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Acknowledgements

As we, the editors, think about the present issue of the New School Psychology Bulletin, we come to realize that we are looking at once in two directions. We look back to thank all those who made this publication possible, and we look forward to embracing the success of our authors and capturing the curiosity of our readers. There are many people to thank. Student run publications are just as much an instrument of professional growth as they are a platform for communication. Howard Steele, our brilliant faculty advisor, inspired us to optimize the teaching value of the NSPB experience. Our enthusiastic editorial board proficiently reviewed and critiqued every manuscript submission. They are the backbone of our journal. Their extraordinary generosity determined this year's journal success. They delivered intelligent feedback, enabling us to craft a journal of extraordinary caliber. Janiera Warren held us together. Her kindness, professional demeanor and organizational skill kept things running smoothly. Jessica Engelbrecht graciously lent us her knowledge and editing expertise. At times we really needed her skill and reassurance. Clinton Merck was always available to answer questions and offer advice. Looking forward, we applaud our authors for their scholarship and their commitment to research authenticity. We wish them continued success. We admire the cover illustration and page layout done by the talented Alyson Aladro. Her graphics stylistically frame the authors' work and tell the reader that our journal is something essential on which a larger entity is based. We consider our readers and realize that we are driven by their interests. We commend the Psychology Department of the New School for Social Research for providing financial support and for encouraging students to learn the ins and outs of academic publishing. It is with heartfelt appreciation that we say thank you.

Letter from the Editors

Spring 2019

Dear Readers,

We are proud to present this year's issue of the New School Psychology Bulletin (NSPB), commemorating our 16th year of publication. The quality of this volume would not be possible without the commitment and rigor of the authors, editorial staff, and layout editor, and we would like to recognize the significance of their efforts.

The NSPB continues to maintain its mission to promote research and scientific writing within university psychology departments and to offer training and experiential education in academic publishing to graduate students. We believe in the importance of providing students with this opportunity to become contributors to the field and to engage in scientific inquiry, particularly in an age where truth and a standard for evidence can be more difficult to come by.

The articles selected for this issue are indicative of the wide variety of manuscripts received throughout the year. Each aims to extend the reach of psychological research whether it is through the consideration of new standards in clinical assessment and care, in evaluation of relationships between human disposition and behavior, or in assessing the effects of age on self-defining memory.

With that, we welcome you again to our 16th volume of the NSPB. We hope that you enjoy the following articles. They represent the culmination of a year of hard work and thoughtful scholarly exploration.

Sincerely,
Gregory Weil
Lorraine Afflitto
Emily Weiss

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Posttraumatic Stress Disorder in Children 6 and Under: A Comprehensive Review of the New Diagnosis

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Research has shown that a significant number of young children will experience a traumatic event at some point during their lifetime. These experiences have also been shown to lead to negative reactions and adverse outcomes if not properly addressed and treated. Sometimes individuals who experience these traumatic events develop posttraumatic stress disorder (PTSD); however, concern about the under-diagnosis of PTSD in young children has only recently led to the creation of a subtype specifically for children ages 6 and under. This paper reviews and critically evaluates the *Diagnostic and Statistical Manual of Mental Disorders'* (5th ed.; DSM-5; APA, 2013) novel PTSD subtype and empirical research supporting this new addition. Additionally, this paper summarizes empirical findings regarding the presentation of PTSD in young children and highlights areas for future research.

Keywords: childhood trauma, *DSM-5*, posttraumatic stress disorder

Posttraumatic stress disorder (PTSD) is a mental health condition that can develop following a traumatic event (American Psychiatric Association [APA], 2013). Traumatic events are broadly defined as exposure to real or imagined harm or death and may include, but are not limited to, physical or sexual assault, exposure to war or combat, severe car accidents, and natural disasters (APA, 2013). PTSD is characterized by repeated re-experiencing of the traumatic event, which manifests in a combination of recurrent intrusive cognitions, mood and sleep disturbances, and hyperarousal (APA, 2013; Blank, 2007). Though informal labels like "shell shock" and "battle fatigue" gained notoriety in the United States nearly a century ago, following World War I, PTSD was not recognized as a psychiatric disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) until its third edition in 1980 (DSM-III; APA, 1980). Since then, the diagnostic criteria for PTSD have been adapted in subsequent iterations of the DSM to reflect empirical findings regarding normative and maladaptive responses to trauma. This research has also contributed to the formulation of a wide variety of effective therapeutic interventions for individuals who experience significant psychological difficulties following both discreet and complex traumas (Foa, Hembree, & Rothbaum, 2007).

While preparing the fifth edition of the DSM (DSM-5; APA, 2013), the Anxiety and Dissociative Disorders Work Group made several notable changes to the PTSD diagnosis. Chief among them was the inclusion of a novel developmental subtype of the disorder specifically for children 6 years of age and younger (PTSD-6U). Census data indicate that there were over 23 million children under the age of 6 living in the United States in 2017 (U.S. Census Bureau, 2017). Furthermore, over 25% of children have been shown to witness or experience a traumatic event before the age of 4 (National Center for Mental Health Promotion and Youth Violence Prevention, 2012). Therefore, children under 6 represent a substantial percentage of the current population, and a significant subsample of these children have experienced trauma and are therefore at-risk for developing posttraumatic stress symptoms. While there have been few studies on the prevalence of PTSD in children aged 6 years and under, research suggests PTSD symptoms are both prevalent and persistent among younger children who are exposed to trauma (e.g., Scheeringa, Zeanah, Myers, & Putnam, 2003). Therefore, the PTSD-6U subtype is noteworthy because it is the first developmental subtype of an existing disorder and its inclusion reflects increasing evidence suggesting trauma-response symptoms manifest differently in children as a function of developmental maturity (Scheeringa, Zeanah, & Cohen, 2011).

The current paper begins with a review of the empirical research on the etiology and presentation of trauma-response symptoms in children aged 6 years and under. Next, the paper details the development of the PTSD-6U subtype, highlighting major changes and controversies in the professional literature. Finally, the authors explore the implications of the PTSD-6U subtype for the assessment and treatment of PTSD in young children and introduce areas for further inquiry. Overall, this paper seeks to demonstrate the importance and necessity of the incorporation of developmentally appropriate subtypes for PTSD in the DSM, but also to caution researchers and clinicians against overreliance on this classification system until more research on its utility and accuracy is available.

Etiological Models of PTSD-6U

Before discussing the diagnostic criteria for PTSD-6U in detail, the prevalence of childhood traumatic experiences and etiological models related to the development of PTSD warrant discussion. Research indicates that over 50% of community samples have experienced at least one adverse childhood experience (ACE), defined as a stressful or traumatic event occurring during childhood, such as abuse or neglect (Monnat & Chandler, 2015). This research also suggests that up to 40% of community samples experience two or more ACEs and that experiencing multiple ACEs can lead to greater physical and mental health problems in adulthood (e.g., Felitti et al., 1998; Monnat & Chandler, 2015). It is important to note that, although traumatic experiences are relatively common, not all trauma survivors go on to develop PTSD (e.g., Schore, 2002). Therefore, to inform more accurate assessment and prevention procedures for PTSD, it is imperative to understand how trauma exposure leads to the development of posttraumatic symptoms and why some people, but not others, develop these symptoms. Furthermore, in considering how PTSD develops in children, it is important to consider how posttraumatic symptoms may develop differently in children versus adults.

Several etiological models provide theoretical and empirically supported hypotheses for how PTSD develops following traumatic events that occur during childhood. Primarily, these models highlight risk factors that increase one's likelihood of developing PTSD following exposure to an ACE. For example, Terr (1991) argues that posttraumatic reactions are affected by two types of traumatic conditions: Type I and Type II. Type I disorders are characterized as "single-blow" events and are more common (e.g., car accident, dog bite). According to previous DSM criteria, Type I experiences are thought to be more commonly associated with fully-detailed memories, cognitive reappraisals, and misperceptions, making these traumas more likely to lead to PTSD (Terr, 1991). Type II disorders, sometimes referred to as complex trauma (Courtois & Ford, 2009), are characterized by long-standing, repeated exposures to traumas (e.g., continued sexual abuse). These experiences are thought to be more commonly associated with psychic numbing, dissociation, and a sense of rage (Terr, 1991). Additionally, when a Type I trauma creates a long-standing series of adversity (e.g., an accident that results in permanent scarring), it is deemed a "crossover trauma". Whereas different types of trauma may be related to different manifestations of posttraumatic stress, Terr (1991) argues that all three types may lead to adverse experiences later in life for these children. Therefore, Terr's (1991) model suggests that while many types of childhood traumatic experiences impact children's long-term functioning, certain types of traumatic experiences may be more highly related to the development of PTSD (i.e., Type I traumas).

Another empirically supported risk factor for the development of PTSD is children's attachment to their parent or parents. For example, Schore (2002) argues that children with disorganized attachment are the most at risk for developing PTSD. This type of attachment is common among children who were abused during the first 2 years of life, particularly if such abuse occurred at the hands of a caregiver (Schore, 2002). These children then tend to develop communication difficulties, are unable to interpret the emotions of others, and have more difficulty recovering from emotional distress (Blank, 2007; Schore, 2002). Attachment has been acknowledged as a key factor in normative childhood development as early as the DSM-III (APA, 1980) through the inclusion of diagnoses such as reactive attachment disorder (RAD). More specifically, RAD presents initially during infancy and early childhood and is characterized by marked difficulties in social interactions across contexts, often due to a history of severe abuse and/or neglect and a subsequent inability to develop secure attachments with caregivers (APA, 2013). With growing research on RAD and other attachment-related disorders, research has continued to investigate the role that attachment plays in the risk of developing PTSD following traumatic experiences (e.g., Karatzias et al., 2018; Schierholz, Krüger, Barenbrügge, & Ehring, 2016).

Other etiological models originally intended to explain the development of posttraumatic symptoms in adults have been adapted to describe PTSD in young children. For example, the PTSD Etiological Hypothesis developed by Foy, Madvig, Pynoos, and Camilleri (1996) suggests that the development of PTSD is contingent upon the presence of mediating variables and the lack of protective variables. According to Foy et al. (1996), the mediating variables may be divided into three categories: 1) those that are directly linked to the traumatic event, 2) those independent of the traumatic event, and 3) potentiating factors that heighten the posttraumatic reaction.

In keeping with these categories of risk, the mediating variables directly associated with the traumatic event may include the severity of the trauma, perceived life threat, personal injury, and interpersonal violence, especially if perpetrated by or against a caregiver (Scheeringa, Wright, Hunt, & Zeanah, 2006). Independent risk factors may include environmental conditions, such as low socioeconomic status, prior trauma exposure, lower education, and family psychiatric history. These have been identified as pre-trauma risk factors for the development of PTSD symptoms (APA, 2013; Pine & Cohen, 2002). In addition, several post-trauma risk factors may also potentiate the risk for developing PTSD, including children's use of negative appraisals and inappropriate coping strategies (APA, 2013). Likewise, subsequent exposure to repeated upsetting reminders, adverse life events, and other trauma-related losses may also increase the risk of developing PTSD (Breslau, 2009; Vogt, King, & King, 2014). Finally, disruptions in family functioning and social support networks that often result from trauma have been shown to significantly increase the risk for developing PTSD symptoms in young children (Pine & Cohen, 2002). Therefore, children exposed to the aforementioned risk factors are more likely to experience PTSD symptoms that may impact their daily functioning, such as distressing and intrusive thoughts of the traumatic event(s), avoidance of stimuli that remind them of the event(s), and/or sleep disturbance due to nightmares.

The PTSD-6U Developmental Process: Critiques of the Previous DSM Criteria

The research cited above highlights several risk factors for PTSD that are unique to children (e.g., trauma perpetrated by a caregiver), suggesting that there may be differences in the etiology and development of PTSD in young children versus adults. Research on risk factors for the development PTSD in young children, in combination with research highlighting the developmental insensitivity of the prior DSM criteria, has laid the foundation for a more accurate and developmentally appropriate set of diagnostic criteria for PTSD in children ages 6 and under. This section reviews the developmental process of the PTSD-6U subtype and presents controversies and critiques surrounding prior DSM iterations that inspired the final DSM-5 criteria.

The PTSD-6U subtype was developed and introduced in the DSM-5 in response to several concerns regarding the lack of developmental sensitivity and behavioral anchoring of the DSM-IV-TR's PTSD criteria. In fact, many scholars have argued that the DSM-IV-TR diagnostic guidelines led clinicians to misclassify or overlook many cases of PTSD in young children due to the criteria's developmental insensitivity (Scheeringa, Zeanah, et al., 2011). This criticism is perhaps not surprising given that the DSM-IV-TR's PTSD criteria were developed from and field-tested exclusively on individuals ages 15 years and older. Whereas some age-related notes were included to allow for diagnosing children younger than 15, little research had been previously conducted on the symptomatology of this age group (Scheeringa, Zeanah, et al., 2011). However, since the publication of the DSM-IV-TR, there has been a substantial increase in research exploring differences in symptom presentation in young children and the validity of the PTSD-6U subtype (Scheeringa, Zeanah, Peebles, & Cook, 2001; Scheeringa et al., 2006).

Some of this research has supported the need for symptom assessment to be "behaviorally anchored," meaning that the required symptoms are salient, easily observed by clinicians, and not based on the child's subjective experience (Scheeringa, Zeanah, Drell, & Larrieu, 1995; Scheeringa et al., 2001). Therefore, to address shortcomings of previous PTSD diagnostic criteria, Scheeringa and colleagues (2003) proposed an alternative set of diagnostic criteria that were less dependent on patient- and parent-reports and more reliant on clinician observations. As part of the Scheeringa et al. (2003) study, 62 traumatized children under 7 years-old were compared with a control group of 63 children in the same age range using the DSM-IV-TR PTSD criteria and the proposed alternative criteria. Findings revealed that 68% of the traumatized children exhibited symptoms of re-experiencing (Cluster B), 39% exhibited at least one symptom of avoidance or numbing (Cluster C), and 73% exhibited alterations in arousal (Cluster D; Scheeringa et al., 2003). Despite elevated rates of symptom endorsement in each cluster, the DSM-IV-TR criteria diagnosed none of the children with PTSD. On the other hand, the proposed alternative algorithm, which provided the basis for the DSM-5 PTSD-6U subtype, diagnosed 26% of the children. This finding was the first research support for a prevalence rate in children consistent with PTSD prevalence rates in adult samples (Scheeringa et al., 2003). This study also demonstrated that children meeting criteria for PTSD using the alternative algorithm exhibited more comorbid mental health problems compared to the traumatized children who did not meet criteria for PTSD and the healthy controls (Scheeringa et al., 2003).

Critics of the DSM-IV-TR's diagnostic criteria for PTSD also argued that the high thresholds required to meet criteria for the disorder prevented symptomatic children from receiving diagnoses and treatment for a disorder. Scheeringa, Myers, Putnam, and Zeanah (2012), for example, found that 44% of a sample of traumatized preschool-aged children met criteria for PTSD based on the DSM-5 PTSD-6U subtype criteria, while only 13% met criteria based on DSM-IV-TR criteria. Therefore, approximately 31% of children who were characterized as highly symptomatic and impaired would not have been diagnosed using the DSM-IV-TR system (Scheeringa et al., 2012). These results indicate that lowering the threshold of symptoms needed to meet criteria more accurately captures clinically significant cases and does not lead to the over-diagnosis of mildly symptomatic cases as some critics have suggested (Scheeringa et al., 2012).

As demonstrated by the above-cited research, the DSM-IV-TR's requirement of several symptoms within each cluster made it difficult for children experiencing challenges associated with trauma response symptoms to qualify for a diagnosis of PTSD. This prevented many young children who were experiencing clinical distress from receiving a diagnosis. Further, the research suggested that the DSM-IV-TR criteria contained items that may not have supported an empirical diagnosis of PTSD among very young children (Scheeringa et al., 2003; Scheeringa et al., 2012). These findings were the impetus for the formation of the PTSD-6U subtype, which has lower symptom thresholds and relies more heavily on observable behavioral indicators relative to the adult PTSD diagnosis. The following section reviews the revisions and additions for each symptom cluster in greater detail, as well as highlights the research support for these changes.

DSM-5 Diagnostic Criteria: Empirical Support for Revisions and Additions

Accurate assessment and treatment of PTSD-6U requires close consideration of the development of posttraumatic symptoms in young children following exposure to traumatic events. As mentioned previously, the diagnostic criteria for this subtype are intended to be behaviorally anchored due to challenges associated with young children's developing abstract cognitive and verbal expression capabilities (Scheeringa et al., 2012). In this section, each cluster of the DSM-5 PTSD-6U subtype and its associated symptoms are presented along with research that supports many of these changes as empirically-based improvements to the previous diagnostic criteria. For quick reference, a comprehensive summary of the differences between DSM-IV-TR and DSM-5 PTSD criteria is presented in Table 1. It is also important to note that the following symptoms must be present for over one month and must cause significant distress or impairment to meet criteria for PTSD (APA, 2013).

Cluster A: Exposure to Trauma

According to the DSM-5, a diagnosis of PTSD in children who are ages 6 years or younger requires meeting Cluster A, or "…exposure to actual or threatened death, serious injury, or sexual violence..." (APA, 2013, p. 272). This exposure may be directly experienced, witnessed, or learned about if the event occurred to a parent or caregiving figure (APA, 2013). As a note, the criteria stipulate that witnessing a traumatic event must occur in person and does not include events children may witness through movies, television, or other forms of electronic media.

In developing the DSM-5 criteria for PTSD and the PTSD-6U subtype, some pushed to remove any requirement for children to have experienced a trauma, given concerns about the subjective nature of determining what events are considered "traumatic" (Brewin, Lanius, Novac, Schnyder, & Galea, 2009). Ultimately, Cluster A was included for both the general PTSD diagnosis and the PTSD-6U subtype given that the experience and memory of trauma is core to the diagnosis and essential to understanding the other symptoms required for PTSD (Friedman, 2013). Another criticism of the DSM-IV-TR's PTSD criteria was whether indirect exposure (i.e., hearing about the death or serious injury of a loved one) constituted as a "trauma." Research has indicated that a significant number of individuals develop PTSD after learning about the traumatic death of a loved one (Breslau & Kessler, 2001). As such, indirect exposure remained in Cluster A but was made more stringent to address the concerns cited above. Specifically, for the DSM-5 general PTSD diagnosis, in order for learning about the death of a loved one to be considered a "trauma," the death is required to be violent or accidental. However, for children 6 and under, any learned traumatic events occurring to caregivers may constitute as trauma, even if not violent or accidental (APA, 2013).

In order to meet criteria for a traumatic event in the DSM-IV-TR, individuals were also required to have experienced an emotional reaction to the trauma (i.e. fear, helplessness, horror). However, a note was included that children could also present with "disorganized or agitated behavior" (APA, 2000, p. 467). The DSM-IV-TR did not provide examples of behaviors that may be characterized as disorganized or agitated. Moreover, research on the PTSD-6U subtype has not been able to provide concrete, observable examples of reactions that would fit this criterion. Therefore, critics of the DSM-IV-TR criteria highlighted the vagueness of and difficulty in defining "disorganized and agitated behavior" (APA, 2000, p. 467). Critics also suggested that there was insufficient evidence to replace fear, helplessness, and horror with "disorganized and agitated behavior" when diagnosing PTSD in children (Scheeringa et al., 1995; Scheeringa, Zeanah et al., 2011). Furthermore, this criterion posed a unique problem for children given the difficulty of determining a child's emotional state at the time of a traumatic event without an adult witness present. A review of the literature found that when requiring this criterion, 7.9% of children would not have met criteria for PTSD (Scheeringa, Zeanah, et al., 2011). The DSM-5's overall PTSD diagnosis no longer includes the need for an emotional reaction at the time of the trauma. This removal may, in part, be a result of research suggesting that children (and perhaps older individuals) express a diverse range of emotions (e.g., sadness, anger, confusion, and surprise) during and following traumatic experiences. Critics argue that this range was not accurately captured in the previous criteria (Scheeringa, Zeanah, et al., 2011).

Cluster B: Intrusion Symptoms

Cluster B symptoms were referred to as "re-experiencing" symptoms in previous iterations of the DSM, though the wording was changed to "intrusion" symptoms because it is often difficult to explicitly link the content of the symptoms to the traumatic event in young children (APA, 2013). According to the DSM-5, within Cluster B, children ages 6 and younger must experience at least one

Table 1

Differences between DSM-IV-TR PTSD, DSM-5 *Adult PTSD, and the* DSM-5 *PTSD-6U Subtype Criteria*

Criteria	**DSM-IV-TR**	**DSM-5 Adult PTSD**	**DSM-5 PTSD-6U Subtype**
Trauma	I. Extreme reaction at the time of the event required II. Learning about death of a loved one *not* required to be accidental or violent	I. Extreme reaction *not* required II. Learning about death of a loved one required to be accidental or violent	I. Extreme reaction *not* required II. Learning about traumatic events required to occur to parent or caregiver (*not* required to be accidental or violent)
Intrusion symptoms	Intrusive recollections required to be distressing	Intrusive recollections required to be distressing	Intrusive recollections *not* required to be distressing
Avoidance and negative cognitions symptoms	I. Avoidance and negative cognitions clusters combined II. 3 symptoms required III. Inability to remember aspects, sense of foreshortened future IV. Detachment from others	I. Avoidance and negative cognitions clusters separate II. 1 avoidance and 2 negative cognitions symptoms required III. Inability to remember aspects, persistent negative beliefs about self, persistent cognitive distortions about event IV. Detachment from others	I. Avoidance and negative cognitions clusters combined II. 1 symptom required III. Inability to remember *not* required IV. Socially withdrawn behavior
Increased arousal symptoms	Reckless or self-destructive behavior *not* included	Reckless or self-destructive behavior included	Reckless or self-destructive behavior *not* included

intrusion symptom to meet criteria for PTSD. These may include “intrusive distressing memories”, “distressing dreams”, or “dissociative reactions (e.g., flashbacks)” (APA, 2013, p. 273). It is also noted that “spontaneous and intrusive memories may not necessarily appear distressing and may be expressed as play reenactment” (APA, 2013, p. 273). Furthermore, the criteria emphasize that it may not always be possible to determine if the frightening content in a dream is related to the traumatic event and that some dissociative reactions may only occur through play (APA, 2013). Intrusive symptoms may also include psychological distress or physiological reactions (e.g., rapid heartbeat) to reminders of the trauma (e.g., someone who resembles the perpetrator of experienced abuse; APA, 2013).

Whereas some of the wording pertaining to intrusion symptoms has been changed from the DSM-IV-TR to the DSM-5, the five symptoms have essentially remained the same in the adult diagnosis. However, despite the relatively unchanged criteria for PTSD in adults, there have been some important alterations to the way PTSD symptoms are conceptualized in children 6 and under. The main differences in Cluster B criteria for adults and children 6 and under center around the unique ways in which children may react to thoughts and memories of the traumatic event.

One such example is evidenced by the removal of the requirement that intrusive memories be distressing. Research has shown that children exhibit a variety of emotional responses during intrusive thoughts, ranging from true distress to “overbright” and positive responses (Scheeringa et al., 1995, 2001). Additionally, no difference in number of symptoms endorsed has been found between children who do and do not experience distress during re-experiencing (Scheeringa, Zeanah, et al., 2011). Based on this research, a note was included in the DSM-5 criteria indicating that children do not always express distress during intrusion or re-experiencing symptoms (APA, 2013, p. 273).

Research has also shown that re-experiencing in children may manifest during play and may focus on imagined rescues rather than the events that actually occurred (APA, 2013). For example, in young children, re-experiencing sometimes takes the form of wishful thoughts of intervention and children may enact rescue or intervention plans in response to reminders rather than experiencing typical “flashbacks” of the event itself (Pynoos et al., 2009). For this reason, an additional note was added to the dissociative reactions criteria to suggest that trauma-related reenactment may occur during play.

Cluster C: Avoidance of Stimuli or Negative Alterations in Cognitions

In order to meet criteria for Cluster C of the PTSD diagnosis, children 6 and under must experience one or more symptoms associated with either “… avoidance of stimuli associated with the traumatic event(s) or negative alterations in cognitions and mood…” (APA, 2013, p. 273). Avoidance symptoms include efforts to avoid physical reminders (i.e., activities, places) or interpersonal situations (i.e., people, conversations) that stir memories of the traumatic event. Negative alterations in cognitions include more frequent negative emotional states, reduced interest in activities (e.g., restriction of play), social withdrawal, and reduced positive emotions (APA, 2013).

Regarding avoidance symptoms, the DSM-5 notes that avoidance in children may be expressed through restricted play or restricted exploratory behavior (APA, 2013). This may be explained by a desire to remain close in proximity to the caregiver for their own protection and to ensure the safety of the caregiver (Pynoos et al., 2009). The avoidant behavior may also manifest in extreme response to age-specific fears (e.g., fear of the dark) that may or may not be related to the traumatic event (Pynoos et al., 2009).

Overall, Cluster C symptoms have been the most largely criticized criteria of previous DSM criteria. This is likely due to Cluster C being largely composed of internalizing symptoms, these internalized behaviors have been found to be the least prevalent and most difficult symptoms to detect among children (Scheeringa et al., 2003, 2012). As a result, research has demonstrated that the requirement for an individual to display at least three Cluster C symptoms prevented many young children from receiving a PTSD diagnosis, even when they would have otherwise met criteria (Scheeringa, Zeanah, et al., 2011). Furthermore, several of the DSM-IV-TR symptoms were considered “developmentally impractical” in that they are difficult to detect in children, even when present (Scheeringa, Zeanah, et al., 2011, p. 773). Elimination of symptoms and reduction in the number of required symptoms was therefore undertaken to address this developmental impracticality. For example, children are now only required to meet one or more avoidance or negative cognition symptom for the DSM-5 PTSD-6U subtype (APA, 2013).

The most significant changes to Cluster C involve the “negative alterations in cognition” symptoms, which were previously termed “numbing” items in DSM-IV-TR. As opposed to adults, in the DSM-5 children are not required to demonstrate an inability to remember key components of the event, persistent negative beliefs about oneself or the world, or distorted thoughts about the cause or consequences of the trauma (APA, 2013). These symptoms are internal, and their detection is largely reliant on a person’s self-report of their subjective experiences. Because young children are often limited in their expression of emotions or thoughts, negative alterations in cognition tend to be primarily shown through mood changes (APA 2013; Scheeringa, Zeanah, et al., 2011). As such, DSM-5’s diagnosis now includes “increased frequency of negative emotional states” (APA, 2013, p. 273) as a symptom. Examples of negative emotional states can include sadness, guilt, shame, and fear (APA, 2013). While this change may help caregivers and clinicians detect and document changes in a child’s cognitions more reliably, some critics argue this criterion is unhelpful because it is poorly operationalized and unsupported by empirical data (Scheeringa, Zeanah, et al., 2011). As a result, socially withdrawn behavior replaced the need for feelings of detachment as a symptom to provide observable behavior for parents (Fivush, 1998; Scheeringa, Zeanah, et al., 2011).

Cluster D: Alterations in Arousal and Reactivity

To meet Cluster D criteria, children 6 and under must present with at least two of the following “alterations in arousal and reactivity…” (APA, 2013, p. 273): “irritable behavior and angry outbursts…”, heightened sensitivity to potential threats (i.e., hypervigilance), an “exaggerated startle response” (e.g., reactive to unexpected stimuli, jumpiness to loud noises), “problems with concentration”, or “sleep disturbance” (which may be associated with nightmares; APA, 2013, p. 273).

Similar to Cluster B, most of the increased arousal symptoms for Cluster D were not changed for the DSM-5. The DSM-5 notes that children may exhibit irritability and anger through temper tantrums, given that this is a common expression of these emotions in younger children; however, these tantrums must be a departure from what was exhibited by the child prior to the traumatic event (Scheeringa, Zeanah, et al., 2011). Additionally, research has shown that hypervigilance may manifest as separation anxiety in children (Pynoos et al., 2009). These children are hypervigilant about the safety of caregivers, constantly seek reassurance, and are always looking for ways to escape or confront danger (Pynoos et al., 2009).

Clinical Implications and Future Directions

Assessment and Treatment of the PTSD-6U Subtype

While the PTSD-6U subtype is a relatively new diagnosis, several screening and assessment materials have been developed and are empirically supported for this age group. The most commonly used assessment instrument for identifying trauma exposure and PTSD symptoms is the UCLA PTSD Reaction Index (Steinberg, Brymer, Decker, & Pynoos, 2004). Both child- and parent-report versions are available, including a 6-item parent screening version of the UCLA PTSD Reaction Index recommended for children under the age of 8 (Cohen, Berliner, & Mannarino, 2010). Parents report the frequency with which their child has displayed each symptom in the previous month on a 0-2 scale (*Hardly at all, Sometimes, A lot*). Two items assess intrusive symptoms (intrusive memories, upsetting thoughts), one item assesses avoidance symptoms, two items assess negative alterations in arousal (feelings of anger/irritability, aggressive behaviors following the trauma), and one item assesses sleep disturbances (scale available in Cohen, Kelleher, & Mannarino, 2008). Due to its short length, this screener can be administered quickly and at multiple time points during treatment as a means of measuring treatment outcomes.

Additional parent-report measures are also available. The Pediatric Emotional Distress Scale (PEDS), for example, is a 21-item parent-report measure that examines elevations in psychopathology among children ages 2 to 10 years-old who have been exposed to traumatic events (Saylor, Swenson, Reynolds, & Taylor, 1999). More recently, Kramer and colleagues (2013) adapted the PEDS to more directly assess reactionary changes following recent trauma exposure (as opposed to preexisting conduct problems). This adaptation, called the PEDS Early Screener (PEDS-ES), is supported as an effective early screening tool to identify children between 2 and 6 years-old who meet full or partial PTSD criteria (Kramer, Hertli, & Landolt, 2013). Other measures, such as the Child Behavior Checklist (Dehon & Scheeringa, 2006) and the Young Child PTSD Checklist (Scheeringa, 2010), have been used to assess symptoms of posttraumatic stress in younger children but were developed prior to the publication of the PTSD-6U subtype.

With regard to treatment for PTSD-6U, Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) is one of the most established and commonly used empirically supported treatments (Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011). TF-CBT is a conjoint child and parent therapy that focuses on exposure to the traumatic event, learning anxiety management techniques, and correcting cognitive distortions surrounding the traumatic event (Mannarino, Cohen, Deblinger, Runyon, & Steer, 2012). This treatment was designed for use with children aged 3 through 17 years, with adaptations for children of different developmental levels (Cohen et al., 2008). This treatment has also been adapted to address various types of abuse and trauma and uses a cognitive-behavioral framework to increase education about trauma, develop emotion regulation and coping skills, and create a sense of safety and security for the child (Ramirez de Arellano et al., 2014).

Treatment success in TF-CBT requires at least a basic understanding of common emotions, as this understanding forms a point of reference by which clinicians help children reprocess their traumatic experience (Cohen et al., 2010). Scheeringa, Weems, Cohen, Amaya-Jackson, and Guthrie (2011) describe methods of adapting the protocol for younger children in order to account for differences in intellectual and affective development. For example, the researchers suggest adapting the first session's psychoeducation component to teach children about basic emotions by labeling them and putting them in story form (Scheeringa, Weems, et al., 2011). The manual also includes pictures that illustrate each PTSD symptom to assist clinicians in educating younger children about the nature of these difficulties and to help them identify their unique symptom presentation.

More recently, Salloum, Scheeringa, Cohen, and Storch (2014) proposed a stepped-care model (Stepped Care TF-CBT) for conducting TF-CBT with young children. Stepped care delivery models are designed to limit direct therapist involvement initially and to increase involvement if deemed necessary as treatment progresses (Salloum et al., 2014). In Step One of Stepped Care TF-CBT, the therapist and parent meet for three sessions to discuss the rationale for TF-CBT and how to deliver the treatment protocol. Parents are also provided with a workbook containing supplemental activities to complete with their child. During Step One, clinicians provide support via weekly telephone consultation and address specific concerns. For children whose symptoms persist after they have completed the TF-CBT protocol with a parent, Salloum and colleagues (2014) recommend implementing a more intensive second step in which the therapist meets with the parent and child for standard, therapist-directed TF-CBT. The authors note that, while Stepped Care TF-CBT shows promise as a means to deliver treatment in an efficient and cost-effective manner, additional research is necessary to further refine the content and structure of the services delivered at each step (Salloum et al., 2014).

Though TF-CBT is currently the most empirically-supported treatment for PTSD in children (e.g., Deblinger et al., 2011; Scheeringa, Weems, et al., 2011), other evidence-based treatments have been developed and have proven efficacious for this population. These additional evidence-based treatments include child-parent psychotherapy and parent-child interaction therapy (Schneider, Grilli, & Schneider, 2013).

Whereas most evidence-based interventions for young children with PTSD involve substantial non-offending parent involvement, it is important to consider interventions for children whose parents may be the perpetrators of their abuse. Although not assessed with children 6 and under, research indicates that when the child component of TF-CBT is delivered alone (i.e., without the parent or conjoint child and parent components), children between ages 7 and 13 show greater reductions in PTSD symptoms compared to children who are referred to therapists in their own communities for treatment (Deblinger, Lippmann, & Steer, 1996). Furthermore, several interventions, such as Abuse-Focused Cognitive-Behavioral Therapy (AF-CBT), target families with abusive parents from a cognitive-behavioral and family therapy approach (Kolko, Iselin, & Gully, 2011). AF-CBT has been found to effectively reduce externalizing behaviors, fear, sadness, and anxiety in children ages 2 to 5 (Kolko et al., 2011).

Future Considerations for the PTSD-6U Subtype

Because the PTSD-6U subtype is relatively new, future research will likely focus on the validity of this diagnosis and the need for any additional changes. Experts in the field have called for more research on the compounding effects of trauma, given that co-occurring traumatic exposures have been linked to the development of PTSD and other developmental disturbances (Lieberman, Van Horn, & Ippen, 2005; Pynoos et al., 2009). In addition, the current version of the DSM includes limited information on the prevalence, epidemiology, and comorbidity for young children with PTSD, suggesting a need for more research in these areas to improve coverage of this information in future editions.

Currently, children must demonstrate significant impairment or distress in order to meet criteria for PTSD. Rather than using clinical impairment or distress as the sole benchmarks, some researchers have argued that future revisions should also include disturbances in developmental trajectories in this criterion (Pynoos et al., 2009). Such disturbances may include regressions or accelerations in development and may be associated with long-term consequences (Pynoos et al., 2009).

In considering other possible areas of improvement for the PTSD-6U subtype, research has suggested that there are developmental differences that may affect diagnosis within the subgroup of children 6 and under (e.g., Scheeringa et al., 2003). For example, children between ages 12 months and 3 years exhibit more Cluster B symptoms, including intrusive thoughts and nightmares, relative to children between ages 4 and 6 years (Scheeringa et al., 2003). These results are unsurprising however, when considered from a developmental psychology framework. For example, Jean Piaget's theory of child development suggests several states of cognitive and affective development through childhood that are encompassed within the birth to 6 age range (Piaget & Inhelder, 2008). The sensorimotor stage, for example, is from birth to age 2 years and is comprised of six substages, such as the development of first habits and primary circular reactions (e.g., sucking thumb) between 1 and 4 months and intentional, goal directed behavior between 8 and 12 months (Piaget & Inhelder, 2008). Children between ages 2 and 7 years are considered to be in the preoperational stage, which is comprised of two substages that include developing skills of pretend play and language (Piaget & Inhelder, 2008). It is possible that children in these developmental stages or substages may display diverse reactions to trauma based on their levels of cognitive and affective development. For example, based on Piaget's theory, one might expect that children exposed to trauma between 1 and 4 months will experience disruptions or a slowing of their habit development. Children exposed to trauma between ages 2 and 4 however, may not demonstrate this reaction because their habits and primary circular reactions have already formed, and may instead be more likely to display posttraumatic reactions through pretend play since they are actively developing this new skill. As such, consideration of these developmental processes, and ways in which they may be disrupted, may prove useful during future efforts to refine the PTSD-6U subtype.

While it may be helpful to consider the nuances of cognitive and affective processes during these stages of development when diagnosing PTSD in young children, there has been little research on more specific developmental subgroups within the 6 and under age range. Therefore, future studies should work within a developmental psychology framework to expand this area by examining how children across these developmental periods present differently following traumatic events to inform future diagnostic revisions and procedures.

In addition to the limited research on PTSD in children 6 and under, research on PTSD in school-aged children and adolescents has also proved lacking. PTSD criteria in the DSM-IV-TR were not developed based on individuals under 15 years old, and research has not examined the presentation of this disorder among a diverse age range. Some of the researchers who are proponents of the PTSD-6U subtype have also recommended a subtype for school-aged children and young adolescents (Scheeringa, Zeanah, et al., 2011). According to Scheeringa, Zeanah, et al. (2011), such a subtype would likely include some of the same revisions as the 6 and under subtype (e.g., reducing thresholds). While it is unclear whether future revisions of the DSM will include an additional subtype for school-aged children and young adolescents, it is clear that more research is required on the presentation of PTSD across these distinct developmental groups.

Conclusions

Clinicians must always consider developmental differences in the manifestations of psychological disorders, as symptoms sometimes present differently in children than in adults. However, in most cases, the same diagnostic criteria are used for all clients, regardless of age or other potentially relevant demographic factors. The PTSD-6U subtype is unique in that it is one of the first developmental subtypes of an existing psychological disorder to be included in the DSM. This marks a significant step in how the mental health field classifies disorders. The creation and inclusion of this subtype also provides an opportunity for developmental subtypes to be considered for additional disorders where indicated by clinical observations and empirical research. Thus, the purpose of this article was to provide a review of the development and validation of the PTSD-6U criteria, to discuss assessment and treatment considerations when diagnosing PTSD in young children, and to explore areas where further examination may increase the utility of this and future age- or developmentally-based subtypes.

Although evidence appears to support the creation of the PTSD-6U subtype in the DSM-5, more research is clearly needed to assess the continued utility of the diagnosis and any revisions that may be required to improve its ability to inform assessment and treatment of this type of PTSD. Overall, however, the PTSD-6U subtype provides an excellent example of ways in which behaviorally-anchored, developmentally appropriate criteria may be included within a DSM-5 diagnosis in a clear and clinician-friendly way. The use of this model may lead to the inclusion of additional subtypes in future revisions, not only within PTSD, but also within other disorders. For example, research suggests that pediatric mania presents atypically when compared to adult bipolar disorder, which may account for the misdiagnosis of children with bipolar disorder earlier in life (Biederman et al., 2000). Therefore, the PTSD-6U subtype has laid the foundation for establishing criteria for developmental subtypes among other disorders, such as bipolar disorder. However, it is important to consider the potential implications of a movement toward a diagnostic system comprised of subtypes. For example, a move toward models where developmental levels categorize subtypes of DSM disorders could elicit the creation of other demographically based subtypes (e.g., subtypes based on gender) that may actually complicate and confuse the diagnostic, assessment, and treatment procedures for these disorders.

Overall, the PTSD-6U subtype signifies a step toward providing enhanced identification for diagnosticians and toward promoting developmentally competent symptom assessment and interpretation. However, future revisions of the DSM, whether for PTSD or other disorders, should prioritize one primary goal: to further refine symptom criteria to increase diagnostic sensitivity through better understanding of the effect of developmental maturity on symptom presentation.

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Age Differences in the Content of Self-Defining Autobiographical Memories

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Research has consistently shown that age is related to phenomenological memory characteristics (e.g., increased vividness is associated with increased age). However, little research has examined age-related qualitative differences in autobiographical memories. Thus, the purpose of the current study was to examine qualitative differences in the content of self-defining memories across age. Two hundred sixty-one individuals between the ages of 18 and 94 provided self-defining memory descriptions that were systematically categorized as part of a content analysis. No meaningful differences in content were identified across the three age groups. Word analysis was also conducted, and no differences in word choice were found across age. Results therefore suggest that the content of and the words used to describe self-defining memories are not significantly influenced by age.

Keywords: aging, autobiographical memory, positivity effect, self-defining memory

Autobiographical memories are characterized by and can be rated based on several different phenomenological features. These features include details related to sensory information (e.g., visual images, smells, tastes), contextual information (e.g., individuals present at the event, the time when and the place where the event occurred), and affective information (e.g., feelings experienced during the event) associated with recollecting a past event from one's personal history. These phenomenological features are also characteristic of a subset of autobiographical memories, called self-defining memories (SDMs). Self-defining memories are considered to be central to an individual's personal identity. In an earlier study, Singer, Rexhaj, and Baddeley (2007) described SDMs as "vivid, emotionally intense, repetitively recalled, linked thematically to similar memories, and focused on enduring concerns or unresolved conflicts" (p. 886). Research indicates that ratings of phenomenological characteristics of autobiographical memories, and of SDMs specifically, may differ across age.

Siedlecki, Hicks, and Kornhauser (2015) found that age was significantly correlated with a number of phenomenological memory characteristics for SDMs of high personal meaning. Increased age was associated with greater vividness, coherence, sensory detail, time clarity, taking a first-person perspective, and less distancing (Siedlecki et al., 2015). These age-related differences were consistent with previous research by Comblain, D'Argembeau, and Van der Linden (2005), who found that older adults rated their memories as more vivid, containing more details, and less complex than did younger adults. Moreover, older adults showed greater clarity of the memory for the moment when the event took place compared to younger adults. Similarly, Singer and colleagues (2007) found that older adults rated SDMs as more vivid and important than did a sample of college students. Thus, research has consistently shown quantitative differences in ratings of memory characteristics across age, but few studies have taken the content of the memories into account. The purpose

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of the current paper is to examine, using quantitative analyses, whether there are also differences in content across age.

Examining the content of memories that individuals select will allow us to examine qualitative differences in SDMs across age and may also help to explain why there are age-related differences in ratings of phenomenological characteristics in autobiographical memories. For instance, when asked to rate characteristics of autobiographical memories, older adults have been shown to report more memories that contain themes of growth and integration (Bauer, McAdams, & Sakaeda, 2005), life lessons, and self-transformation (Pasputhi & Mansour, 2006) as compared to younger adults. These findings are consistent with research showing that individuals evaluate past events as more positive, or less negative, as they get older (Comblain et al., 2005; Gallo, Korthauer, McDonough, Teshale & Johnson, 2011; Schlagman, Schulz, & Kvavikashvili, 2006). This finding is referred to as the positivity effect. The positivity effect refers to findings that older adults remember more positive information relative to negative information as compared to younger adults. This effect may represent motivational changes with increasing age to focus on the importance of emotional satisfaction in old age, consistent with the socioemotional selectivity theory of aging (Carstensen, Isaacowitz, & Charles, 1999). Specifically, the socioemotional selectivity theory maintains that a motivational shift takes place in the latter portion of an individual’s life, and the perception of limited time left in life leads individuals to prioritize their attention on emotionally meaningful goals. Carstensen and colleagues (1999) explain that time is perceived as open-ended in early adulthood, motivating individuals to pursue knowledge-related goals and novel experiences. Alternatively, as time constraints become more apparent and individuals grow more aware of their own mortality, older adults tend to focus more on emotional satisfaction, maximizing positive affect and minimizing negative affect to enhance well-being, often through emotionally satisfying relationships. This shift may motivate older adults to select SDMs with themes that differ from younger adults, which may account for some of the differences in phenomenological ratings of SDMs across age.

De Vries et al. (1995) found that in personal memories within a life review, older adults' memories contained fewer themes of relationships compared to younger and middle-aged adults and contained more themes of life-threatening situations, such as illness and injury. Singer et al. (2007) extended this research by examining the content of SDMs across age groups and hypothesized that older adults’ SDMs would contain fewer relationship themes and more life-threatening themes as compared to younger adults. Singer et al. (2007) failed to replicate the findings reported by DeVries et al. (1995) and instead found that older adults reported memories that were more positive in tone and contained more integrative meaning. Thus, in line with findings reported by Singer et al. (2007) and consistent with the socioemotional selectivity theory, we expect that older adults’ memories will contain fewer achievement-related themes and more themes related to relationships than younger age groups, as this aligns with older adults’ shift in motivation toward emotionally satisfying endeavors and relationships. Furthermore, it is expected that older adults will use more positive words and/or fewer negative words when describing their SDMs compared to middle-aged and younger adults in line with the positivity effect and previous research (Comblain et al., 2005; Gallo, Korthauer, McDonough, Teshale & Johnson, 2011; Schlagman, Schulz, & Kvavikashvili, 2006).

There is some evidence that the content of autobiographical memories may vary across age. Specifically, Schlagman et al. (2006) asked a sample of young adults and older adults to describe involuntary autobiographical memories that they spontaneously experienced throughout the period of 1 week. The authors completed a content analysis using systematic categorization and found that the presence of certain themes in memories differed across the age groups. Specifically, they found that there were a greater percentage of accident/illness, stress events, and conversation-related categories present within memories of the young adults and a greater percentage of traveling/journeys category present within memories of the older adults. In addition, older adults were less likely to recall memories with negative themes.

However, not all researchers find age-related differences in the content of autobiographical memories. For example, although Singer et al. (2007) found that compared to college students, older adults' SDMs were rated as more positive, included more summary memories, and were more likely to contain "integrative meaning" than SDMs described by younger adults. However, there were no differences in the content of the memories, as classified in seven categories (experiences with life threatening themes, relationships, recreation, achievement, guilt, drug and alcohol themes, and unclassifiable).

In addition to the content of SDMs, word choice used to describe these memories may also vary across age. According to Tausczik and Pennebaker (2010), word usage is the most fundamental way to communicate internal thoughts and emotions. In light of these findings, we chose to concurrently analyze text content and word usage to determine if there are differences in SDMs across age. Rice and Pasupathi (2010) analyzed self-narratives and noted that older adults tend to use lower levels of present tense words, fewer self-focused pronouns, and greater numbers of words indicating positive emotions for self-discrepant and self-confirming events. Thus, the current study also utilized a word analysis technique, but assessed SDMs rather than self-narratives. To our knowledge, this is the first study to incorporate text analysis of SDMs.

In the current study, we were interested in exploring possible qualitative differences in the content of an SDM such as, what types of memories were selected, and how did types of memories differ in content across age? We also examined differences in word usage in SDMs across age. In addition, we were particularly interested in whether the content and the description of the memories were more positive in the older sample as compared to the younger sample, as would be expected from findings related to the positivity effect and socioemotional selectivity theory.

Method

Participants

Two hundred sixty-one participants (ages 18-94 years; M_{age}= 54.06; SD = 16.77) provided summaries of a SDM. Three age groups were created; the young group comprised individuals between the ages of 18 and 40 years (n = 75; M_{age} = 31.87; SD = 6.76), the middle-age group consisted of individuals between the ages of 41 and 64 years (n = 93; M_{age} = 54.90; SD = 6.31) and the older group comprised individuals between 65 and 94 years of age (n = 93; M_{age} = 71.12; SD = 4.63). The age ranges included in each group were chosen to have a large enough sample within each group and are also consistent with previous research that has categorized participants into younger, middle, and older adult age groups (e.g., Salthouse, 2013; Salthouse, 2016; Siedlecki et al., 2015). There were no significant differences between the three age groups in terms of self-reported health, $F(2, 258)$ = 2.70, p = .069, or levels of education, $F(2, 258)$ = 2.22, p = .111. Participants were recruited through Surveymonkey.com and completed a survey online. Additional information about the sample recruitment can be found in Siedlecki et al. (2015). Participant demographic characteristics are provided in Table 1.

Materials

Memory Experiences Questionnaire. The Memory Experiences Questionnaire (MEQ; Sutin & Robins, 2007) measures 10 categories of phenomenological characteristics of autobiographical memory, including vividness, coherence, accessibility, sensory detail, emotional intensity, visual perspective, time perspective, sharing, distancing, and emotional valence. In the present study, participants completed a slightly shortened version of the MEQ for two separate memories, one of which asked participants to select a memory of any kind, and the other asked participants to report a self-defining memory. The following instructions were given to participants:

> Please select a memory that is PERSONALLY MEANINGFUL to you, it can be either positive or negative, but it should convey the most important experience you have had that helps you to understand who you are and how you arrived at your current identity. It may be a memory about any kind of experience, but it should be something you have thought about many times and is still important to you, even as you are recalling it now. Please remember that the memory you choose

Table 1
Participant Demographic Characteristics

	Total *N* = 261	Young (ages 18-40 years) *n* = 75	Middle (ages 41-64 years) *n* = 93	Older (ages 65-94 years) *n* = 93
Mean Age	54.1 (16.8)	31.9 (6.8)	54.9 (6.3)	71.1 (4.6)
Gender (%)				
Female	59.9	54.7	58.1	66.7
Male	39.3	45.3	41.9	32.2
Not reported	0.8	0	0	1.1
Race (%)				
American Indian/Alaska native	0.8	0	1.1	1.1
Asian	2.7	2.7	2.1	3.2
Native Hawaiian/Pacific Islander	0.4	0	1.1	0
Black	5.3	6.7	6.4	3.2
White	85.5	80.0	84.9	91.4
Hispanic	6.2	14.7	4.3	1.1
More than one	1.9	4.0	2.2	0
Other	2.3	5.3	2.2	0
Missing	1.1	1.3	0	1.1
Mean Education, years	15.0 (2.7)	14.7 (2.4)	14.8 (2.5)	15.5 (3.0)
Mean Health, self-report	2.5 (1.0)	2.4 (0.9)	2.7 (1.1)	2.4 (1.0)

Note. Standard deviations are listed next to mean values in parentheses.

> should be a personal event that occurred only one time, at a particular place and date, and lasted less than one day.

Participants then typed a description of their SDM into an open-ended response section of the survey. The current study focused on the content analysis of participants' memory descriptions across age. The relationships between age and the phenomenological characteristics of the SDMs for these data are presented in Table 5 of Siedlecki et al. (2015). In these data, age was shown to be associated with increased vividness, increased coherence, increased sensory detail, increased field perspective, and increased time perspective.

Procedure

Content analysis. A content analysis using systematic categorization of themes (Thorne & McLean, 2001) was conducted in three steps by two independent coders who were blind to participant age.

Step 1. Thorne and Mclean's (2001) six themes for categorization of self-defining memories were utilized. Each independent coder was first trained to use the coding scheme before accessing the data. Categories suggested by Thorne and McLean (2001) include "life threatening event," "recreation/exploration," "relationships," "achievement/mastery," "guilt/shame," "drugs, alcohol, or tobacco use," and "event not classifiable."

Step 2. The two independent coders placed each memory into the appropriate memory theme category by reading each memory and indicating whether a particular category was present. Coders were instructed to choose only one category and to take brief notes on their selections. Once completed, coder agreement was calculated. Across the categories, the mean Cohen's kappa coefficient (k) of interrater agreement between the two coders was .40.

Table 2
Relative Frequencies of Content Categories Across Age

			Young *n* = 75		Middle *n* = 93		Older *n* = 93	
	χ^2	*p*	N	%	N	%	N	%
Life Threatening	0.40	0.820	20	26.7	22	23.7	21	22.6
Recreation/ Exploration	0.07	0.967	7	9.3	9	9.7	8	8.6
Relationships	0.91	0.635	20	26.7	19	20.4	22	23.7
Achievement & Mastery	5.49	0.064	17	22.7	34	36.6	36	38.7
Guilt and Shame	--	--	4	5.3	1	1.1	0	0.0
Event Not Classifiable	0.53	0.769	7	9.3	8	8.6	6	6.5

Note. [a]Three cells have an expected count less than 5; *$p < .05$.

Differences in the categorization can be attributed to the fact that many of the memories contained complex concepts that could be included in more than one category.

Step 3. To address this issue, the coders went through each of the memories individually and compared their notes about its categorization in order to agree upon a final categorization. No memories were ultimately categorized as being part of the drugs, alcohol, or tobacco use category, thus this category was removed from subsequent analyses.

Word analysis. Differences in the word choice within the text of participants' SDM descriptions were examined with the newest version of the Linguistic Inquiry Word Count (LIWC) software (Pennebaker, Booth, & Francis, 2007), which calculates the frequencies of words from certain categories that are predefined by the creators of the program (e.g., words such as 'accept,' 'affection,' and 'appreciate' were considered part of the Positive Emotions category). Several studies have provided support for the validity of the LIWC program (e.g., Hirsch & Peterson, 2009; Pennebaker, Chung, Ireland, Gonzales & Booth, 2007; Rice & Pasputhi, 2010).

Results

Content Analysis of SDMs

Of the five content analysis themes, the most common category across the entire sample was related to achievement/mastery (33.6%, *n* = 88). Self-defining memories related to achievement/ mastery included obtaining a driver's license, having a child graduate from high school, and graduating from graduate school. Life threatening event was the second most common theme to emerge across the entire sample (24%, *n* = 63). This type of memory contained themes related to death, life threatening experiences and severe distress, including memories related to death of a parent, death of a spouse, and car accidents. SDMs classified in the relationship category included positive experiences (e.g., the birth of a child, the start of a new relationship) and also negative experiences (e.g., the discontinuing of a

Table 3

Correlations Between Age and Word Analysis Categories

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	1												
2. Word Count	-.05	1											
3. Social processes	.05	-.13*	1										
4. Family	.01	-.22**	.51**	1									
5. Friends	-.01	.00	.05	-.10	1								
6. Affective processes	-.06	.04	-.02	-.09	.08	1							
7. Positive emotion	-.03	.02	.03	-.04	.10	.89**	1						
8. Negative emotion	-.06	.05	-.10	-.09	-.03	.40**	-.07	1					
9. Cognitive processes	-.07	.35**	-.09	-.17**	.08	.05	.00	.09	1				
10. Leisure	.06	-.08	.00	-.02	-.04	.03	.07	-.06	-.09	1			
11. Achievement	.06	-.11	.09	-.12*	.03	.28**	.16**	.28**	-.08	-.02	1		
12. Work	-.03	-.07	.23**	-.13*	-.05	-.09	-.05	-.09	-.08	.00	-.04	1	
13. Religion	-.01	-.07	-.03	-.10	-.04	.04	.05	-.06	-.08	.01	-.08	-.05	1
14. Death	.05	-.09	.10	.22**	-.03	-.06	-.06	-.01	-.09	-.04	-.08	-.05	-.03

Note. *$p < .05$; **$p < .01$.

Table 4

Correlations between Memories within Content Themes and Word Analysis Categories

	Content Themes					
	Life Threatening	Recreation/ Exploration	Relationships	Achievement	Guilt and Shame	Event Not Classifiable
Social processes	.01	-.05	.36**	-.19**	-.06	-.17**
Family	.07	-.05	.14*	-.05	-.06	-.16**
Friends	-.05	.04	.17**	-.13*	.01	-.03
Affective processes	-.02	-.01	.12*	-.09	.03	.00
Positive emotion	-.17**	.09	.21**	-.04	-.01	-.08
Negative emotion	.19**	-.13*	-.07	-.11	.06	.11
Cognitive processes	-.03	-.07	.16*	-.11	.03	.04
Leisure	-.09	.29**	-.05	-.02	-.03	-.03
Achievement	-.07	-.04	-.01	.08	-.02	.04
Work	-.14*	-.01	-.12	.24**	-.02	.00
Religion	-.11	.05	-.09	.16**	-.02	-.03
Death	.32**	-.06	-.10	-.13*	-.01	-.05

Note. *$p < .05$, **$p < .01$.

relationship with a parent; 23.3%, $n = 61$). SDMs classified in the recreation category (9.2%, $n = 24$) included learning how to play a sport and attending a music concert. Twenty-one memories (8%) were included in the event not classifiable category. Examples in this category included losing a substantial amount of weight and arriving late for a meeting. Five memories were classified into the guilt and shame category (1.9%, $n = 5$). As mentioned above, no memories were categorized into the drugs, alcohol, or tobacco use category.

Age Differences in the Content of the SDMs

Chi square analyses were conducted to determine whether the frequency of content categories varied across the three age groups. Chi square values and relative frequencies of content categories across age are reported in Table 2. Results indicate that the content of SDMs did not significantly differ across age.

Word Analysis

Word analyses were conducted on SDMs by determining the proportion of words that counted toward a particular word category (e.g., social processes, family, friends, affective processes, etc.) over the total number of words used to describe the memory. There were no significant differences in total word count in the SDMs across young (M = 43.53, SD = 57.10), middle-aged (M = 34.84, SD = 32.00), and older adults (M = 39.31, SD = 33.79), $F(2, 258) = .93$, $p = .398$. The correlations between age and the word variables are presented in Table 3. Consistent with results of the content analysis, there were no significant relationships among age and the types of words used when asked to describe an SDM. In fact, all the correlations between age and the categories were less than .08, suggesting there was essentially no relationship between word usage and age. In particular, there were no significant correlations between age and the use of positive or negative words in the memory descriptions. Although there was no relationship found between age and word selection, several word categories did correlate with content categories. For example, memories that were categorized as life threatening were significantly less likely to contain words with positive emotions ($r = -.17$, $p < .01$), and were more likely to contain words consistent with the negative emotion word category ($r = .20$, $p < .01$). Memories classified as containing a relationship theme had positive associations with several word categories, such that memories that contained a relationship theme were more likely to include words that comprised social processes ($r = .36$, $p < .01$), family ($r = .14$, $p < .05$), friends ($r = .17$, $p < .01$), affective processes ($r = .12$, $p < .05$), and positive emotion ($r = .21$, $p < .01$). The correlations between content themes and word categories are reported in Table 3.

Discussion

Previous research has found differences in phenomenological characteristics of autobiographical memories across age (e.g., Comblain et al., 2005; Montebarocci, Luchetti, & Sutin, 2014; Siedlecki et al., 2015; Singer et al., 2007). The goal of the current study was to determine whether there were also differences in the content of SDMs across age, with a focus on examining potential differences in the positivity in the memories. Results of the current study did not reveal any meaningful differences between the content or word choice of SDM descriptions across age.

The lack of meaningful differences in content across age is consistent with findings reported by Singer et al. (2007) who found no significant differences in the memories that younger and older adults described. In contrast, Schlagman et al. (2006) identified differences in the content of memories across age. These mixed results may be a function of different methodologies. In addition, the types of memories that participants were instructed to recall differed across the studies as well. For example, the current study required individuals to report voluntary SDMs while Schlagman et al. (2006) examined involuntary memories. Moreover, Alea et al. (2004) found that older adults reported more negative emotions (e.g., sadness) when reporting memories of the OJ Simpson verdict compared to younger adults. According to Alea and colleagues (2004), older adults may be able to suppress negative emotions with everyday events but may not be able to do this when a memory is personally meaningful.

Previous research has demonstrated the positivity effect, most of these studies include laboratory stimuli that may not be meaningful to participants. In contrast, because autobiographical memories are more personally relevant and are deemed more important, it may be difficult for participants to regulate emotions associated with these particular memories, which could serve as an explanation as to why no differences in SDM content was found across age. In essence, it is possible that the positivity effect is less evident when personally relevant, meaningful stimuli, such as SDMs, are utilized as opposed to laboratory stimuli (Alea et al., 2004; Siedlecki et al., 2015). This is an important distinction to make because it may provide more nuance to our understanding of the positivity effect; this phenomenon may not be a universal experience of all older adults in all contexts but may depend greatly on the stimuli or information being considered or recalled.

Interestingly, the most common theme described in the SDMs across the three age groups was related to achievement/mastery. It should be noted, however, that the categorization guidelines include a wide variety of topics (e.g., winning a competition, getting one's braces off, getting into college, child birth, religion, embracing ethnic heritage) that fall into this category (Thorne & Mclean, 2001). The wide variety of topics that can be classified as achievement/mastery may account for its prevalence in the current sample. Our findings suggest that achievement/mastery are important sources of self-defining memories across adulthood, irrespective of age.

Text analysis of each SDM revealed several significant associations between different word categories and content themes. However, there were no associations between age and text used to describe the SDM. In particular, there was no evidence that age was associated with the use of more positive or less negative words, which would be expected from findings related to the positivity effect. Although consistent with the results of our content analysis, the lack of association between age and text are in contrast to findings reported by Pennebaker and Stone (2003) and Rice and Pasputhi (2010), both of whom found strong age differences in language used in participant narratives. Differences in methodology utilized in studies that have identified age differences in language usage may explain why no significant findings were observed in the current study. For example, Rice and Pasputhi (2010) required participants to recall an experience from the prior month that was either self-discrepant or self-consistent, and Pennebaker and Stone (2003) analyzed participants' writing styles about either emotional or superficial events. However, as discussed by Pennebaker and Stone (2003), the LIWC word analysis technique cannot consider context, humor, and sarcasm when analyzing the words a participant utilizes to describe their memories. This is a limitation of the current study and thus may explain why there were no significant relationships identified between age and text use. It is important to note, however, although LIWC failed to capture the thematic essence of narratives provided by participants, this software has been validated and utilized in previous research to assess word choice (Pennebaker & Stone, 2003; Rice & Pasputhi, 2010). Thus, it was an appropriate analytic approach for the current study's purposes, but future studies may seek to assess word choice within the broader context of the memory description. Another limitation of the present study was that a large majority of the participants identified as white, so it is unclear whether similar results would be replicated in a more diverse sample. Finally, it is worth noting that much research examining SDMs elicit several from each participant (e.g., Singer et al., 2007). In the current study, we had participants retrieve a singular SDM. As a result, the full range of personal SDMs were unlikely to have been captured in the current study.

In conclusion, we found that age was not associated with differences in the content of SDMs or with SDM descriptive word choices, thus our hypotheses were not supported. Although there are age-related differences in phenomenological ratings of SDMs, it is unlikely that these differences can be attributed to differences in content or word choice. Future studies should continue to examine the variety of roles SDMs play across the lifespan as well as investigate other possible explanations for age-related differences in phenomenological ratings. For instance, it is possible that reflective functioning is another factor that may impact individuals' SDMs across age. According to Katznelson (2014), "mentalization, or reflective functioning, has been defined as the capacity to understand and interpret – implicitly and explicitly – one's own and others' behavior as an expression of mental states such as feelings, thoughts, fantasies, beliefs and desires" (p. 108). It is possible that over the course of a lifespan, older adults may have had the opportunity to hone their ability to engage in reflective functioning. As a result, the phenomenological differences of SDMs across age may be related to differences in reflective functioning, rather than the content of the SDMs; thus, future studies may investigate the relationship between reflective functioning and SDMs across age. Additionally, future research should also examine psychological distance of the stimuli to further ascertain whether relevance of the memory could serve as a moderator for the positivity effect. In conclusion, content and word choice of SDMs did not differ across age, but additional research should continue to focus on the complexities of memory storage, encoding, and retrieval in relation to aging and autobiographical memory.

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A History of Routine Outcome Measurement in Clinical Practice: A Review of Evidence and Issues

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Over the last several decades, psychologists have come under increasing pressure to empirically demonstrate the efficacy of the clinical interventions they implement. Towards this end, Routine Outcome Monitoring (ROM) has been repeatedly shown to utilize feedback to enhance treatment outcomes by way of capturing negative changes that may otherwise lead to treatment failures. Despite the documented benefits of incorporating ROM into clinical practice, research suggests that the majority of clinicians in the United States have not done so and instead continue to base treatment planning decisions and assessments of client progress through the more subjective clinical interpretation. The reasons that practicing clinicians choose not to utilize ROM appear to be both practical and philosophical in nature. In order to better understand factors that affect ROM use among clinicians, this paper summarizes the origins of ROM and the contexts in which it currently exists, as well as research documenting the potential benefits of ROM and the ways in which it enhances treatment outcomes. Frequently endorsed reasons that practicing clinicians do not collect outcome data include the cost and time needed for regularly administering and interpreting measures, and concerns about the usefulness of this information in treatment. These challenges are discussed and considered alongside findings from the ROM literature. The limitations of ROM are also discussed, such as disorders and populations in which publicly available ROMs are needed, the lack of investigation into how clinicians' therapeutic orientations affect implementing ROM in practice, and the immutable need to interpret data using clinical judgement. Future directions for research and practice using ROM are reviewed as well.

Keywords: Routine Outcome Monitoring (ROM), feedback-informed treatment, assessment, patient reported outcomes

Over the last few decades, the field of psychology has come under pressure to empirically demonstrate treatment efficacy. In this context, psychological measures have emerged and evolved to include evaluation of treatment outcome, allowing patients, mental health providers, and managed care systems to more systematically evaluate quality of care (Howard, Moras, Brill, Martinovich, & Lutz, 1996). Since its inception, the ways in which Routine Outcome Monitoring (ROM) enhances treatment outcomes have been well documented and are becoming increasingly integrated into the mental health systems in numerous countries, including the United Kingdom, Australia, and New Zealand (Boswell, Kraus, Miller, & Lambert, 2013; Burgess, Coombs, Clarke, Dickson, & Pirkis, 2012). However, the literature also indicates that ROM has been slower to take hold in United States' mental health care systems (Hatfield & Ogles, 2004; Mours, Campbell, Gathercoal, & Peterson, 2009; The Kennedy Forum, 2015a), despite support from the American Psychological Association (APA; Ackerman et al., 2001). This paper presents a review of the literature to better understand the factors that facilitate and impede the use of ROM in clinical practice in the United States. Implications for healthcare delivery are also discussed.

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Mental Health and Outcome Assessment

Recently, mental health parity laws have been established to guarantee that insurers and employers cover mental health services to the same extent that they cover medical and surgical procedures (Centers for Medicare & Medicaid Services, 2013), provided that they meet the regulation's ensuring quality care for patients. These policies were also put in place to make certain that services provided were necessary and have been empirically shown to be efficacious for treating a given condition (American Psychological Association, 2011; Jensen-Doss, 2015).

For healthcare providers, there is a growing emphasis on incorporating evidence-based treatments and determining necessity of treatments by tracking outcomes using outcome assessments. Outcome assessment is an evaluative method of measuring patients' view on aspects of their health status over the course of treatment. Since the passing of the Affordable Care Act in 2010, there has been a push for providers to treat their patients using effective and cost-efficient means of treatment (Obama, 2016; Jensen-Doss, 2015). This has resulted in placing a higher value on patient reported outcomes to document patients' functional improvements. The importance of functional improvement is largely tied to John Ware's pioneering work in the 1970s and 1980s (Brook et al., 2006; Ware et al., 1980; Ware, Davies, & Stewart, 1977). Ware's patient-focused research aimed to develop and incorporate measures of patient's self-reported satisfaction with their health and functioning. These self-reports were considered vital indicators of changes in patients' perceived quality of life (QOL), and were among the first used to demonstrate an association between QOL and health outcomes. Following Ware, several standardized patient reported outcome (PRO) assessments were developed, including the 36-item Short-Form Health Survey (SF-36), the most widely-used patient-reported health survey in the world, currently employed by researchers, clinicians, and insurers to monitor and assess treatment outcomes as a function of changes in QOL (Busija et al., 2011; Ware, Snow, Kosinski, Gandek, & Institute, 1993).

Outcome assessment emerged when Howard and colleagues (1996) proposed that clinicians would benefit from establishing a means of comparing treatment effectiveness by regularly obtaining data regarding a client's progress through the frequent administration of standardized session-to-session psychological assessments. This process uses patient feedback to monitor progress over time by answering the following question: is this treatment, administered under these circumstances and at this point in time, helpful to this particular patient (Howard et al., 1996)? This model of incorporating patient-focused information into the process of evaluating effectiveness reflects early conceptions of ROM. Today, outcome measures are psychological tests that aid clinicians in treatment by providing empirical data regarding the internal psychological states of patients receiving treatment. Outcome measures offer an evaluation of treatment effectiveness and indicate the need for treatment modifications (Hunsley & Mash, 2007; Jacobs, 2009).

In addition to providing the means for comparative efficacy of treatments used in care and in clinical trials, the last decade of research has demonstrated the benefits of ROM in bolstering treatment outcomes. In the context of ongoing mental health parity legislation (Centers for Medicare & Medicaid Services, 2013) and the APA's growing emphasis on the use of evidence-based practices (EBP), the accumulating research has resulted in recommendations for clinicians to employ principles of ROM to enhance outcomes for their patients. In 2005, the APA Council of Representatives made a policy statement introducing evidence-based practices in psychology (EBPP). Their report described practices that integrate the best available research with clinical expertise to promote effective psychological practice through the application of empirically supported principles of psychological assessment, case formulation, therapeutic relationship, and intervention (American Psychological Association, 2005). In 2006, the APA Presidential Task Force grouped common outcome monitoring practices and ideas, such as quantifying diagnostic judgments or measuring the progress of therapy over time, into recommendations for the field of psychology (APA Presidential Task Force on Evidence-Based Practice, 2006). Since then, the idea of collecting and analyzing outcome data has gained traction, with some researchers beginning to develop all-encompassing systems to make integrating ROM easier and more effective (Brown, Burlingame, Lambert, Jones, & Vaccaro, 2001; “Owl Insights,” 2017).

Support for Incorporating ROM into Psychological Practice

As many familiar with the ROM literary landscape may be aware, there exists a distinction between outcome and process measurement and the benefits yielded by each. Broadly speaking, process measures typically evaluate the dynamic variables which may influence treatment (e.g., therapeutic alliance, readiness to change, family involvement, cultural competence); whereas outcome measures are chiefly concerned with assessing for a change in patients’ presenting symptoms, their overall sense of well-being, or their satisfaction with treatment (Hermann et al., 2002; Kilbourne et al., 2018; Lilford, Brown, & Nicholl, 2007; Miller, Duncan, Brown, Sorrell, & Chalk, 2006; Miller, Hubble, Chow, & Seidel, 2015). Nonetheless, this distinction is not always clear, with some studies using the terms interchangeably to discuss similar concepts (Jensen-Doss, 2015; Scott & Lewis, 2015). This overlap of routine outcome measurement and process measurement makes discussion and dissemination of principles of ROM more difficult. Hence it is necessary to establish a clear and common language before the field can further explore the practice of ROM. In light of this, the remainder of this review will operationalize and discuss ROM using the following definition from within the literature: ROM employs repeatable and brief psychological tests with good psychometric properties to obtain feedback about client progress, their symptoms, and the process of care, particularly if clients are experiencing negative change or deterioration (Peterson & Fagan, 2017).

Benefits Shared by Clients and Clinicians

When ROM is not incorporated, clinicians mainly rely on their clinical expertise for treatment decisions and evaluations (Lyon, Dorsey, Pullmann, Silbaugh-Cowdin, & Berliner, 2015). While the majority of clinicians today indicate that they continue to practice in this way (Edbrooke-Childs et al., 2017; Hatfield & Ogles, 2004; Mours et al., 2009), research has found that incorporating ROM into practice enhances the effectiveness of interventions and clinicians in multiple ways (Boswell et al., 2013).

Boswell and colleagues (2013) reported that one of the largest benefits of ROM endorsed by practitioners is the ability to detect negative change or treatment failure in patients. Furthermore, in cases where the client is more prone to negative outcomes, Boswell and colleagues (2013) suggested that the feedback obtained in routinely measuring outcomes can help identify these situations early in the therapeutic process, allowing for adjustments and treatment alternatives as necessary. Whipple, Lambert, Vermeersch, Smart, Nielsen, and Hawkins (2003) demonstrated that compared to clinicians who received no feedback about the therapeutic process, clinicians using outcome measures combined with information from a clinical support tool (measuring therapeutic relationship, motivation to change, and social support network) had more positive outcomes with clients at risk of treatment failure. They found that clients in ROM-informed treatment remained in therapy longer, had lower rates of deterioration, and nearly half exhibited significant improvements (based on post-treatment outcome measure score; Whipple et al., 2003). Miller and colleagues (2006) conducted a similar study following telephone-based therapists and their clients over a two-year-period. During this time, therapists began receiving continuous feedback regarding a client’s experience of treatment and the therapeutic relationship. After the initial phase of training and baseline data collection, therapists began using an automated clinical tool comprised of data from two brief measures of therapy outcome and process completed by clients at the start and end of each session, respectively. Results were immediately available for therapists to review through a computerized tracking system, which also provided a graph displaying a client’s previous scores as well as indicators and recommendations for when scores signaled risk for poor outcome (Miller et al., 2006). Consistent with the research of Whipple and colleagues (2003), their findings indicated that outcomes and treatment retention improved significantly when therapists obtained and utilized a continuous stream of feedback from clients (Miller et al., 2006). Moreover, the overall effect size of therapists' services doubled during the period where continuous feedback was provided. Taking the above into consideration, it would appear that in addition to detecting and protecting against negative change, routinely obtaining and evaluating feedback from clients has the potential to significantly enhance treatment effectiveness (Miller et al., 2006; Whipple et al., 2003).

Apart from these benefits, Scott and Lewis (2015) found that clients endorsed the helpfulness of completing the outcome measures – often that they have a better understanding of their disorders by quantifying their symptoms. Scott and Lewis (2015) also reported that youth clients demonstrate more active involvement in the therapeutic process and treatment decisions, and exhibit faster improvement in symptoms when treatments integrated self-report symptom scales.

Benefits for Clinicians

In addition to the reported benefits shared by the client and the clinician, researchers have documented the benefits for clinicians who implement ROM. For example, Scott and Lewis (2015) suggested that outcome measurements assist in collaborative care by helping to share important objective diagnostic and treatment data with multiple providers over the course of care. They added that this can be particularly helpful with cases of comorbid diagnoses and for reducing the potential for providers' subjective biases. Eells (2013) spoke to the issue of subjective bias in the following:

> I know that I am subject to the same cognitive biases that anyone else is, including overconfidence—imagining that treatment is going better than it actually is—as well as hindsight bias, or the tendency to imagine my impact on outcome was more predictable than it actually was; and confirmation bias, which is a tendency to overestimate my successes and underestimate my failures. All these biases keep me feeling fine as a clinician, but they don't contribute to improving my skills (Eells, 2013, p. 458).

Eells (2013) proposed that the feedback from outcome measurements offers a more objective view of client progress—one that is less susceptible to clinicians' subjective biases. Moreover, using empirically supported data in this way reduces errors that arise from inaccuracies in clinical impressions, thus improving patient outcomes, enhancing quality of care, and lessening overall amount of resources required to effectively treat clients (Eells, 2013; Jensen-Doss, 2015; Lambert, 2001).

Benefits for Others Within the Healthcare Ecology

Apart from the client and the clinician, there are other parties in the mental health ecology who gain from mental health professionals integrating ROM. The full breadth of the parties involved and the benefits afforded to them is beyond the scope of this article; however, it is worth briefly noting some macro-level benefits in employing ROM.

For clinical supervisors and trainees, ROM is beneficial by way of providing clinical data on trainees' growth, which can be used in supervision (Holt et al., 2015). Similarly, insurance companies may benefit from outcome measurement implementation by using the data to increase transparency of the services provided, for which they have gradually emphasized as a benchmark for reimbursement. ROM may also increase provider accountability by documenting reductions in symptom severity from a patient's point of view, which facilitates reimbursement over longer courses of treatment (The Kennedy Forum, 2015b). Moreover, what is helpful to the patient is often helpful to their family and loved ones. When a patient is participating in therapy in which ROM is used regularly to assess progress to track early signs of treatment failures, the chance for meaningful improvement increases while the risk of undetected deterioration and premature termination decreases (Boswell et al., 2013; Whipple et al., 2003). Naturally, compared with a patient experiencing undetected declines, a patient who is making progress would place less strain on their loved ones and caregivers (Martire et al., 2010; Mitsonis et al., 2012). Alongside the added benefits of ROM on the outcomes of psychotherapy, delivery of mental health services may become more cost-effective (The Kennedy Forum, 2015b). Cost-effective treatment can add additional relief for family members who are paying for the care of the patients, many of whom experience more severe symptoms. Taken together, ROM has the potential to fiscally benefit patients' families by lowering the number of sessions needed for successful treatment, as well as reducing the amount of resources wasted on unsuccessful treatments through improved effectiveness and early detection of treatment failure.

Common Challenges to Integrating ROM into Practice

Despite its alignment with EBP and the documented benefits that are linked to obtaining feedback from clients regarding their progress, symptoms, and the process of care, studies have found that the majority of practicing clinicians do not use outcome measurement in their everyday practice (Hatfield & Ogles, 2004; Mours et al., 2009). Furthermore, studies have reported that many of the clinicians who do routinely administer outcome measures rarely, if ever, utilize the information obtained in meaningful ways, such as for treatment planning or monitoring of client progress (Garland, Kruse, & Aarons, 2003; Lyon et al., 2015). Considering this, it is critical to review and address commonly endorsed reasons that practicing clinicians rely on their clinical judgment over using outcome measurement data to regularly monitor the progress of their clients (Hunsley & Mash, 2007). As described in greater detail below, research indicates that these obstacles are both practical or philosophical in nature (Boswell et al., 2013).

Using a national sample of psychologists, Hatfield and Ogles (2004) found that a common reason for not incorporating ROM was due to the cost of frequently administering outcome assessments in the context of organizations where resources may be scarce and providers are striving to keep healthcare costs down (Hatfield & Ogles, 2004). According to Boswell and colleagues (2013), ROM services are currently not reimbursed by a third-party-payer or a national health system. In other fields of health care services, most methods necessary for quality care do not require providers to pay out of pocket and are covered through insurance, whereas in ROM, the financial burden falls on the clinician if they are to have the measures available. This reason was among the highest endorsed by clinicians in Hatfield and Ogles's (2004) national survey, and was the top reason cited by APA internship training directors (Mours et al., 2009).

Research also suggests that widespread implementation of ROM may be impeded by the time needed to administer and interpret measures. Clinicians with heavy caseloads may feel that they lack the time necessary for various ROM activities, such as data collection, scoring and interpretation, generating reports, providing feedback, and the implementation of tracking systems to incorporate follow-up assessments (Boswell et al., 2013; Garland et al., 2003; Hatfield & Ogles, 2004; Mours et al., 2009; Scott & Lewis, 2015). Garland and colleagues (2003) reported that implementing ROM can require significant personnel resources and become an administrative burden. Hatfield and Ogles (2004) indicated that the resulting paperwork and time it takes to regularly administer outcome measures are among the top reasons endorsed by those who do not use outcome measures in practice. Similarly, among 407 APA internship sites, 48.7% of the clinical training directors at sites that do not utilize outcome measurement stated that having more time would facilitate their use (Mours et al., 2009). Boswell and colleagues (2013) alluded to the issue of time and resource allocation by saying:

> Time is everything to a busy behavioral health provider, and providers are often overscheduled. Many providers have reported feeling pressured to see clients even though they are probably too tired, distracted, or sick to give their clients their full effort… Routine data collection must be placed within this context; otherwise clinicians may rightly feel dismissed (Boswell et al., 2013, p.6).

Though lower on the list, psychologists have also endorsed concerns over the utility of ROM in treatment, such as feeling that clients' complexities do not lend themselves easily to measurement, believing that measure completion can be cumbersome to already burdened clients, and worrying that ROM risks distorting the effects of treatment (Hatfield & Ogles, 2004; Mours et al., 2009; Scott & Lewis, 2015). In a later analysis of their data, Hatfield and Ogles (2007) reported that concerns regarding the utility of outcome measures were rated higher by clinicians who identified as insight- (e.g., psychodynamic, humanistic) or eclectically-oriented (i.e., drawing from more than one therapeutic orientation) compared to cognitively- or behaviorally-oriented participants. They posited that these differences may be due to differences among orientations in terms of how they view process of therapy and client improvement (Hatfield & Ogles, 2007). For instance, while ROM was officially recognized as an EBP in 2006, the cognitive-behavioral orientation has a history of utilizing fundamental principles of ROM, such as measuring the internal psychological states of clients, using feedback to confirm or deny evidence-based hypotheses, and monitoring the progress of elected interventions (Levine et al., 2017). Considering this, Hatfield and Ogles' (2007) suggestion that behaviorally-oriented clinicians endorse issues of ROM utility less frequently (compared to their insight-oriented counterparts) may be partially accounted for by this orientation's seemingly longstanding emphasis on collecting feedback from clients during treatment.

Although this explanation helps make sense of why issues of utility were rated as less of a barrier to behaviorally-oriented clinicians, it does little to explain why those issues were endorsed more frequently by insight-oriented practitioners. In fact, the impact that psychotherapeutic orientation may have on the implementation of ROM in practice is not well documented within the literature. While the samples used for many ROM studies include practitioners from multiple orientations (Hatfield & Ogles, 2004; Lambert, Harmon, Slade, Whipple, & Hawkins, 2005; Scott & Lewis, 2015), the specific interaction that their orientation may have had on ROM attitudes and adoption overall has yet to be studied quantitatively, with authors often making qualitative inferences from quantitative information (Hatfield & Ogles, 2007).

Although this relationship has yet to be quantitatively investigated, one possible explanation for why insight-oriented therapists tend to view ROM less favorably may be related to ROM being perceived as incongruent with insight-oriented treatment paradigms. Given cognitive behavioral therapy's (CBT) existing utilization of monitoring forms, homework assignment, and other external sources of data collection (Hatfield & Ogles, 2007; Levine et al., 2017), CBT-oriented therapists may show a more favorable perspective on ROM due to a pre-existing familiarity with ROM principles and practices. However, it is possible that this comes at the expense of its generalizability to other orientations, whose practitioners may be less prepared or find it less useful to integrate ROM principles and feedback into their treatment models. Further, insight-oriented therapy's emphasis on the process of therapy (Kazdin, 2000) may disincline insight-oriented psychologists from incorporating ROM into their treatment plans for concerns that ROM may disrupt the organic therapeutic process.

Addressing Challenges

The preceding sections reviewed the literature exploring the potential ways that ROM implementation is associated with positive outcomes in mental healthcare and the factors related to why clinicians elect not to integrate ROM into treatment. What follows is an attempt to address the obstacles using evidence from within the literature. That said, some of the obstacles described have yet to be answered by the literature, and may require a more nuanced approach for further understanding and resolution.

Financial Challenges

As was noted above, the financial cost of frequent administration of outcome measures is a prominent challenge in the way of clinicians implementing ROM into clinical practice (Hatfield & Ogles, 2004; Mours et al., 2009). This is a particularly salient problem for public mental health settings tasked with providing high-quality care with little resources and limited access to outcome measurement tools. Recognizing this, Beidas and colleagues (2015) set out to compile a list of publicly available, psychometrically sound, and brief psychological measures for use with the most prevalent mental health disorders. Their study yielded a list of 49 assessment instruments (29 adult, 20 youth) that can be used for screening, diagnosis, or outcome monitoring with clients experiencing a wide range of symptoms, such as anxiety, depression, disruptive behavior disorders, eating disorders, mania, personality disorders, suicidality, and trauma. Measures of overall mental health were included in their compendium as well (Beidas et al., 2015). Considering that the list was designed around mental disorders with highest prevalence rates, many clinicians likely have one or more patients suffering from symptoms of any of the above. While this does not eliminate the financial burden unilaterally, it does offer the opportunity for clinicians and organizations to implement ROMs with a substantive percentage of clients without incurring the cost of frequent administration.

Personnel Challenges

As noted above, overworked and overscheduled clinicians may still lack the time and resources to administer and interpret measures, generate comparative reports, provide feedback, and implement a tracking system for regular follow-up assessments (Boswell et al., 2013). Beidas and colleagues (2015) attempted to address these concerns by including only measures that are 50 items or less when compiling their list of free outcomes tools.

Researchers have taken steps to address limited time resources by developing automated outcome measurement systems that substantially reduce the amount of time and effort necessary to go from administration to obtaining feedback. One such example is the OQ-Analyst software, which was developed by Michael Lambert and others (2005) using his Outcome Questionnaire-45 (OQ-45). The OQ-Analyst software provides clinicians with weekly changes and according feedback that helps clinicians determine if changes in scale scores represent an improvement, no-change, or deterioration (OQ Measures, 2017). After receiving the completed measure, the OQ-Analyst software generates a dashboard comprised of clinically useful information, including a patient's information, responses to critical measure items, normative comparisons of clinical scale scores, and indices of changes in scores from previous administrations. The latter also includes an alert of current progress, an indication of the likelihood of negative change, and a graphical representation of a patient's scores over time (Lambert et al., 2005). In addition, the developers claim that their software's algorithm has been shown to identify at-risk cases before the onset of a negative outcome with 85-100% accuracy (OQ Measures, 2017). The OQ-Analyst is compatible with any electronic medical record system and depending on the method of administration (i.e., electronically vs. paper and pencil), the assessment can be completed in under 10 minutes and the software can produce all of the information within three to five seconds of obtaining a client's responses (OQ Measures, 2017).

The effectiveness of using the OQ system (OQ Measures, 2017) to measure, monitor, and obtain feedback from clients was demonstrated by four large scale studies overseen by Michael Lambert and colleagues (2005). Their findings showed that among those patients in the sample who were already at elevated risk for negative outcomes, 21% of cases treated by clinicians receiving no feedback on patient progress deteriorated between pretreatment and posttreatment; whereas only 13% of patients whose therapists received feedback from the Outcome Questionnaire-45 experienced similar negative outcomes (Lambert et al., 2005). When the use of a clinical support tool was added, the number of at-risk clients who deteriorated decreased by 8%. A similar pattern was observed when analyzing clients who experienced clinically significant improvements. While 21% of cases treated by therapists who received no feedback showed clinically significant gains, 34% of patients being treated by therapists receiving regular feedback about the progress of clients' symptoms showed similar improvements. When a clinical support tool was incorporated, the number of patients experiencing significant positive change was near 50% (Lambert et al., 2005). Furthermore, the effectiveness of the OQ-Analyst system has been recognized by the Substance Abuse and Mental Health Services Administration (SAMHSA). SAMHSA listed the OQ-Analyst in their National Registry of Evidence-based Programs and Practices (NREPP; SAMHSA, 2014). For clinicians less interested in the entire OQ-Analyst system, the paper and pencil versions of the questionnaires are available for purchase as well.

Ideological Challenges

It was noted that some clinicians believe that ROMs cannot enhance treatment and may put additional strains on clients. Existing support for the widespread utility of ROM in terms of tracking client progress, detecting negative change, and enhancing treatment effectiveness has already been discussed previously in this review. It is also worth noting that research shows that the majority of clients treated using outcome measurement and clinical support tools stay in treatment longer and show greater involvement in their treatment process (Scott & Lewis, 2015; Whipple et al., 2003). With regard to concerns of outcome measure being unable to accurately depict clients in all their complexity, it is recommended that clinicians develop their own battery and administrative protocols that they feel fit best with their preferences, treatment regimen, and conceptualization of the client. Another option may be to implement assessment tools that initially measure a range of symptoms and functioning, followed by more targeted measures as treatment progresses (Scott & Lewis, 2015). However, regardless of the choice both options rely on the clinician to make the best decisions for their clients using clinical judgment. Although this will be described in greater detail in the following section, it should be emphasized that not every client or therapeutic encounter lends itself to integrating ROM. Consequently, it falls to the clinician's clinical judgment to recognize where the use of ROM may be beneficial and where it may be inappropriate.

As was noted in the previous section, clinicians practicing within psychodynamic or humanistic frameworks appear to endorse concerns around the utility of ROM at a higher rate than their behaviorally-oriented counterparts. The literature on the interaction between a clinician's therapeutic orientation and the successful integration of ROM into clinical practice is limited. That said, we hypothesized earlier that the varying levels of concerns with utility may stem from conceptual differences across orientations and ROM's perceived incongruence with an orientation's respective treatment model (Hatfield & Ogles, 2007; Levine et al., 2017). For instance, psychodynamic and humanistic approaches emphasize understanding the subjective experience of clients (Kazdin, 2000), and clinicians practicing within these frameworks may therefore be hesitant to experiment with any practice that has the potential to alter the otherwise organic process between the client and the therapist.

However, there is evidence suggesting that with proper implementation, ROM can enhance therapeutic approaches while simultaneously guarding against common cognitive biases that lead clinicians to overestimate their effectiveness and overlook possible signs of negative change (Eells, 2013). For instance, in his paper on the necessary and sufficient conditions of therapeutic personality change, Carl Rogers (1957) states that among other key factors, therapists must maintain a degree of freedom to be genuinely themselves as well as have unconditional positive regard for the client and their propensity for positive psychotherapeutic change (Rogers, 1957). Although these features were initially rooted within the humanistic approach, they have since been included in the common factors of therapy that have been found to significantly influence treatment outcomes across therapeutic orientations (e.g., humanistic, psychodynamic, cognitive/behavioral; Rosenzweig, 1936; Wampold, 2015; Wampold & Budge, 2012). With that said, one possible natural consequence of a genuine and necessary optimism in clients and their progress is that it leaves clinicians vulnerable to biases where they perceive themselves as more effective or overestimate the improvements in their clients (Eells, 2013). The potential impact of this was quantified in a survey of professionals in 2012, in which 90% of therapists in the sample considered themselves to be in the top quartile of providers with none classifying themselves as below average (Lambert, 2015). However, in a recent study looking directly at trainees' and experienced therapists' ability to accurately identify negative change in clients, therapists only labeled three patients from within the sample as deteriorated by termination, whereas results showed that 40 of the 550 patients from the sample had experienced deterioration as indicated by changes in OQ-45 scores between the start and end of treatment. Moreover, of those three patients who were believed to have deteriorated by clinicians and trainees, only one of them had been correctly identified (Lambert, 2015). In conjunction with support from Eells's (2013), these findings suggest that clinicians tend to overestimate their effectiveness while underestimating the presence of negative changes in their clients.

This paper does not advocate for insight-oriented clinicians (or clinicians practicing any other orientation) to constantly worry about treatment failures, lest they abandon the necessary confidence in themselves and their clients' ability to improve (Rogers, 1957; Rosenzweig, 1936; Wampold, 2015; Wampold & Budge, 2012). Nor does it suggest that therapists hide their true feelings about treatments and thereby sacrifice the genuineness required to effect therapeutic change. Rather, it aims to demonstrate how ROM may support a clinician's ability to maintain a genuine and necessary optimism regarding their clients, irrespective of theoretical orientation of practice. Further, it accomplishes these aims while simultaneously providing a continuous stream of feedback about the therapy and monitoring for warning signs that the patient will deteriorate. ROM draws attention to the ongoing process of the therapy and signals the need for treatment modifications or direct communication regarding the client's experience. As Eells (2013) expressed, "It also allows me to exercise my expertise and freedom as a clinician, knowing that I am receiving corrective feedback the whole way through" (p. 458). This idea compliments findings from Hatfield and Ogles (2007), who found that humanistic and psychodynamic clinicians who were using outcome measures endorsed doing so for reasons related to treatment. While these results are not conclusive, they suggest that ROM may have the capacity for congruence with insight-oriented frameworks and treatments more broadly.

As noted earlier, clinicians should take liberties to select their own measures for use and develop an ROM protocol that is best suited to their circumstances, the complexities of their clients, and the elected treatment (Scott & Lewis, 2015). Considering this recommendation, one possible solution to address the concerns that ROM may alter the therapeutic process could be for clients to complete ROM forms outside of therapy to protect the integrity of the therapeutic session. Furthermore, for clinicians who may believe that ROM specifically denotes outcomes and offers little insight into the process of therapy, one solution may be to use instruments that specifically provide feedback regarding aspects of the therapeutic process (e.g., working alliance, readiness to change, etc.). This is not meant to settle the debate regarding the congruence of ROMs with insight-oriented therapy. Instead, it serves as an informal invitation for more insight-oriented therapists to consider experimenting with ROM to determine if it can enhance their existing treatment practices.

Current Limitations of ROM

Although the previous sections may appear to advocate for the widespread integration of ROM, there are some limitations to ROM's utility that warrant discussion. As was previously mentioned, the list of free and brief measures compiled by Beidas and colleague (2015) aimed to provide clinicians with a list of resources for the most prevalent mental health conditions. However, the authors made note of several areas where there are still needs for assessment tools to be developed. Among these were: diagnosis and treatment monitoring for youths with depressive symptoms, treatment monitoring for disruptive behavior disorders, diagnosis and treatment monitoring for youths with eating disorders, assessment of suicidality in youths, assessment and treatment monitoring for adults with trauma, and assessment of adults with personality disorders other than borderline (Beidas et al., 2015). Similarly, assistive ROM technologies (OQ Measures, 2017) do not yet offer symptom-specific treatment monitoring tools for all disorders. It is worth noting that other measures may be available for use in place of symptom-specific measures and have been linked to superior outcomes compared to treatment as usual (e.g., subjective sense of well-being, treatment satisfaction; Miller et al., 2006). However, these may not be wholly sufficient when a reduction in symptom severity or frequency is central to goal of therapy. As such, the integration of symptom-specific ROM may not be feasible for every patient at this juncture, particularly if they are in a low-resource setting.

Another limitation that warrants consideration is the time that must be committed to using ROM regularly in practice (Boswell et al., 2013; Hatfield & Ogles, 2004; Mours et al., 2009). Despite the compendium of measures offered by Beidas and colleagues (2015), the fact remains that the authors operationalized the term "brief measure" as one that comprises 50 items or less. Given this, a clinician working with a weekly caseload of only 10 clients would potentially need to tabulate the results of 500 items. Moreover, this number could be exponentially bigger if clinicians elect to implement more than one outcome measure to their individual cases. While the previous section posits that one solution to this might be the utilization of assistive ROM technologies that handle the clear majority of the collection and analysis, it should be noted that these software packages are few and far between, and the current cost of access to such technologies is as high as several hundred dollars per year, with additional measures available for an additional purchase (SAMHSA, 2014). Given this, the number of clinicians with the means to access such a tool is limited.

An additional limitation of ROM originates from concerns about the accuracy of clinical judgments. As was earlier stated, obtaining consistent feedback through ROMs has been demonstrated to enhance treatment and be more accurate in predicting negative change compared to clinical judgment alone (Lambert, 2015; Lambert et al., 2005; Miller et al., 2006, 2015). Despite this, it should be stressed that ROM is not meant to take the place of clinical judgement that has been honed through years of experience. Rather, clinicians should use their judgment to decide if ROM is to be implemented, select the appropriate measures for their use, and determine when measures should be administered. Additionally, clinical judgment is crucial in terms of the interpretation of ROM feedback and the actions taken upon receiving it. Just as assessment is one component of case formulation and diagnosis, ROM should be viewed as another information tool to be used in conjunction with clinical experience and qualitative information to yield the best treatment outcomes for clients (Scott & Lewis, 2015).

Future Directions

Future research in the field of ROM should consist of ongoing evaluations of its effectiveness in various settings across patient groups. Future studies should also aim to enhance the utility of ROM by addressing some of its current limitations. For instance, several populations and disorders were mentioned where there is a need for the development and validation of publicly available ROM tools. If ROM is to be widely applicable, future studies should strive to fill the gaps in the ROM toolbox to maximize the number of patients who can benefit. Likewise, clinicians interested in integrating ROM into their practice would benefit from continued efforts to reduce the time needed to administer, score, and interpret ROMs. Thus, future research should work toward developing low-cost ROM assistive software, as a cheaper alternative to what is currently available may allow those working in low-resource mental health settings to overcome the burdens of manual ROM administration and interpretation, and quickly obtain feedback. If nothing else, this may afford some clinicians the opportunity to experiment with ROM and assistive technologies without requiring a large financial commitment.

Apart from these practical issues, perhaps the most crucial area in need of further research is the examination of how clinicians' orientations affect the successful integration of ROM into practice. While some research suggests that clinicians of any orientation can benefit from outcome monitoring (Hatfield & Ogles, 2007), perhaps one reason insight-oriented clinicians endorse concerns about the utility of ROM more frequently than others is due to a lack of research that specifically denotes its efficacy across orientations of treatment. Therefore, it would be beneficial for researchers to reassess if and how the use of ROM (using the definition earlier proposed in this paper) enhances therapy outcomes when implemented by clinicians of various psychotherapeutic orientations. Moreover, such a study should strive to use a control group of clinicians with various orientations and similar years of experiences in clinical practice.

Conclusion

This review examined the history of ROM within the context of contemporary healthcare and underscores the benefits, limitations, and obstacles present in integrating ROM into practice. The review also offers suggestions for possible solutions to common challenges, as well as areas in need of further investigation. This paper aims to make clinicians aware of the benefits of ROM and its supporting research, inspire clinicians to rethink the reasons that they choose to use or not to use ROM in the context of the evidence reported, enlighten practitioners about ROM's flexibility, and serve as an invitation and guide for researchers interested in advancing the integration of ROM in clinical practice.

Every client is unique with individualized experiences, opinions, feelings, beliefs, and troubles. For this reason, every therapeutic venture is varied and nuanced. If this were not the case, the field of psychology would likely not offer specialization in several psychotherapeutic orientations underpinned by psychoanalytic, behavioral, cognitive, humanistic, and holistic principles (American Psychological Association, n.d.; Kazdin, 2000). That is not to say that this myriad of approaches to psychotherapy is a weakness; just as clients are different and nuanced, so must be their options for mental health services. It is the job of the mental health professional to adjust a prescribed treatment to meet the needs of the client. ROM helps in this regard because often, the feedback given can spur conversations about the therapist's choices and allow for constructive analysis about the ongoing process of therapy.

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Perceptions of Barriers Distinguish Young College Students Who Have Higher or Lower Physical Activity Levels

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Limited research has simultaneously examined the perceived and actual circumstances and characteristics that influence young college students' level of physical activity (PA). The current study investigated whether young college students with Health Enhancing (HE) or Minimally Active (MA) levels of PA had different levels of perceived barriers to engaging in PA, self-control, and grit – a quality that helps one to succeed at a goal despite set-backs. A sample of 46 freshmen and sophomores in college completed self-rated versions of a demographic questionnaire, the International Physical Activity Questionnaire, Barriers to Being Active Questionnaire, Short Grit Scale, and Self-Control Scale. Results suggest that participants in the HE group engaged in more vigorous, moderate, and walking PA. The two groups significantly differed in their perception of PA engagement barriers, with the MA group reporting greater obstacles than the HE group. Specifically, the two groups differed in their perceived barriers related to time, injury, social influences, willpower, and resources. No differences were found between the groups' level of grit and self-control. Based on these findings, intervention strategies may be modified according to students' levels of PA and what they perceive as barriers to engaging in PA.

Keywords: barriers, characteristics, college students, physical activity

Regular physical activity (PA) can reduce stress, blood pressure, depression, and cardiovascular disease (Kulavic, Hultquist, & McLester, 2013; Moraska, & Fleshner, 2001) and improve cognitive function (Khan & Hillman, 2014). To promote PA, college students in the U.S. are typically provided campus access to a range of recreational facilities and often need to meet general education requirements for credit in physical education classes (Cardinal, Sorensen, & Cardinal, 2012). Despite these conditions, one-third to one-half of college students lack adequate PA for promotion of health and well-being according to the American College of Sports Medicine and the American Heart Association recommendations (Keating et al., 2005). Following similar guidelines, the National College of Health Risk Behavior Survey (1995) found that 36% of students participated in inadequate amounts of PA. More recently, Chiang and colleagues (2013) found that 46% of U.S. participants had inadequate PA levels. Healthy Campus 2010 noted that inadequate PA was among the top six priority risk behaviors for college populations (Mack, Wilson, Lightheart, Oster, & Gunnell, 2009).

In general, participation in PA tends to decline from childhood to adulthood (Azevedo et al., 2007; Trost et al., 2002) in association with life transitions that bring changes in roles and responsibilities (Telama, Yang, & Viikari, 2005). The transition to college is associated with PA decline (Crozier, Gierc, Locke, & Brawley, 2015). When compared to high school students, 27% less college students engage in regular vigorous PA and 6% less college students engage in regular moderate PA (Douglas et al., 1995; Grunbaum et al., 2004). The most prominent decline in PA among students occurs during the first few years of college but continues to progress after graduation (Calfas, Sallis, Lovato, & Campbell, 1994). This is especially true for women who experience substantial declines in PA during their first year of college (Butler, Black, Blue, & Gretebeck, 2004; Hovell, Mewborn, Randle, & Fowler-Johnson, 1985; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005). Indeed, the progressive PA decline beginning early in college warrants more research investigating this phenomenon and its contributing factors.

Physical Activity Interventions

Early physical activity interventions among young college students have been shown to improve outcome measures that benefit more than PA, including mental health, academic achievement, and social integration (Kahn et al., 2002; Leslie, Fotheringham, Owen, & Veitch, 2000; Michie, Abraham, Whittington, McAteer, & Gupta, 2009; Sallis et al., 1999; Wankel & Berger, 1990). Moreover, early interventions influence PA patterns that establish long-term exercise behaviors and overall health benefits (Fish & Nies, 1996; Sparling & Snow, 2002). Public health strategies typically suggest that changing aspects of the physical environment is the best way to integrate PA into daily routine activities (Buckworth, 2001; Sallis, Bauman, & Pratt, 1998; Seefeldt, Malina, & Clark, 2002) as well as providing services as amenities at each environment (Lombard, Lombard, & Winett, 1995; Marcus et al., 1998; Marcus & Stanton, 1993). A systematic review conducted by Kahn and colleagues (2002) describes environmental and policy interventions (i.e., more access to places for PA combined with informational outreach activities) as one of the most useful ways to enhance PA engagement. Some examples of interventions might include using mass media campaigns to promote PA, providing more college-based health education courses, or implementing family-based social supports (Kahn et al., 2002). To effectively inform environmental and policy decision-making, interventionists should understand what students perceive as barriers to engaging in PA.

From a psychological perspective, there is longstanding evidence that PA engagement is influenced by an individual's level of self-determination (Standage, Duda, & Ntoumanis, 2003; Teixeira, Carraça, Markland, Silva, & Ryan, 2012). Self-determination, the ability to be intrinsically motivated and volitionally make decisions, is a broad and elusive term that has been theorized to foster success with any given goal (Deci & Ryan, 2000). Ultimately, one’s level of self-determination relies on their ability to use self-regulatory strategies (Deci & Ryan, 2000). Although the theory of self-determination and its relationship to PA is well-documented, there is little research on what types of self-regulatory behaviors facilitate PA engagement. Exploring self-regulatory behaviors in conjunction with perceived barriers to PA would allow interventionists to understand what promotes as well as hinders PA engagement. No studies have assessed both self-regulatory characteristics and barriers of circumstances that influence PA with a college population. Strategies for engagement could be further supplemented by understanding how these circumstances and characteristics vary across individuals who participate in different levels of PA. Public health professionals may then be able to modify their strategies according to students’ PA levels.

At this juncture, however, limited research has examined these domains among young college students. Thus, the current study was designed to assess the PA levels of U.S. undergraduates early in their college careers (i.e., freshmen and sophomores) and investigate factors that could distinguish those who have higher or lower levels of PA. The findings uniquely contribute to the field of public health and psychology by exploring psychological correlates of early-aged students’ PA levels and identifying perceived factors that are amenable to change. With this information, public health professionals may be able to improve intervention strategies for PA engagement.

Barriers to Physical Activity Among College Students

Recent research indicates that college students have inadequate PA levels because of physiological, psychological, and environmental barriers (Ramirez-Valez et al., 2015). When examining barriers to PA, Kulavic et al. (2013) emphasized the importance of the individual’s perception of the obstacle. For example, one person may feel that finding the time to exercise is a barrier, and therefore rarely exercises even if they have a similar amount of free time as a peer who exercises daily. The Barriers to Being Active Quiz (BBAQ; U.S. Department of Health and Human Services, 1999) has been used by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services and others to assess perceived barriers to PA. This questionnaire expands the definition of potential barriers to PA engagement and addresses frequently proposed barriers. Using the BBAQ, Ramirez-Valez et al. (2015) found that the most common barriers to PA among Colombian college students were fear of injury, lack of skill, and lack of resources. Conversely, Kulavic et al. (2013) found that the top three barriers to PA among students in the U.S. were lack of time, energy, and willpower. Arzu, Tuzun, and Eker (2006) similarly found lack of time to be the most common barrier among Turkish college students. Unfortunately, it is difficult to judge the accuracy of raters' responses given that the BBAQ is a self-report questionnaire. With regard to the example described earlier, an individual may perceive and rate lack of time as a top barrier but may actually have more time to engage in PA than most people. It may be necessary to understand whether an individual's response is realistic (e.g., perceived lack of time compared to actual available time) before using that information to guide intervention strategies. It is also unclear whether cultural and/or sociodemographic differences explain why certain barriers were perceived as more challenging by the Colombian, Turkish, and U.S. college students. Perhaps, a more granular way of understanding differences in PA could be to examine individual characteristics or psychological traits that vary between students with higher or lower levels of PA.

Self-Regulatory Behaviors and Physical Activity

Studies investigating psychological factors in relation to PA are broad and still within their infancy (Broderson, Steptoe, Williamson, & Wardle, 2005); however, some factors are known to influence PA engagement. Most studies have examined the positive association of self-efficacy and attitudes to exercise with PA participation (Sallis, Prochaska, & Taylor, 2000). Other well-documented research conversely suggests that developmental traits of depression, anxiety, and shyness negatively correlate with PA engagement (Kirkcaldy, Shepard, & Siefen, 2002; Page & Tucker, 1994; Steptoe & Butler, 1996). Yet, when considering these barriers, a better predictor of PA engagement may be related to self-regulatory characteristics, given that these skills are indicative of successful attributes and the ability to overcome hardships (Bandura, 1991; Deci & Ryan, 2000). Theories such as the self-determination theory and self-regulation theory suggest that autonomous self-regulatory skills are one way people achieve goals (Bandura, 1991; Deci & Ryan, 2000). More specifically, a meta-analysis conducted by Teixeira and colleagues (2012) suggested that higher levels of PA are positively related to one's ability to self-regulate. The self-determination theory is based on a continuum of intrinsic motivators that involve self-regulation and can be explored in many different ways regarding PA. For the purpose of modifying intervention strategies, it may be most practical to examine self-regulatory behaviors that include the ability to control impulses (regarding unhealthy behaviors) and achieve long-term goals (regarding exercise plans) despite setbacks. One such regulatory behavior is grit.

Grit and self-control are two self-regulatory characteristics that influence engagement in PA and may help individuals overcome perceived barriers (e.g., Duckworth et al., 2007; Duckworth & Gross, 2014; Reed, 2014). According to Duckworth et al. (2007), grittiness is a quality that helps one to succeed at a task or goal regardless of the domain of performance. Furthermore, Reed (2014) determined that grit is predictive of health enhancing PA levels. An example of this might include someone who has exercised five days a week for the past several years despite being a full-time college student and working at a job for several hours a week. Duckworth and Gross (2014) also suggested that self-control and grit are related but rely on separate determinants of success in a variety of endeavors. Self-control is the process of monitoring thoughts and behaviors to avoid temporary temptations (Fujita, 2011), whereas grit involves long-term persistence and consistency in goals (Duckworth & Gross, 2014). An example of good self-control might include someone who refrains from eating one last donut because they know it is not good for them and might make them feel too full to exercise. Anderson, Wojcik, Winett, and Williams (2006) found that constructs similar to self-control (i.e., self-regulatory behaviors) were positively correlated to PA. Specifically, adults who had higher levels of self-regulation exercised more frequently at moderately intensive rates per week. When compared to other psychological constructs, such as self-efficacy, they did not find the same result. Likewise, Wills, Isasi, Mendoza, and Ainette (2007) found that among adolescents, higher levels of self-control were associated with lower levels of sedentary behaviors. Therefore, self-control may also be important to help college students facilitate and enhance healthy levels of PA. It remains unclear whether the relationships of grit and self-control directly lead to improved levels of PA or if PA is also influenced by confounding variables. Further explorations of the association between PA and psychological characteristics related to self-regulation may help resolve some of these gaps in the literature.

Current Study

The current study aimed to investigate circumstances and characteristics that may influence PA involvement among college students for the purpose of contributing to intervention strategies. Specifically, the author examined early-aged college students' PA levels and whether individuals with higher and lower PA levels were distinguished by actual and perceived physical circumstances (i.e., time, work demands) and psychological characteristics related to self-regulation (i.e., grit, self-control). Previous studies have examined separate components of barriers and characteristics regarding PA, but none have simultaneously analyzed these variables in a population of early-aged college students. It is important to understand barriers and facilitators of PA levels among students early in their college career so that interventions can be implemented throughout students' time spent in college when resources are available. As such, the current study was designed to investigate three objectives, described below.

Hypotheses

The first objective was to determine the PA levels of students early in their college careers. It was hypothesized that the percentage of participants in the highest PA category would be greater than 30% and possibly greater than 50%. These numbers were derived from the notion that college students' PA levels decline throughout college and 33 to 50% of the average population (ranging from freshmen to seniors) have lower than recommended PA levels (Chiang et al., 2013; Keating et al., 2005; Nader, Bradley, Houts, McRitchie, & O'Brien, 2008; National College of Health Risk Behavior Survey, 1995; Telama & Yang, 2000).

The next objective was to examine whether college students with higher and lower PA levels showed differences in barriers to their engagement. It was hypothesized that students with lower PA levels compared to those with higher PA levels would perceive themselves as facing greater barriers to PA engagement. This notion is consistent with previous research (Ramirez-Valez et al., 2015) suggesting that psychological, physiological, and environmental barriers were associated with inadequate levels of PA. Specifically, it was predicted that perceived lack of time would be the primary barrier distinguishing college students with higher levels of PA, as this is consistent with previous research (e.g., Arzu, Tuzun, & Eker, 2006; Kulavic et al., 2013).

The last objective was to examine whether college students with higher and lower PA levels showed marked differences in their levels of grit and/or self-control. It was hypothesized that participants with higher PA levels would have comparatively higher levels of grit, based on findings from Duckworth et al. (2007) and Reed (2014). Based on the findings of Anderson et al. (2006), the author also hypothesized that individuals with higher PA levels would have comparatively higher levels of self-control.

Method

Participants

The current study included 46 participants (men = 10; women = 36) who were recruited in 100-level summer session psychology classes at a mid-sized Eastern U.S. university (see Table 3). Initially, 72 participants took part in the study; however, only 46 participants' data were analyzed. Eight participants were excluded because their ages were above the age criteria (21 years and older) and 18 more were excluded because their International Physical Activity Questionnaire-Short Form (IPAQ) responses failed to meet the IPAQ data cleaning rules. Data cleaning rules recommend excluding unrealistic, missing, or "not sure/don't know" responses. Participants were selected if they fell within the traditional age range for college freshmen and sophomores (18-20 years), and if they provided PA responses that were valid as per the data cleaning rules of the IPAQ (Craig et al., 2003). The sample of college students included

34 freshmen and 12 sophomores. The proportion of men in the current study (22%) was lower than what is typical at the university overall (42%); however, the gender mix reflects the make-up of students who typically enroll in the school's psychology courses. In addition, the proportion of men are comparable to that reported by Crozier et al. (2015) in their study of PA among college students.

Materials and Measures

Demographics. The demographic questionnaire used in the current study included items asking for the participants' age, sex, grade-point average, and weekly time demands (questionnaire is available upon request). There were two weekly time demand items assessing participants' current number of enrolled credit hours and weekly work and/or volunteer hours. Responses to time demand items were added together to create a composite measure of weekly time demands.

International Physical Activity Questionnaire-Short Form. The IPAQ (Craig et al., 2003), a 7-item self-report questionnaire, was used to assess one's PA and inactive behaviors. Six items ask about the frequency, duration, and intensity of PA over the past week and one item asks about sedentary behaviors (i.e., sitting) over the same week. Specifically, items one through six assess the number of days and duration of walking, moderate, and vigorous level activities across a 7-day period and can be used to calculate the respondent's total metabolic equivalent for the week using formulas provided in the IPAQ guidelines (see IPAQ Research Group, 2004).

Participants were classified into one of three PA categories using the coding guidelines (IPAQ Research Committee, 2004): Health Enhancing (HE), Minimally Active (MA), or Inactive. The HE designation is "for people who exceed the minimum public health PA recommendations and are accumulating enough activity for a healthy lifestyle" (IPAQ, Research Committee, 2004, p. 3). This classification requires at least three days of vigorous PA lasting an average of 62 minutes or longer per day or seven days of a combination of walking, moderate, or vigorous-intensity PA. The IPAQ MA classification includes those who are active on at least three days per week but whose duration of activity and intensity fall below the levels needed to enhance one's health. An individual who walks and/or engages in moderate-intensity PA for at least 30 minutes per day, five days per week, meets the requirements for the MA classification. Inactive is the lowest level of PA and these individuals are considered insufficiently active. Test-retest correlation coefficients for the IPAQ range from .66 - .88 (Craig et al., 2003).

The IPAQ categories do not parallel the U.S. Government Physical Activity Guidelines for Americans; however, criteria for the MA level is similar to the U.S. recommended minimum level of aerobic activities for adults (e.g., at least 150 minutes of moderate intensity activity or at least 75 minutes of vigorous activity weekly; Physical Activity Guidelines Advisory Committee, 2008). The HE category is similar to the Physical Activity Guidelines Advisory Committee (2008) recommendations for "extensive health benefits" in adults (e.g., 300 minutes of moderate intensity or 150 minutes of vigorous activity weekly).

Barriers to Being Active Quiz. The BBAQ (U.S. Department of Health and Human Services, 1999), a 21-item self-report scale, was used to assess participants' perceptions of seven typical barriers to being physically active. This instrument uses a 4-point Likert-type scale to assess the extent to which individuals see each barrier statement (e.g., I'm getting older, so exercise can be risky") as true for them (0 = very unlikely; 3 = very likely). The seven perceived barrier subscales are lack of time, social influences, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. Each subscale has three items that were summed for scoring, with a possible range of 0 through 9. A score of 5 or above on any subscale indicated a possible important barrier for the individual to overcome (U.S. Department of Health and Human Services, 1999). Zalewski, Alt, and Arvinen-Barrow (2014) reported an internal consistency alpha value of .92 for the BBAQ full scale and the following alpha values for the seven BBAQ subscales: .85 (lack of time), .67 (social influences), .73 (lack of energy), .85 (lack of willpower), .73 (fear of injury), .67 (lack of skill), and .43 (lack of resources). The current study's internal consistency of the BBAQ full scale was α = .91. Subscales had internal consistency alpha levels of: .72 (lack of time), .54 (social influence), .68 (lack of energy), .87 (lack of willpower), .83 (fear of injury), .74 (lack of skill), and .65 (lack of resources). Reynolds and Livingston (2012) note that reliability coefficients as low as .60 are acceptable for group research; however, measurement experts typically advise caution when using measures with reliability below .70 (e.g., Van Ornum, Dunlap, & Shore, 2008).

Short-Grit Scale. The Short-Grit Scale (Grit-S; Duckworth & Quinn, 2009), an 8-item self-report survey, was used to assess participants' levels of perseverance and passion for long-term goals. Each item (e.g., "setbacks don't discourage me") was rated on a 5-point Likert-type scale (1 = very much like me; 5 = not like me at all). Higher scores indicate greater perceived grit. The Grit-S has been shown to have adequate to good internal consistency (α = .73 - .84) regardless of the domain in which individuals were performing (e.g., completion of first year at West Point, participation in the National Spelling Bee Championship) or whether it's used with children or adults (Duckworth & Quinn, 2009). Current study internal consistency for the Grit-S was α = .77, which is acceptable for group research (Reynolds & Livingston, 2012) and sufficiently high to indicate scale reliability (Van Ornum, Dunlap, & Shore, 2008).

Self-Control Scale. The Self-Control Scale (Tangney, Baumeister, & Boone, 2004), a 36-item self-report measure, was used to assess one's sense of overall control over thoughts, emotion, impulse, performance regulation, and habits. Each item (e.g., "I have trouble saying no") uses a 5-point Likert-type scale (e.g., 1 = not at all like me; 5 = very much like me). In prior research, the internal consistency ranged from α = .83 - .85 (Tangney et al., 2004). The current study internal consistency was α = .90.

Procedure

Recruitment took place after approval was obtained from the university's Institutional Review Board. Professors of psychology courses at the university were contacted via email to determine if their students could be recruited during class. Potential participants first heard a short description of the study during class. Then, if they agreed to participate, they signed an informed consent and took questionnaire materials to be completed on their own and returned the next class day. The questionnaires were compiled in the following order: Demographics; Grit-S; BBAQ; IPAQ; Self-Control Scale. Completing the materials took approximately 15-20 minutes. Some participants received extra credit for their classes at the professors' discretion.

Table 1
Demographics for all Participants and those in the MA and HE groups

Measure	All participants (*n* = 46)	MA (*n* = 19)	HE (*n* = 27)
Age *M (SD)*	18.37 (.68)	18.21 (.42)	18.48 (.81)
Grade point average *M (SD)*	3.04 (.50)	2.95 (.57)	3.11 (.45)
Time demands[a] *M (SD)*	24.60 (15.22)	21.03 (11.17)	27.21 (17.35)
Average sleep hours per night *M (SD)*	6.63 (1.04)	6.58 (1.25)	6.67 (.88)
Physical activity days[b] *M (SD)*	3.02 (1.96)	2.11 (1.66)	3.67 (1.92)
Convenience of working out rating *M (SD)*	2.83 (.77)	2.58 (.84)	3.00 (.68)
School days missed in prior semester *M (SD)*	3.35 (5.86)	3.15 (4.31)	3.48 (6.82)

Note: [a]This measure is derived from the total of the students' self-reported credit hours load for the semester, average work hours and/or volunteer hours per week, and average hours spent on out of class study and course work per week. [b]Participant's report of the number of days during the past seven on which he/she engaged in strenuous PA.

Results

Prior to testing the specific hypotheses, preliminary independent samples t-tests were run to investigate possible differences between participants who met inclusion criteria (*n* = 46) and who did not meet inclusion criteria for the IPAQ (*n* = 18). This

Table 2

MANOVA Results for Physical Activity per Intensity Type and Group

Physical activity[a]	Total ($n = 46$)	HE ($n = 27$)	MA ($n = 27$)	F	p	np^2
Walking						
M (SD) days out of last 7	5.72 (2.05)	6.33 (1.52)	4.84 (2.41)	6.63	.013	.131
% w/ ≥30 mins on ≥3 days	91	96	84			
Moderate						
M (SD) days out of last 7	2.64 (2.48)	3.65 (2.58)	1.21 (1.44)	13.88	.001	.240
% w/ ≥30 mins on ≥3 days	47	67	16			
Vigorous						
M (SD) days out of last 7	1.88 (1.85)	2.76 (1.83)	.63 (.96)	21.34	<.001	.327
% w/ ≥30 mins on ≥3 days	35	56	5			

Note: [a]PA results are based on participants' IPAQ responses. Participants reported the number of days out of the last seven on which they participated in each of the three intensity levels of activity and the usual duration of their activity.

analysis used demographics (e.g., age, grade point average, weekly time demands) and all study measures except those derived from the IPAQ. The t-test results were non-significant (a summary of these results can be requested from the author). Data from current study participants were previously analyzed as part of a larger, unpublished study of college students' PA behaviors (Finley & Giles, 2015). All assumptions were met prior to conducting the following analyses.

Physical Activity of College Students

Of the participants ($n = 46$) who could be classified into PA groups using the IPAQ guidelines (Craig et al., 2003), 41% ($n = 19$; men = 2, women = 17) and 59% (n = 27; men = 8, women = 19) fit the criteria for the MA and HE categories respectively, while none fell into the inactive category. No significant differences ($p < .05$) were found between PA groups regarding items from the demographic questionnaire (see Table 1). Participants' reports on the IPAQ were used to determine the number of days out of the past seven during which each participant engaged in at least 30 minutes of walking, moderate, or vigorous PA.

To examine group differences between students' levels of PA, a multivariance analysis of variance (MANOVA) was conducted. The results indicated a main effect of significant difference between the conditions, Wilk's Lambda = .487, $F(3, 42) = 14.77$, $p < .001$, $\eta p^2 = .51$ (see Table 2). Follow-up univariate analyses indicated that the HE group ($M = 2.76$, $SD = 1.83$) spent significantly more days than the MA group ($M = 0.63$, $SD = 0.96$) engaging in vigorous PA, $F(1, 44) = 21.34$, p < .001, $\eta p^2 = .33$. The HE group ($M= 3.65$, $SD = 2.58$) also spent significantly more days than the MA group ($M = 1.21$, $SD = 1.44$) engaging in moderate PA, $F(1, 44) = 13.88$, $p = .001$, $\eta p^2 = .24$. Similarly, the HE group ($M = 6.33$, $SD = 1.52$) spent significantly more days than the MA group ($M = 4.84$, $SD = 2.41$) engaging in walking PA, $F(1, 44) = 6.63$, $p = .013$, $\eta p^2 = .13$. The IPAQ data was also used to determine the percent of participants who engaged in at least 30 minutes of each intensity of activity for at least three days per week. The percentage results showed that the vast majority of participants (91%), regardless of group, walked for at least 30 minutes on three or more days during the last seven days (see Table 2). Although the HE participants were more likely than the MA participants to be physically active, an independent samples t-test analysis did not reveal significant differences in hours of estimated sitting on a weekday between the HE ($M = 5.96$, $SD = 2.76$) and MA group ($M = 6.88$, $SD = 2.83$), $t(39) = 1.05$, $p = .302$.

Table 3

MANOVA Results for BBAQ by Subscale and Group

BBAQ Scale	Total (*n* = 46)	HE (*n* = 27)	MA (*n* = 27)	*F*	*p*	np^2
Lack of time						
M (SD) total subscale score	3.72 (2.33)	2.93 (1.88)	4.84 (2.48)	8.90	.005	.168
Important barrier	37%	19%	63%			
Social influences						
M (SD) total subscale score	3.09 (2.07)	2.56 (1.95)	3.84 (2.06)	4.64	.037	.095
Important barrier	22%	11%	37%			
Lack of energy						
M (SD) total subscale score	4.30 (2.37)	3.70 (2.40)	5.16 (2.09)	4.55	.039	.04
Important barrier	48%	33%	68%			
Lack of willpower						
M (SD) total subscale score	4.59 (2.90)	3.48 (2.95)	6.16 (1.98)	11.82	.001	.212
Important barrier	54%	37%	79%			
Fear of injury						
M (SD) total subscale score	.80 (1.33)	.44 (.85)	1.32 (1.70)	5.26	.027	.107
Important barrier	4%	0%	11%			
Lack of skill						
M (SD) total subscale score	1.71 (2.21)	1.15 (1.66)	2.50 (2.66)	4.51	.039	.093
Important barrier	15%	7%	23%			
Lack of resources						
M (SD) total subscale score	1.97 (2.10)	1.85 (1.39)	3.11 (2.45)	11.46	.002	.207
Important barrier	13%	0%	32%			

Note: *Mean (SD)* based on the total possible score for the three items per subscale (total range = 0 – 9). Important barrier indicates the percent of participants who had a subscale total score of >5, which, according to BBAQ scoring guidelines, indicates an important barrier to PA for the individual (U.S. Department of Health and Human Services, 1999).

Comparison of Barriers by Physical Activity Group

To examine group differences between students' BBAQ results, a MANOVA was conducted. As hypothesized, there was a main effect of significant difference between the HE and MA groups, Wilk's Lambda = .693, $F(7, 38) = 2.408$, $p = .038$, $\eta p^2 = .307$ (see Table 3 and Figure 1). Follow-up univariate analyses indicated that all of the barriers were significantly different between groups ($p < .05$). The three barriers that most significantly distinguished the groups were as follows, respectively: lack of willpower was significantly greater in the MA group ($M = 6.16$, $SD = 1.98$) than the HE group ($M = 3.48$, $SD = 2.95$), $F(1, 44) = 11.82$, $p = .001$, $\eta p^2 = .212$; lack of resources was significantly greater in the MA group ($M = 3.11$, $SD = 2.45$) than the HE group ($M = 1.85$, $SD = 1.39$), $F(1, 44) = 11.46$, $p = .002$, $\eta p^2 = .207$; lack of time was significantly greater in the MA group ($M = 4.84$, $SD = 2.48$) than the HE group ($M = 2.93$, $SD = 1.88$), $F(1, 44) = 8.90$, $p = .005$, $\eta p^2 = .168$. Moreover, the results show that the three most important barriers, overall and per PA group, were lack of willpower ($M = 4.59$, $SD = 2.90$), energy ($M = 4.30$, $SD = 2.37$), and time ($M = 3.72$, $SD = 2.33$). Lack of skill was also significantly greater in the MA group than the HE group, $F(1, 44) = 4.51$, $p = .039$, $\eta p^2 = .093$, as was lack of social influences, $F(1, 44) = 4.64$, $p = .037$, $\eta p^2 = .095$.

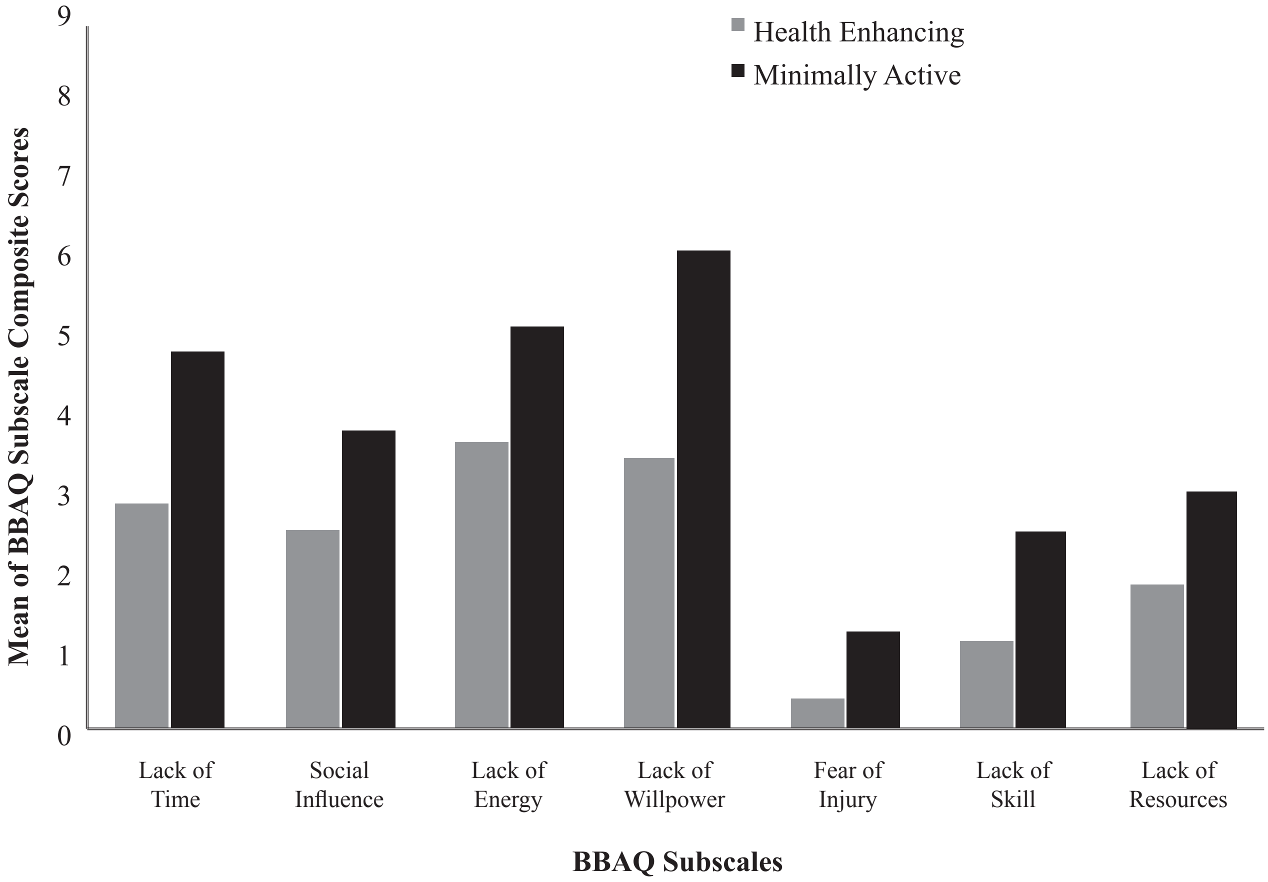

Figure 1. This figure displays the mean barriers' subscales results for MA and HE groups. All of the barriers were significantly different between groups ($p < .05$). The three barriers that most significantly distinguished the groups were lack of willpower, resources, and time.

To assess whether the groups differed in regard to actual limited time rather than perceived limited time, an independent samples t-test was conducted for possible group differences in the composite measure of the time demands participants face (the sum of credit hours and work and volunteer hours per week). No significant differences were found between the HE group ($M = 27.21$, $SD = 17.35$) and MA group ($M = 21.03$, $SD = 11.17$), $t(45) = -1.36$, $p = .181$.

Comparison of Self-control and Grit by Physical Activity Group

An independent samples t-test was conducted to evaluate the hypothesis that individuals in the HE group would have higher levels of self-control and grit than those in the MA group. Contrary to the hypothesis, there was no significant difference in the level of self-control between the HE ($M = 3.28$, $SD = .45$) and MA ($M = 3.18$, $SD = .54$) group, $t(45) = -.698$, $p = .489$. Likewise, there was no significant difference in the level of grit between the HE ($M = 3.35$, $SD = .63$) and MA ($M = 3.24$, $SD = .67$) group, $t(45) = -.618$, $p = .539$.

Discussion

Three questions were addressed in the current study regarding participants' levels of PA. The first question addressed the PA levels of U.S. students early in their college careers. As expected, more than half of the participants (53%) reported PA levels needed to derive health and wellbeing benefits, falling into the HE category. Furthermore, the proportion of young college students who met criteria for the HE category from the complete sample, prior to excluding participants (*n* = 72), remained above 40% and well within the range indicated in the meta-analysis investigation by Keating et al. (2005).

Most students in the current study, regardless of their PA group, engaged in walking on a regular basis and both groups averaged over six days per week on which they walked at least 30 minutes. Those in the MA group were less likely than those in the HE group to engage in more physically demanding and health-benefiting activities. The amount of walking across groups is perhaps explained by the campus layout in which the data was collected. The layout requires students to spend a great deal of time walking to various classroom buildings and from their residences or parking spaces to campus. The amount of walking needed to navigate the campus also may explain why there were no participants who fit the criteria for the inactive IPAQ classification. An additional explanation for the lack of participants in this category may have been the exclusion of those who failed to adequately complete the IPAQ (n = 18) and were eliminated due to the data cleaning rules. For example, those who have the lowest levels of PA may be less aware of the amount of PA in which they engage — hence provided “I don’t know” responses or left some IPAQ items blank — either of which meant that their results were dropped from analysis, according to the IPAQ guidelines.

The second question addressed whether college students with higher and lower levels of PA were distinguished by factors they perceived as barriers to their engagement. As expected, group differences in overall levels of PA appear to be explained by students’ perceptions of barriers regarding social influences and injuries, and lack of willpower, resources, time, and skill. The more difficult interpretation, however, is understanding why individuals with lower levels of PA perceive these as barriers to engagement. For instance, it is difficult to posit whether fear of injury hinders PA engagement or whether students who have less PA engagement are more prone to injuries given their increased risk for health problems, thereby elevating their subscale scores on the BBAQ. However, findings that are more difficult to interpret include the differences in lack of skills and social influences between groups. For example, differences in lack of skills could be explained by higher PA levels being associated with students who participated in competitive sports at a young age and were, in turn, more likely to have higher preexisting levels of PA. Social influence differences could be explained by students forming social groups related to their engagement of PA and are, therefore, less likely to engage in PA. However, differences in lack of resources supports the notion that such barriers are most likely perceived unrealistically given that students were provided similar resources (i.e., recreational facilities and physical education requirements). Perhaps, the most supportive finding in regard to that argument was that the MA group yielded significantly more limitations of time, yet the composite measure of real-life time demands experienced by students indicated that those with MA PA levels actually had less demands on their time than those with HE PA levels, as this relationship approached statistical significance. These findings were consistent with the Kulavic et al. (2013) study that compared perceived PA barriers of traditional to non-traditional college students. In the current study, lack of time was ranked as one of the highest perceived barriers as evident by 57% in the MA group and 17% in the HE group reporting lack of time as a barrier to physical activity. But studies like Kulavic et al. (2013) never measured actual time differences between their participants. The discrepancy between students’ perceived barriers versus their actual observed physical barriers brings into question whether something psychologically or intrinsically differentiated the two groups. The significant difference between groups regarding lack of willpower partly suggests that psychological characteristics could be a distinguishable trait responsible for other perceived barriers.

In regard to the third question, college students with higher and lower levels of PA were neither distinguished by their levels of grit or self-control. Findings from this study were contrary to their hypothesis and to prior research suggesting that grit (Duckworth et al., 2007; Reed, 2014) and self-control (Anderson et al., 2006) would distinguish those with higher and lower levels of PA. This result is also surprising as the willpower subscale of the BBAQ distinguished the groups. It may be that the items on the grit and self-control measures do not capture behaviors relevant to PA as well as the willpower items on the BBAQ. However, that does not explain the inconsistency with other studies suggesting that grit and self-control are associated with PA engagement. Perhaps, there may be something unique to young college students that influenced these findings which were not captured in the current study. There are also many types of self-regulatory behaviors that could influence PA engagement, which are assessed differently, depending on the study. Theories suggest self-regulatory skills are used as a way of improving motivation and determination (Bandura, 1991; Deci & Ryan, 2000), and these ultimately foster PA engagement (Teixeira, Carraça, Markland, Silva, & Ryan, 2012). It could be that willpower is a result of high self-regulation and is therefore more likely to influence one's self-determination than behaviors like grit and self-control. The current study findings are unique and should be further explored in relation to theories like the self-determination theory or self-regulation theory.

How can researchers use this information to guide intervention techniques? While a comprehensive review of PA intervention strategies was beyond the scope of this article, other studies (e.g., Michie et al., 2009) provide more in-depth reviews. An important strategy to begin with for improving PA of those with MA PA levels could be to teach time management skills, considering lack of time was perceived to be the most significant barrier. To address the barrier of social influences, clinicians could use social media to support PA engagement for students regardless of whether students have physically engaged social groups. Approximately 31% of teenagers and young adults use the internet to get health, dieting, or physical fitness information (Lenhart, Purcell, Smith, & Zickuhr, 2010). Campus bloggers could use social media posts to encourage more engagement in PA among college students by writing about students competing in local events, such as seasonal/holiday sporting activities or 5K runs. Additionally, social media programs could address lack of resource barriers by including locations of nearby resources for a variety of physical activities (e.g., gyms, hiking trails, and yoga clubs). Moreover, posters and flyers could be displayed around campus to inform students how much PA they engage in by walking around campus. Specifically, it is recommended that the posters or flyers provide the distance between campus locations as well as the number of extracted calories associated with walking that distance. For example, a poster or flyer could state something as simple as, "congratulations, you have walked one mile if you are coming from the library, which means you have burned nearly 100 calories." This is a simple, yet, effective way to inform students about the importance of engaging in walking exercises around campus and will hopefully improve lack of willpower. All of the previously mentioned intervention strategies should be designed accordingly with students' different levels of PA. Although the current study does not provide an exhaustive list of recommendations for young college students, the barriers addressed should be taken with serious implications for future research and can be used as a framework for more strategy development.

Limitations

While this study adds to the literature on PA levels of college students and their perceived barriers to PA, it is not without limitations. The sample size was small which restricted obtaining data from men and individuals from different geographic locations. Thus, this may not be representative of all younger-aged college students across the U.S. Additionally, all participants were selected from psychology classes and may not be representative of students in other majors. It could be that other classes, like kinesiology-based courses, attract more physically active students. Furthermore, all questionnaires were self-report and addressed topics that may be sensitive for individuals to report honestly. As such, self-report measures may not be the most accurate way to measure PA levels. More specifically, it is unclear why certain subscales on the BBAQ, such as social influences, yielded lower reliability coefficients than others. Subscales with reliability coefficients lower than .70 should be interpreted with caution (Van Ornum, Dunlap, & Shore, 2008).

Future Research

In light of the current study's limitations, it is suggested to compile larger sample sizes and gather data from diverse geographic locations and class subjects. Future research should continue to focus on the motivators and perceived barriers to college students' engagement in PA, specifically regarding time, resources, social influences, and willpower. More intervention strategies for underclassmen should be explored given the sparsity of research and the high prevalence of inadequate PA levels. To gather accurate levels of PA, researchers could administer both self-report and informant-report (e.g., parents, caregivers, siblings) questionnaires. Perhaps, the best way to obtain accurate PA levels would be to administer a tracking device measuring PA components (i.e., heart rate, steps per day, calories, etc.), such as a Fitbit, and analyze that data with respect to psychological factors/barriers. It is also suggested that an item analysis be conducted for future use of the BBAQ to assess the quality of items within the subscales that have low reliability coefficients.

Conclusion

Young college students and college students in general face adverse health effects due to their sedentary lifestyle and inadequate levels of PA (Bray et al., 2004; Ramirez-Valez et al., 2014). Determining what motivates and prevents students from engaging in health promoting levels of PA is essential to increasing PA in a university setting. The findings demonstrate that young college students who have lower levels of PA perceived comparatively greater barriers related to social influences, time, willpower, and resources. Such barriers may be actual physical limitations or merely perceived limitations but should be taken into consideration when developing intervention strategies to promote healthier levels of PA among young college students. Overall, the current study expands the literature on PA levels among students early in their college careers. Specifically, the current study specifies the perceived barriers associated with individuals engaging in less PA than their peers and provides suggested interventions and research assistance.

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Is the Glass Always Half Full? Examining the Relationship Between Dispositional Optimism and Risky Decision Making

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Dispositional optimism is considered a stable personality trait and as such may influence expectations about outcomes in a variety of decision-making scenarios. The current study assessed the relationship between dispositional optimism and decision-making behavior when risk is present. To investigate whether optimism was associated with risky decision-making behavior, we examined the relationships between dispositional optimism and two correlates (attributional style and trait hope) and risk-taking behavior on the Iowa Gambling Task (IGT) for 61 participants (M_{age} = 19.62). Correlational analyses between the three measures of optimism and IGT performance indicate that dispositional optimism and risky decision-making behavior are not significantly related to one another. This study contributes to the literature examining how individual differences influence decision-making. A broader perspective on the factors that influence decision making is necessary so that the mechanisms that predict and explain risky decision making can be better understood.

Keywords: dispositional optimism, decision making, risk, attributional style, hope, Iowa Gambling Task

The construct of optimism can be measured as a stable personality trait (dispositional optimism), or as an emotional judgement that is context-specific (situational optimism). Dispositional optimism is defined as a "stable personality trait characterized by general positive expectations that influence motivated action" (Zagorski, 2013, p. 607), implying that it is a fixed trait that has a pervasive influence in the decision-making process. The current project focuses on dispositional optimism rather than situational optimism because previous work examining the relationship between situational optimism and decision making suggests that situational optimism consistently acts as a bias in the decision-making process (Bracha & Brown, 2012; Moen & Rundmo, 2005). Since decision making affects many domains of life and is influenced by a variety of factors, it is important to examine which factors promote positive decision making and which factors contribute to disadvantageous or risky decision-making behavior. The purpose of the current study is to examine the influence of dispositional optimism on decision-making behavior to determine whether it is a factor that significantly influences decision making in situations where risk is present.

Optimism

Dispositional optimism is considered to be a stable personality trait (Carver, Scheier, & Segerstrom, 2010; Felton, Gibson, & Sanbonmatsu, 2003); therefore, its effect on beliefs about future events may influence decisions regarding a variety of life domains. Dispositional optimism has been studied across a variety of fields. Studies relating dispositional optimism to physical health and psychological well-being show that more optimistic people report fewer illnesses (Scheier & Carver, 1985), recover more quickly from surgery (Scheier et al., 1989), and know more about health-related risk factors (Radcliffe & Klein, 2002). Additionally, optimists tend to use problem-focused coping strategies (Aspinwall & Taylor, 1992; Büyükaşik-Colak, Gündoğdu-Aktürk, & Bozo, 2012), and therefore experience smoother transitions after major life changes, such as the transition to college (Aspinwall & Taylor, 1992). In the field of economics, research finds that optimism affects individuals' decisions about their career. People who are more optimistic tend to work more hours, are more likely to be self-employed, and are less likely to retire (Puri & Robinson, 2005). Optimistic males are more likely to make risky investments than pessimistic male peers and all female peers (Felton et al., 2003). Overall, those higher in dispositional optimism report being more satisfied with life (Radcliffe & Klein, 2002), suggesting that dispositional optimism has a ubiquitous influence.

Research also shows that individuals who report higher levels of dispositional optimism are more likely to anticipate positive outcomes in the face of obstacles (Zagorski, 2013), leading them to enhance their efforts toward achieving their goal. The process underlying the motivational differences between those who report low versus high levels of dispositional optimism is thought to be the result of expected outcomes. More optimistic people expect positive outcomes and therefore continue to exert effort in pursuit of a goal, whereas less optimistic people may not expect a positive outcome and therefore disengage effort more quickly (Carver & Scheier, 2014). These same processes may also be at play in decision-making situations where the outcome is ambiguous or uncertain: optimistic people may be more likely to expect a positive outcome, and therefore will be more likely to make disadvantageous decisions than realists or pessimists. Goal-directed, motivational effects of dispositional optimism are supported by studies finding that students with high levels of dispositional optimism are more likely to complete college (Solberg Nes, Evans, & Segerstrom, 2009) and have higher salaries a decade after graduation (Segerstrom, 2007), suggesting enhanced effort in pursuit of goals.

Dispositional optimism is a well-studied construct that can be reliably measured (e.g., Scheier, Carver, & Bridges, 1994). It is most commonly measured as a bidimensional trait (e.g., the Life Orientation Test – Revised [LOT-R]; Scheier et al., 1994). Rather than being viewed on a single continuum, it allows individuals to report simultaneous optimism and pessimism. This is done because people can exhibit a healthy and adaptive amount of both traits. A certain amount of optimism may serve as a motivational tool, while some pessimism may make a person more realistic or less likely to be disappointed when outcomes are not favorable (Herzberg, Glaesmer, & Hoyer, 2006).

Attributional Style

Attributional style is a construct that has been related to optimism because it may foster an optimistic perspective that can influence decision-making behavior (Todesco & Hillman, 1999). Individuals may attribute event causality to either internal or external sources that are either stable (long-lasting) or unstable (only relevant to the specific instance; Peterson et al., 1982). When defining attributional styles, optimistic individuals are described as making external unstable attributions toward negative events (Scheier & Carver, 1993), which culminates in the belief that the cause of the negative event was out of their control and therefore will not continue to affect them. Pessimistic individuals, on the other hand, are described as making internal attributions toward negative events, which contribute to the belief that the cause of negative events is their fault. Pessimistic individuals are also more likely to view causes as stable (Scheier & Carver, 1993), leading them to feel as if they are unable to change or stop negative events from occurring.

Attributional style may partially explain a propensity for optimistic individuals to make riskier decisions. Since an optimistic attributional style includes a belief that negative events are beyond the control of the individual, optimists may be less likely to view a disadvantageous outcome as being under their personal control, but rather as the result of something that was beyond their control (Scheier & Carver, 1993). They may attribute negative outcomes to external causes rather than the result of a decision they made, making them less responsible for the event. In this way, attributional style may work in conjunction with optimism to influence decision-making behavior.

Trait Hope

Optimism is colloquially used to describe hopefulness about the future in general or a future event, and in this way may be influenced by the presence of hope as a personality trait. Dispositional optimism (measured by the LOT-R; Scheier et al., 1994) and hopefulness have been shown to be correlated (Carifio & Rhodes, 2002). Therefore, the presence of hope may influence decision-making habits in situations with ambiguous outcomes. To study hopefulness, Snyder and colleagues developed the Hope Scale (called the Future Scale when being administered), which defines hope as the "overall perception that one's goals can be met" (Snyder et al., 1994, p. 2) or a "cognitive set that is based on a reciprocally derived sense of successful (a) agency (goal-directed determination) and (b) pathways (planning of ways to meet goals)" (Snyder et al., 1991, p. 571), thereby making hope similar to optimism in that it acts as a motivator in the decision-making process. When measuring hope using the Hope Scale (Snyder et al., 1991), goal-directed behavior is examined in two ways, namely agency and pathways. Agency refers to the motivation that drives behaviors, while pathways refer to one's ability to conceptualize different ways to achieve a goal; both are necessary components in behavior (Snyder, 1994). Given that there is a relationship between dispositional optimism and hope (Carifio & Rhodes, 2002), it is possible that those who are more optimistic may differ from those who are more pessimistic in both agency and pathways thinking, which in turn may influence decision-making behavior.

Decision Making

Previous research examining factors that affect decision making has shown that sense of power, sensation seeking, and education level all influence an individual's willingness to take risks when making decisions. For example, Anderson and Galinsky (2006) found that a sense of power, or the feeling that one possesses the ability to influence others, increases the likelihood that someone will make a risky decision. They suggest that when individuals feel they have power, they pay more attention to reward-laden information, leading them to ignore the potential for loss. In addition, a study of individuals who were identified as sensation-seekers (aged 20-57 years) found that they were more likely to make risky decisions because it satisfies their need for sensation (Moen & Rundmo, 2005). Maladaptive levels of optimism may be problematic when people are presented with decisions that can significantly impact their life or cause them harm, such as gambling or sexual risk taking. For example, Sullivan, Drake, and Sanchez (2007) found situational optimism to be related to careless drug use and sexual activity. Researchers have also found that optimists expect more positive outcomes when gambling (even in populations without gambling problems; Gibson & Sanbonmatsu, 2004) and therefore may continue to gamble even after repeated losses. Additionally, when imagining future events, people with higher levels of dispositional optimism are more likely to focus on the possible positive outcomes rather than on possible negative outcomes (Sharot. Riccardi, Raio, Phelps, 2007). Education level, however, is inversely correlated to risky decision-making, perhaps because higher education increases expertise and familiarity with a subject and its associated risks (Moen & Rundmo, 2005).

Dispositional optimism and decision making are thought to be related through motivational processes; goals motivate behavior based on how optimistic a person is about the likelihood that the desired outcome will occur (Carver & Scheier, 2014). Additionally, when imagining future events, people with higher levels of dispositional optimism are more likely to focus on the possible positive outcomes rather than on possible negative outcomes (Sharot, Riccardi, Raio, & Phelps, 2007). Collectively, these findings suggest that individuals who are unrealistically optimistic about the outcomes of their actions may be less inhibited by the risk or possibility of loss when making a decision. The variation in individuals' levels of dispositional optimism may create a situation in which the propensity to make risky or disadvantageous decisions is higher for certain individuals.

The Current Study

Decision making has been defined as the "behavioral manifestation of executive cognitive ability" (Barry & Petry, 2008, p. 244) and therefore may be susceptible to influence from personality traits such as dispositional optimism. Existing research has explored the relationships between situational optimism and risky decision making in sexual and drug-related scenarios (Sullivan et al., 2007) as well as dispositional optimism and medical treatment-related decision making (such as in men diagnosed with prostate cancer (Orom et al., 2009; Steginga & Occhipinti, 2006). The current study expands this body of work by examining the relationship between dispositional optimism and decision-making behaviors where risk for loss is present.

The construct of dispositional optimism was measured through three perspectives: dispositional optimism, attributional style, and trait hope. The Iowa Gambling Task (IGT) measures one's sensitivity to reward and loss and is used to measure decision-making tendencies in participants. Based on the research summarized above, the researchers expected that people who are more optimistic will be more likely to make disadvantageous decisions because their optimism leads them to incorrectly assess the probability of achieving a favorable outcome. Thus it is hypothesized that dispositional optimism and two closely related constructs, attributional style and trait hope, will be positively correlated with risky or disadvantageous decision making.

Method

Participants

Sixty-one individuals with a mean age of 19.62 years (ranging from 17 to 30; *SD* = 2.03) participated in the study. Forty-four (72.1%) were female, 16 (26.2%) were male, and one (1.6%) participant did not report a gender. Participants were recruited at an urban university in the New York City area through flyers posted around campus as well as an online posting. When participants reported their ethnicity, 42 (68.9%) identified as White, five (8.2%) as Asian, four (6.6%) as Black/African-American, three (4.9%) as Hispanic or Latino, and six (9.8%) as more than one ethnicity, with one participant (1.6%) who did not report ethnicity.. Participants had completed between 12 and 17 years of formal education (*M* = 13.36, *SD* = 1.33) at the time of the study. When asked what language they speak most often, 58 (95.08%) participants reported English, one participant reported Italian (1.64%), and two participants did not report a language (3.28%).

Materials

The Iowa Gambling Task. A commonly used method of assessing risk-taking behavior as well as sensitivity to reward and loss is the Iowa Gambling Task (IGT; Bechara, Damasio, Damasio, & Anderson, 1994). The IGT was designed to imitate real-world decision making in research settings and is commonly used in research as a behavioral measure of risky decision making (Buelow & Suhr, 2009). It is known to be both reliable and valid as a measure of decision-making behavior (Burdick, Roy, & Raver, 2013; Brevers, Bechara, Cleeremans, & Noël, 2013). It was chosen as the measure of risky decision making because performance on the IGT is thought to reflect the coordination of emotion and cognition (Bechara, Damasio, Tranel, & Damasio, 2005; Wood, Busemeyer, Koling, Cox, & Davis, 2005) rather than one over the other. As a task that employs both emotional and cognitive processes to guide decision making, the IGT is well-suited to the goal of this study to examine the relationship between optimism and decision-making behavior.

Participants completed a computerized version of this task in which they were given $2,000 to start, and were asked to collect as much imaginary money as possible over the course of 100 trials. During each trial, participants were presented with four decks of cards face down (labeled decks A, B, C, and D) and were asked to select one deck per trial. Each deck has a different reward to loss ratio: decks A and B are advantageous in the short term, but disadvantageous in the long term (i.e., larger gains but also larger losses), while decks C and D are less advantageous in the short term but overall are more advantageous in the long term (i.e., smaller gains but also smaller losses; Buelow & Suhr, 2009). After each selection, participants were shown the resulting financial gain or loss, and were able to see the total amount of imaginary money remaining in the corner of the screen throughout the task. Participants displaying healthy decision-making behavior are expected to detect the gain/loss pattern as they progress through the 100 trials, leading them to select cards from the decks that are more advantageous in the long term (decks C and D) most often, especially towards the end of the 100 trials (Sweitzer, Allen, & Kaut, 2008).

The Life Orientation Test. The Life Orientation Test – Revised (LOT-R; Scheier et al., 1994) is a frequently used measure of optimism. The LOT-R has been shown to have high reliability (Cronbach's α = .83 for the 6 items in this study). Participants responded to statements on a 5-point Likert scale with 1 representing strongly disagree and 5 representing strongly agree. Example items include: “I’m always optimistic about my future” and “I hardly ever expect things to go my way.” LOT-R optimism and LOT-R pessimism scores were calculated for each participant based on the three questions that correspond to each subscale (as defined by Herzberg et al., 2006), with higher scores indicating higher levels of each trait.

The Attributional Style Questionnaire. The Attributional Style Questionnaire (ASQ; Dykema, Bergbower, Doctora, & Peterson 1996) is a 24-item scale designed to assess a person’s explanatory style and has been shown to be reliable (α = .93 in the current study). The scale assesses whether participants are more likely to endorse internal or external representations of negative events. The ASQ also measures the participants’ belief that the cause of the negative event is stable (therefore long lasting) or unstable (relevant only to the specific instance being examined). Participants were asked to imagine situations and then rate on a 7-point Likert scale (a) how likely it is that the situation will continue to affect them and (b) if the cause of the situation is something that would only affect the specific occurrence or other areas of their life as well. Sample events include “you have trouble sleeping” and “you can’t find a job.” A rating of 1 represents “will never affect you/just affects this event” and 7 represents “will always affect you/affects all other areas.” The ASQ resulted in two scores for each participant – (a) a stability subscore and (b) a globality subscore. Mean score was calculated for both of the subscales with higher values indicating more stable and global patterns of thought.

The Trait Hope Scale. The Trait Hope Scale (THS; Snyder et al., 1991) was administered to assess another dimension of optimism. Participants were asked to rate the extent to which they agree with statements regarding the future. Sample items include “I energetically pursue my goals” and “My past experiences have prepared me well for my future.” The eight items on this scale are divided equally into two subscales: the 4-item pathways subscale (α = .68 in the current study) and the 4-item agency subscale (α = .70 in the current study). Participants responded to statements on an 8-point Likert scale with 1 representing “definitely false” and 8 representing “definitely true.” The responses to each subscale were then summed, resulting in an agency and a pathways score for each participant. Higher scores on both subscales reflect higher levels of trait hope.

Procedure

Participants attended one 30-minute session in a cognitive testing lab. After providing informed consent, participants were asked to complete a computerized version of the IGT. In this version of the IGT, participants were presented with four decks of cards on a computer screen and a $2,000 bank and were told that their goal was to win as much imaginary money as possible in 100 trials. In each trial, participants picked a card from one of the four decks – cards had no visible values, but after each trial they were shown how much money they earned or lost as a result of their choice. Their bank balance was updated after each selection and was shown throughout the task in the corner of the screen. Once the participants were done with the 100 trials of the IGT, they completed three measures of optimism (LOT-R, ASQ, and THS) using an online survey platform. Demographic data were collected at the end of the survey. Upon completion of the study, participants were provided with the opportunity to be entered into a raffle for a $50.00 gift card.

Analyses

Statistical analyses were conducted using SPSS 22.0. Performance on the IGT was scored by dividing the 100 IGT trials into five blocks of 20 cards (i.e. selections 1-20, 21-40, 41-60, 61-80, and 81-100), and computing a score for each block by subtracting the number of disadvantageous deck choices from the number of advantageous deck choices ([C+D] – [A+B]; Lin, Song, Chen, Lee, & Chiu, 2013). The scores for each block were then used in analyses with the expectation that the latter blocks exhibit less risky decision making. Descriptive statistics were calculated for each of the six survey subscales (LOT-R optimism and pessimism, ASQ globality and stability, and THS pathways and agency) as well as for each block of the IGT (Table 1). Pearson’s correlations were used to assess the relationships between the survey subscales (Table 2) and performance on the IGT (Table 3).

Results

Optimism Measures

Table 1 presents the means and standard deviations for each of the subscales and the IGT.

Results indicated that dispositional optimism (*M*= 3.27, *SD* = 0.68) and pessimism (*M* = 2.70, *SD* = 0.81) scores were moderately negatively correlated with each other, *r*(61) = -.68, *p* < .001, supporting the idea that optimism is a bidimensional construct. Correlations among all the optimism-related subscale variables are presented in Table 2 and described below.

The ASQ is composed of two distinct scales. For the stability subscale, scores ranged from 1.82 to 6.73 (*M* = 4.44, *SD* = 1.09), and the scores on the globality subscale ranged from 2.08 to 7.00 (*M* = 4.17, *SD* = 1.35), where higher scores represent a stronger belief in the stability and globality of the cause. Results indicate that these two scales were significantly and moderately correlated, *r*(61) = .40, *p* = .001.

In examining the relationship between LOT-R scales and the ASQ scales, correlational analyses showed that the ASQ stability subscale was significantly correlated with both the LOT-R optimism, *r*(61) = .32, *p* =.011, and LOT-R pessimism, *r*(61) = -.47, *p* < .001 subscales. The ASQ globality subscale was significantly correlated with the LOT-R pessimism subscale, *r*(61) = -.32, *p* = .013, but not to the LOT-R optimism subscale. Overall, these relationships support the use of the ASQ as a measure of optimism, although they do suggest that optimism and attributional style are distinct constructs.

The THS is composed of two subscales (pathways and agency) and neither of these subscales was found to be significantly related to optimism or pessimism as measured by the LOT-R. However, the THS agency and pathways subscales were significantly related to one another, *r*(61) = .58, *p* < .001. Additionally, the THS agency subscale was inversely related to the globality subscale of the ASQ, *r*(61) = -.33, *p* = .009. No other correlations were significant between the ASQ and the THS. Table 2 presents the bivariate correlations between the six subscales measuring optimism and its correlates.

Table 1
Descriptive Statistics for the Measures of Optimism and IGT Scores

Variable	*M*	*SD*	Range
Optimism Measures			
LOT-R Optimism	3.27	0.68	1.67–4.67
LOT-R Pessimism	2.70	0.81	1.00–4.67
ASQ Globality	4.17	1.35	1.82–6.73
ASQ Stability	4.44	1.09	2.08–7.00
THS Pathways	24.48	3.66	15.00–31.00
THS Agency	25.44	3.52	16.00–32.00
IGT			
Block 1	-1.93	3.98	-12.00–10.00
Block 2	2.59	5.85	-10.00–20.00
Block 3	4.16	7.62	-12.00–20.00
Block 4	1.90	9.04	-20.00–20.00
Block 5	2.90	9.32	-20.00–20.00

Relationships with the IGT

There were no significant correlations between the optimism measures and IGT performance (see Table 3). While effect sizes were small (the magnitude of the correlations ranged from .01 to .19), the general pattern of correlations was in the direction hypothesized. Although nonsignificant, the direction of the correlations indicated that the optimism, hope, and attributional style variables were generally negatively associated with IGT performance (18 out of 25 correlations were negative) and pessimism scores were positively associated with IGT scores (four out of five correlations were positive).

Discussion

Relationship Between the IGT and Optimism Measures

Research has consistently shown that decision making is influenced by situational optimism (Sharot, 2011; Moen & Rundmo, 2005; Bracha & Brown 2012). The current study aimed to expand this literature by examining dispositional optimism

Table 2

Bivariate Correlations Among the Optimism, Hope, and Attributional Style Scales

Variable	1	2	3	4	5	6
1. LOT-R Optimism	1					
2. LOT-R Pessimism	-0.68**	1				
3. ASQ Globality	0.12	-.32*	1			
4. ASQ Stability	0.32*	-.47**	.40**	1		
5. THS Pathways	0.03	0.18	-0.06	-0.16	1	
6. THS Agency	0.12	0.15	-.33**	-0.11	.58**	1

Note. **p* < .05, ***p* < .01

Table 3

Bivariate Correlations of the IGT Block Scores with the Optimism Measures

Variable	Block 1	Block 2	Block 3	Block 4	Block 5
LOT-R Optimism	-0.07	-0.04	0.01	-0.10	-0.08
LOT-R Pessimism	0.07	0.12	0.00	0.01	-0.02
ASQ Globality	0.02	-0.19	-0.09	-0.08	-0.14
ASQ Stability	-0.03	-0.07	-0.07	0.02	0.06
THS Pathways	-0.18	-0.01	-0.02	-0.09	-0.13
THS Agency	-0.13	0.09	-0.05	0.02	0.04

rather than situational optimism, as well as two correlates (attributional style and hope) in relation to risky decision making. It was hypothesized that people who are more dispositionally optimistic would be more likely to make risky or disadvantageous decisions. Additionally, it was hypothesized that two constructs closely related to dispositional optimism, namely attributional style and trait hope, would also be positively correlated with risky or disadvantageous decision making.

Correlational analyses examining the relationship between dispositional optimism and risky decision making indicated that they are not significantly related to one another. None of the six subscales (LOT-R optimism and pessimism, ASQ globality and stability, and THS pathways and agency) were significantly related to performance on the IGT. However, it is worth noting that the pattern of correlations is consistent with the hypothesis that increased optimism would be associated with riskier decision making. Collectively, 22 out of 30 correlations (73.33%) were in the direction hypothesized. Though none of the correlations were significant, there may be a small effect that the current study was underpowered to detect.

Relations Among Optimism Measures

Previous research has demonstrated a relationship between attributional style and optimism: people with external unstable attributional styles are more optimistic because they see the cause of a negative event as outside of their control and as unrelated to other aspects of their life (Dykema et al., 1996; Peterson et al., 1982). Consistent with previous research, the ASQ stability subscale was significantly correlated to both the optimism and pessimism subscales from the LOT-R in the current study. The globality subscale, however, was only significantly related to the pessimism subscale.

The results of the current study are not consistent with prior research which has shown that optimism is related to trait hope (Carifio & Rhodes, 2002). In the current study, the relationships among the Hope subscales (agency and pathways) and the LOT-R subscales (optimism and pessimism) were not significant, and the correlations were close to zero indicating that trait hope may be distinct from dispositional optimism and pessimism. Further research should be conducted to examine the relationship between these two constructs. Overall, these findings suggest that while attributional style is closely related to optimism, trait hope as measured by the Trait Hope Scale (Snyder et al. 1991) may not be as similar of a construct to optimism as previously thought.

Limitations

There are several limitations to this study. First, participants were students at a large, urban university, and were disproportionately White and young, leading to questions about the generalizability of these findings. Prior research has found that risky decision-making behavior tends to decrease with age (Deakin, Aitken, Robbins, & Sahakian, 2004; Gardner & Steinberg, 2005) therefore the primarily young sample used in this study may have been prone to making more disadvantageous decisions when completing the IGT. Second, given that research has found that students with high levels of dispositional optimism are more likely to complete college (Solberg Nes et al., 2009), it is possible that the current sample consisted of more dispositional optimists than the general population, limiting the generalizability of results. Third, performance on the IGT has been shown to be influenced by age (Crone & van der Molen, 2004; Fein, McGillivray, & Finn, 2007), so a sample with a wider age range may yield different results. Finally, the sample size was small which may have resulted in the study being underpowered to detect significant relationships between the variables.

Conclusions and Future Directions

In general, the results from this study suggest that dispositional optimism does not significantly contribute to risky decision-making behavior. However, the pattern of correlations does suggest that additional research should be conducted to examine whether a small relationship exists – perhaps with a different measure of decision making or a more diverse sample. The unexpected finding that dispositional optimism is not related to risky decision making indicates that dispositional and situational optimism are distinct constructs with different effects on decision making and behavior. Dispositional optimism is a stable trait characterized by consistent positive expectations regardless of context. Situational optimism, on the other hand, is a change in attitude cued by a context. Since situational optimism results in a change in emotional state, its relationship to context-specific factors may be stronger than the relationship of dispositional optimism to its context. Thus situational optimism may influence decision making whereas dispositional optimism does not.

This study is part of the growing body of literature examining how personality and individual characteristics may influence decision-making behavior beyond one's appraisal of risk and benefits associated with decision making. The finding that hope and optimism are not related is inconsistent with prior research (Carifio & Rhodes, 2002), and therefore warrants further investigation. Future research should focus on better understanding other factors that influence decision-making behavior. A broader perspective on the factors that influence decision making is necessary so that the mechanisms that predict and explain risky decision making can be better understood.

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