity or noise around you?	0	1	2	3	4
12. How often do you leave your seat in meetings or other situations in which you are expected to remain seated?	0	1	2	3	4
13. How often do you feel restless or fidgety?	0	1	2	3	4
14. How often do you have difficulty unwinding and relaxing when you have time to yourself?	0	1	2	3	4
15. How often do you find yourself talking too much when you are in social situations?	0	1	2	3	4
16. When you're in a conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish them themselves?	0	1	2	3	4
17. How often do you have difficulty waiting your turn in situations when turn taking is required?	0	1	2	3	4
18. How often do you interrupt others when they are busy?	0	1	2	3	4

Appendix H: Demographic Data for Participants Removed from Analyses

(Removed due to careless or incomplete responses)

Demographic Variables	Frequency	Percentage
N	103	
Age	*M* = 24.36(5.57)	
Missing	18	17.5
Sex		
Female	65	63.1
Male	20	19.4
Missing	18	17.5
Academic Status		
Student	53	51.5
Not Student	43	41.7
Missing	7	6.8
Hispanic/ Non-Hispanic		
Hispanic	4	3.9
Non-Hispanic	81	78.6
Missing	18	17.5
Race		
Caucasian	74	71.8
Black/Af. Amer.	4	3.9
Asian/Pac. Islander	3	2.9
Multiple Races	1	1.0
Amer. Indian/Alaskan Native	1	1.0
Other	2	1.9
Missing	18	17.5
Education Level		
Less than High School	0	0.0
High School Graduate	25	24.3
Some College, No Degree	24	23.3
Associate Degree	3	2.9
Bachelor's Degree	18	17.5
Master's Degree	8	7.8
Doctoral Degree	6	5.8
Professional Degree	1	1.0
Missing	18	17.5
Employment		
Unemployed	27	26.2
Work <20 hours/week	13	12.6
Work 20-39 hours/week	11	10.7
Work Full-Time (40+hours)	31	30.1
Missing	21	20.4
Income		

$0-$4,999	34	33.0
$5,000-$9,999	3	2.9
$10,000-$14,999	2	1.9
$15,000-$24,999	4	3.9
$25,000-$34,999	5	4.9
$35,000-$49,999	5	4.9
$50,000-$74,999	9	8.7
$75,000-$99,999	8	7.8
$100,000+	12	11.7
Missing	21	20.4
Relationship Status		
Single	34	33.0
In a relationship	23	22.3
Living with partner	7	6.8
Married	20	19.4
Separated	0	0.0
Divorced	0	0.0
Widowed	1	1.0
Missing	18	17.5
Psychological Diagnoses		
No reported diagnoses	48	46.6
ADHD	7	6.8
Adjustment Disorder	0	0.0
Anxiety Disorder	7	6.8
Autism Spectrum Disorder	0	0.0
Bipolar Disorder	0	0.0
Depressive Disorder	3	2.9
Learning Disorder	0	0.0
Schizophrenia	0	0.0
Multiple disorders	17	16.5
Other	0	0.0
Missing	21	20.4

Appendix I: Items Deleted from Initial RTMI Survey

Item Description	Deletion Rationale
I perform daily personal hygiene tasks (e.g., brush teeth, bathe, comb hair, wear deodorant)	Failed to load
I set an alarm to wake up in the morning*	Failed to load
I charge my phone/electronics daily*	Failed to load
I consistently attend work/work obligations*	Failed to load
I tidy my living space daily (e.g., put my things away)	Failed to load
I take medications and/or vitamins as directed*	Failed to load
I schedule/attend medical appointments regularly	Failed to load
I monitor my spending and bank account(s)	Failed to load
I cook meals for myself	Failed to load
I attend church or participate in religious activities*	Failed to load
I watch television or stream other media daily*	Failed to load
I go to bars, clubs, or parties*	Factor had 2 items, poor cohesion with theory
I ensure I have enough fuel in my vehicle	Failed to load
I play video games*	Failed to load
I save money each month	Failed to load
I exercise regularly (e.g., 3+ times per week)*	Failed to load
I drink caffeinated beverages daily*	Failed to load
I drink alcohol (e.g., beer, wine, hard liquor)*	Factor had 2 items, poor cohesion with theory
I smoke cigarettes or use other tobacco products	Low frequency occurrence
I organize my belongings for the following day (e.g., clothes, keys)	Failed to load
I begin working on long-term assignments or projects early	Failed to load
I use to-do lists or an agenda regularly	Failed to load
I schedule or complete routine vehicle maintenance	Failed to load
I respond to emails in a timely manner	Failed to load
I respond to texts in a timely manner	Failed to load
I skip meals because I don't have time to eat*	Failed to load
I prioritize work or academics over other activities	Failed to load
I pay bills on time	Failed to load
I need extensions on deadlines	Failed to load

Note. * indicates <.3 correlation with overall scale without item.

Appendix J: RTMI Final Version

Revised 25-Item Survey

Please rate how often you engage in each item related to routines and time management by choosing a rating ranging from 0 (Never) to 4 (Almost always) for how often you engaged in this activity based on your behavior during the last month.

	Never				Almost Always
I go to bed at a time which allows an adequate amount of sleep	0	1	2	3	4
I wake up around the same time every day	0	1	2	3	4
I complete chores regularly	0	1	2	3	4
I put off doing laundry*	0	1	2	3	4
I eat meals at the same time every day	0	1	2	3	4
I have a predictable schedule	0	1	2	3	4
I talk with my parents or family members regularly	0	1	2	3	4
I talk to friends daily (in person or via phone/internet)	0	1	2	3	4
I spend time with friends or family regularly	0	1	2	3	4
I plan and/or participate in fun weekend activities	0	1	2	3	4
I participate in clubs or organizations	0	1	2	3	4
I spend time daily browsing the internet or using social media*	0	1	2	3	4
I volunteer my time or talents regularly	0	1	2	3	4
I monitor my caloric intake or weight	0	1	2	3	4
I get dressed and ready in a timely manner	0	1	2	3	4
I wake up with enough time to get ready for the day	0	1	2	3	4
I respond to calls in a timely manner	0	1	2	3	4
I spend time planning my days or week	0	1	2	3	4
Video games, internet, or television get in the way of my productivity*	0	1	2	3	4
I plan my meals/snacks	0	1	2	3	4
I arrive on time to obligations (e.g., class, meetings, work, appointments)	0	1	2	3	4
I procrastinate on tasks I should complete*	0	1	2	3	4
I depend on another adult for reminders (e.g., to make appointments or run errands)*	0	1	2	3	4
I arrive on time for scheduled events with others	0	1	2	3	4
I am late for meetings or appointments*	0	1	2	3	4

Note. * indicates items to be reverse-scored.

Appendix K: IRB Approval Forms

ACTION ON PROTOCOL APPROVAL REQUEST

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu
lsu.edu/research

TO: Mary Lou Kelley
Psychology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: October 20, 2017

RE: **IRB#** 3949

TITLE: Development of the Routines and Time Management Inventory for Young Adults

New Protocol/Modification/Continuation: New Protocol

Review type: Full ____ Expedited _X_ **Review date:** 10/19/2017

Risk Factor: Minimal ___X___ Uncertain _____ Greater Than Minimal_____

Approved_____X_____ **Disapproved**_____

Approval Date: 10/19/2017 **Approval Expiration Date:** 10/18/2018

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 300

LSU Proposal Number (if applicable):

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Dennis Landin, Chairman _____

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc.**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.lsu.edu/irb*

ACTION ON PROTOCOL APPROVAL REQUEST

Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu
lsu.edu/research

TO: Mary Lou Kelley
Psychology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: November 17, 2017

RE: **IRB#** 3949

TITLE: Development of the Routines and Time Management Inventory for Young Adults

New Protocol/Modification/Continuation: Modification

Brief Modification Description: Increase participants to 550.

Review type: Full ___ Expedited __X__ **Review date:** 11/17/2017

Risk Factor: Minimal ____X____ Uncertain _____ Greater Than Minimal_____

Approved___X____ **Disapproved** _____

Approval Date: 11/17/2017 **Approval Expiration Date:** 10/18/2018

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 550

LSU Proposal Number (if applicable):

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Dennis Landin, Chairman _____

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study. 7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: Make sure you use bcc when emailing more than one recipient.**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.lsu.edu/irb*

Vita

Morgan Grinnell was born in Hammond, Louisiana and raised in Waxhaw, North Carolina by her parents David and Darlene Ashwill. She attended the University of North Carolina at Chapel Hill and graduated with honors in 2011 with a Bachelor of Arts degree in Psychology and Sociology. After graduation, she began her graduate career at Louisiana State University under the supervision of Dr. Mary Lou Kelley. Morgan received her Master of Arts degree in May 2014 and began working towards her doctorate in Clinical Psychology. She completed her predoctoral internship through the Johns Hopkins School of Medicine at the Kennedy Krieger Institute. She anticipates receiving her Ph.D. in Clinical Psychology in May 2018. Her area of specialization is clinical child and adolescent psychology, with a research focus on ADHD.