

EVALUATING THE RELATIONSHIP BETWEEN INTERNALIZING SYMPTOMS  
AND GIFTEDNESS USING A CONTEXTUALIST APPROACH

A Dissertation

by

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## ABSTRACT

The extant research landscape remains unable to resolve the question of whether or not gifted youth are at a higher risk for internalizing symptoms than their peers, with prominent research supporting both perspectives. Much of this controversy seems to stem from methodologies that do not conceptualize giftedness from the currently accepted contextualist framework. The current study sought to address this concern by investigating the relationship between giftedness, anxiety, and depression using a contextualist model incorporating manifested and developmental potential. In a sample of 162 youth, gifted identification status, academic achievement, and overexcitability were assessed alongside symptoms of anxiety and depression. Group mean comparisons, multiple regressions, and mixed model SEM analyses were conducted to determine the unique predictive value of gifted identification, academic achievement, and giftedness incorporating both manifested and developmental potential.

Results indicated that neither gifted identification nor academic achievement were associated with symptoms of either anxiety or depression; however, a unified gifted latent variable constructed from manifested potential (academic achievement) and developmental potential (intellectual, emotional, and imaginal overexcitability) was able to predict both anxiety ( $\beta = 0.886, p < 0.05$ ) and depression ( $\beta = 0.651, p < 0.05$ ) with a large effect size (RFI = 0.805). This suggests that giftedness has a direct relationship on anxiety and depression when accounting for developmental potential. These results suggest that the way gifted youth interact with their environment puts them at unique risk for developing internalizing symptoms. This has implications for research in that future research in this area

should utilize a contextualist model of giftedness when investigating the prevalence and development of internalizing symptoms, and implications for practice in that educational and mental health professionals should be aware of these developmental impacts when identifying, educating, and treating gifted youth.

## DEDICATION

To my mother, Kelly, whose sacrifices made me the man I am today;  
and to my loving and supportive wife, Brenda, who inspires me to be a better man  
tomorrow.

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All work for the dissertation was completed independently by the student.

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# CHAPTER I

## INTRODUCTION

The concept of giftedness, the idea that some confluence of traits or skills results in some children and adults manifesting extraordinary talents and achieving grand accomplishments, has fascinated scientists and scholars since the days of Plato (Grinder, 1985). Early models of giftedness, stemming from the works of Galton (1869, as cited in Dai 2018), and leading into the seminal studies by Terman (1925), conceptualized giftedness as essentialist (Dai, 2018). These early models attributed giftedness to innate properties, notably intelligence, that manifested as extraordinary aptitude and accomplishments (Dai, 2010). Giftedness was therefore best defined in terms of manifested potential, which refers to objectively measurable products such as high performance on measures of intellectual functioning, academic achievement, or great works. Towards the middle of the 20<sup>th</sup> century, the dominant theories began shifting towards developmental models (Dai, 2018). Under developmental models, giftedness was attributed less to static traits within the individual and conceptualized more so as skills and talents that could be cultivated in childhood and developed over time. These models expanded the understanding of giftedness beyond just manifested potential to include personality traits that contribute to success such as creativity, leadership, and aptitude towards artistic or physical excellence. This was exemplified in the seminal report brought forth by the Office of Education in the United States that became known as the Marland Report (1972). The Marland Report not only outlined specific parameters for defining giftedness but also laid out recommendations for educational programming for the

development of gifted qualities that laid the foundation for many gifted programs that exist today.

Developmental models dominated the field for the latter half of the 20<sup>th</sup> century, but were challenged by Simonton (1999, 2005), who laid the groundwork for what would be known as contextualist models of giftedness. These models sought to resolve the essentialist and developmental models by conceptualizing giftedness as the interaction between innate predispositions such as intelligence and creativity with contextual factors such as educational opportunities, culture, and developmental timing. In other words, giftedness manifests when an individual with high intelligence or creativity exists in a developmental environment that facilitates the cultivation of gifts. In this way, individuals possess a developmental potential that can be realized under the right contextual variables to result in manifested potential. This interaction implies that an individual's developmental potential impacts how the individual interacts with their environment as much as the environment interacts with the individual (Sternberg, 1984). Though we tend to consider this interaction in terms of how it can result in manifested potential, how that interaction can lead to negative outcomes such as mental health concerns remains largely unresolved within the literature.

Much as the conceptual models of giftedness have shifted over time, the perspectives on mental health in gifted individuals also has evolved as well. In the last century and a half, perception of giftedness and mental health in gifted youth amongst psychologists and educators has shifted wildly from a belief that giftedness was associated with vulnerability to mental illness and insanity in the 1800s to arguments that cognitive skills and increased academic achievement are protective factors that put gifted children at lower risk of mental and emotional problems (Martin, Burns, & Schonlau, 2010). Throughout history, one view

or another has dominated the fields of education and psychology with perceptions shifting over time. In the latter portion of the 19<sup>th</sup> century, much of the research focused on the prevalence of “genius” in the insane and infirm, identifying trends of association between insanity and giftedness (Lombroso, 1895). After World War I, the focus of research into mental health among gifted individuals shifted towards the study of cognition and cognitive factors, driven largely by the longitudinal work of Lewis Terman and his colleagues (Terman, 1925, 1935, 1947, 1959). This work led to the understanding that high cognitive functioning, or intelligence, is a resilience factor that protects against mental health problems, thereby making gifted individuals less prone to mental health difficulties (Sears, 1984). This remained the predominant theory amongst psychological and educational researchers, and the issue considered largely resolved, until 1981 when a gifted student named Dallas Egbert made national news after he died by suicide. His highly publicized suicide shifted public perception that gifted youth were immune to mental health challenges with a surge in research investigating the “social and emotional needs of the gifted” (Neihart, 1999, p. 10).

To this day, the debate remains largely unresolved, with research supporting both the perception that gifted youth are as well-adjusted (or better) than their peers and the perception that these youths are at greater risk for mental health problems (Eklund, Tanner, Stoll, & Anway, 2015). A number of arguments have been put forward to explain these discordant results, many focusing on methodological concerns within prior studies such as low sample size, reliance on less sophisticated statistical analyses, and difficulties operationally defining giftedness and identifying gifted populations (Martin et al., 2010). A large methodological concern is the discordance between how giftedness is measured in empirical research inves-

tigating mental health concerns and the currently accepted contextualist models of giftedness. Specifically, the majority of studies have measured giftedness in terms of manifested potential through intelligence testing and academic achievement. This approach fails to capture the variables that contribute to developmental potential and that underscore the foundational interaction between individual and environment intrinsic to the contextualist model of giftedness.

### **Current Study**

The current study investigated the relationship between internalizing symptoms and giftedness in a contextualist framework incorporating both manifested and developmental potential variables in a sample of high achieving adolescents attending an enrichment summer camp. This study collected data on placement in gifted education programs and academic achievement as variables of manifested potential, then investigated if manifested potential predicted depression or anxiety using group comparisons and regression analyses. Also collected were data on overexcitability, or heightened experience of stimuli, as variables of developmental potential. A unified latent variable of giftedness consisting of both manifested potential and developmental potential was constructed, and structural equation modelling was conducted to investigate if the unified giftedness variable predicted variance in depression or anxiety. The study addressed methodological concerns in previous studies by including a large sample size, using sophisticated statistical analyses, and assessing giftedness in a manner more consistent with the currently accepted contextualist model of giftedness.

### **Research Questions**

The following research questions were addressed by the current study:

1. Do adolescents who are identified as “gifted and talented” by their school and placed into a gifted education program have increased levels of internalizing symptoms as compared to high achieving youth that have not been identified by their school? It was hypothesized that there would be no difference in internalizing symptoms between youth identified as gifted and youth not identified as gifted based on the existing literature on group differences between students in gifted programs and their same aged peers, as well as the limitations that lead to imprecise identification of gifted youth by the school system (Sternberg & Clickenbeard, 1995).
2. Does high academic achievement, a proxy for giftedness used in previous research, predict variance in internalizing symptoms within high achieving youth? It was hypothesized that manifested potential, or academic achievement, would not predict variance in internalizing symptoms within the current sample based on the extant literature on risk and resiliency factors related to high achievement, as well as the fact that these criteria identify high achieving youth rather than giftedness more broadly as it is conceptualized using a contextualist model.
3. Do levels of gifted traits as measured by a developmental potential paradigm, in the current study defined as possessing overexcitabilities common in gifted youth as well as higher academic skills, predict variance in internalizing symptoms within high achieving youth? It was hypothesized that developmental potential would significantly predict variance in internalizing symptoms within the current sample based on the contextualism model of giftedness.

## **Implications for Practice**

This study investigates the relationships between giftedness and internalizing problems such as depression and anxiety. The knowledge gained will help address inconsistencies within the research literature, as well as observed discrepancies between research and practice, to contribute to the overall framework for how giftedness is conceptualized. From an applied perspective, results from the study have implications in clinical treatment of these populations as well as educational programming in gifted youth. Understanding how aspects of giftedness can contribute to psychological distress in high achieving youth can help clinicians understand risks these youth face, and thereby more effectively screen for internalizing symptoms. This can lead to earlier and more effective interventions that integrate the unique qualities that gifted youth possess to capitalize on their strengths and accommodate factors that contribute to symptoms. With regard to educational programming, school personnel can better serve as frontline screeners for these youth if they understand how giftedness can lead to psychosocial. Enrichment programs can begin developing supports to monitor psychosocial development and skills training programs to provide gifted youth the tools to identify and manage distress, thereby helping gifted youth reduce internalizing symptoms.

## CHAPTER II

### LITERATURE REVIEW

In order to understand how the current study will contribute to the field of school psychology, it is important to understand both the historical and current perspectives on how “giftedness” is defined. This provides a framework for understanding how researchers view the way that the relationship between giftedness and mental health concerns manifests itself. An understanding of this framework highlights how the debate over mental health problems in gifted youth has developed, and where the current literature has thus far been unable to sufficiently explain discrepancies between clinical observations and empirical research studies.

#### **Essentialist Models of Giftedness**

The conceptualization of giftedness can be traced back to the work of Francis Galton in the middle of the nineteenth century. In his perspective, certain individuals possessed a potential for high achievement characterized by intellect, passion, and a commitment to hard work (Galton, 1869, as cited by Dai, 2018). Although his conceptualization was rudimentary, it would become the foundation of what would be understood as the essentialist models of giftedness. Essentialist models of giftedness are underpinned by the assumption that gifted individuals possess inherit traits that are static and permanent that will always result in some form of manifested potential (Dai, 2018). As the study of giftedness and intellect became more formalized, essentialist models became centered around the concept of general intelligence, or Spearman’s “g,” as the primary representation of these static traits (Spearman, 1904). This was most prominent in the works of Terman (1925) and Hollingworth



(1924, 1942). Terman sought to chronicle the developmental trajectories of gifted youth, who he defined as having an intelligence quotient (IQ) of 140 or greater. Beginning with an original sample of 1,444 children in 1922, which he increased to 1,528 by 1928, Terman documented educational progress, special abilities, interests, play, and personality (Terman, 1925). Considered the first true longitudinal study in psychology, data was collected in 1923, 1928, 1936, 1940, 1945, 1950, and 1955, with follow-up data collection extending past his death into the 1980s (Craven, 1992). One of the most notable findings in Terman's work with regard to essentialism was that IQ was generally maintained across time points. This led to the assumption that IQ was a natural endowment, and because IQ was stable and IQ was a direct manifestation of giftedness, giftedness itself was a natural endowment and therefore a static state across the lifespan. Although Terman would eventually concede that individual differences in motivation and emotional characteristics impacted achievement long term, particularly with regard to career achievement (Terman & Oden, 1959), the legacy of his work was that high IQ individuals were a relatively homogenous group with generally high manifested potential (Terman, 1954). Terman's work also had lasting effects on the conceptualization of mental health development in gifted youth, to be discussed later in this chapter.

Hollingworth (1924, 1942) found similar stability in sample of 12 children with IQs over 180. Over the course of 17 years, she closely followed the development of these children, documenting their social, emotional, and sociological development. Although her work began to focus more on the social-emotional development of these children as the years progressed, she also closely documented that their IQ remained relatively constant and was correlated with academic success. Given that the essentialist models of giftedness were

premised on giftedness being defined by high IQ, this led to belief that giftedness itself was stable across development.

### **From Essentialism to Developmentalism**

Sometime in the 1950s, researchers began challenging the essentialist model, primarily for its rigid definition of giftedness as constrained to individuals with IQs (Dai, 2018). Witty (1958) began to argue for a more inclusive definition that included creativity and leadership traits. He felt that giftedness should include those of remarkable artistic or social accomplishment as well as those of high intellectual or academic achievement. In doing so, he argued against giftedness as a natural capacity, instead conceptualizing giftedness as a manifestation of commitment or drive towards excellence (Jolly & Robbins, 2016). A natural consequence of this argument was that assessment of giftedness shifted from standardized test performance to more naturalistic assessments of manifested achievement. Witty himself was more interested in education than identification, lending a developmental lens to giftedness that would ultimately come to be viewed as a developmental model that would shape how giftedness would be conceptualized for next half of a century (Dai, 2018). This also shaped the belief that giftedness, while still linked to some capacity for high achievement, was something that could be nurtured and curated through educational programming.

The developmental model would be brought into the forefront of clinical and educational policies with the issuance of an official definition of giftedness by the Office of Education in the United States that would come to be termed the Marland Report (Marland, 1972).

This official definition stated:

Gifted and talented children are those... who by virtue of outstanding abilities are capable of high performance... Children capable of high performance include those who have demonstrated any of the following abilities or aptitudes, singly or in

combination: 1) general intellectual ability, 2) specific academic aptitude, 3) creative or productive thinking, 4) leadership ability, 5) visual and performing arts aptitude, 6) psychomotor ability. (p. ix)

A major consequence of this statement was to officially expand the definition of giftedness as encompassing more than high intellectual functioning or academic achievement. This made giftedness more inclusive, but also created difficulty with regard to empirically measuring giftedness in research and practice. Also included in the Marland Report were guidelines for the creation and implementation of gifted-specific programming and curricula. Marland (1972) concluded that without gifted-specific curricula gifted students could suffer similar educational and psychological consequences as would be seen in other special education populations, and that conversely providing gifted-specific curricula could reduce emotional or social difficulties in gifted students. These provisions further solidified the broader understanding that giftedness could be nurtured and developed.

The developmental models came to a head with the publication of Renzulli's (1978) three-ring theory. The three-ring theory emphasized gifted behavior as the determinant factor for giftedness, further pulling away from the essentialist paradigm of giftedness as a trait. He viewed gifted behavior as the confluence of above average abilities, creativity, and task commitment, with greater influence placed on task commitment than previous theories. He felt that giftedness could not be realized without task commitment, something that could be nurtured to promote giftedness in children.

Giftedness was brought into mainstream lifespan development when Feldman (1994, 2003) argued that cognition follows a Piagetian trajectory, but that trajectory is impacted by individual propensities and how they interact with environmental influences. Therefore, those with higher cognitive functions and in environments that nurture creativity and

achievement will progress through the developmental stages more quickly and successfully. In an effort to reconsolidate these developmental theories with psychometric practices and essentialism, Ziegler and Heller (2000) defined giftedness as the point where environmental and developmental conditions are optimum to allow individuals of high capability to manifest their developmental potential. This definition facilitated a budding paradigm shift that focused on the integration of individual and developmental factors, known as contextualist models of giftedness.

### **Bridging the Theories: The Rise of Contextualism**

In 1997, Tannenbaum put forth the argument that in order to fully consolidate developmentalism with person-centrism, the parameters of giftedness had to be reworked (Tannenbaum, 1997). He argued that giftedness could present in a number of discrete domains, including intellectualism, art, and service, by either creatively approaching an activity or becoming proficient in it. This was a distinction that sought to resolve those with high developmental potential and talents (performers) from those with high manifested potential (producers). In this way, an individual could be gifted with regard to high predisposition without the constraint of being measured by the works they produce. It was only under the right developmental and contextual environment that a performer could become a producer.

It was Simonton (1999, 2005) that mapped out Tannenbaum's concepts developmentally, resulting in the emergenic-epigenetic model of talent development. This model proposed giftedness or talent is manifested relative to the given domain and the challenges and opportunities it presents in relation to a specific individual. Thereby manifested potential is salient and somewhat transient depending on the person, domain, social context, and developmental timing. Whether or not manifested potential occurs is relative to the complexity

of the domain, the characteristics and propensities of the individual (as determined by genetics), if those characteristics are additive or multiplicative, and if those characteristics are developmentally matured once the domain presents itself. As Dai (2010) proposed, this interaction results in a differential development wherein the gifted individual may have emergent manifested potential in a developmental context that grows more pronounced over time as the person-environment interaction causes the gifted individual to become further differentiated from their peers.

Perhaps the most prominent of the contextualist models is Sternberg's (1984) triarchic model. This model of giftedness breaks the conceptualization of intelligence and giftedness into three primary components: intelligence as it presents to the external world, intelligence as it relates to task approach, and intelligence as it relates to the internal mechanisms and mental processes. In the first component of this model, intelligence determines how an individual adapts to their environment, shapes their environment to meet their needs, and selects environments that best meet their needs. In this way, the individual is responding to their environmental, and at the same time interacting with their environmental context to change it to their particular needs. This interaction is mediated by internal traits such as intelligence. The second component references how intelligence mediates task approach by increasing novelty and automatization. Individuals that are able to use these task approaches are more likely to demonstrate behaviors that could be understood as intelligent, or gifted. The final component focuses on the internal cognitive processes of gifted individuals. In short, high intelligence or giftedness shapes the way that gifted individuals think about the world and problems they encounter. As with most contextualist models, Sternberg (1984) conceptualized on how these components come together to produce intelligent behavior, or

manifested potential; however, the natural extension of this model is that if gifted traits are shaping both environmental context as well as how gifted individuals are processing and perceiving information, it may have both positive and negative effects given a particular developmental context.

Understanding the historical context for the conceptualization of giftedness from essentialism to contextualism is important because these models not only capture how giftedness is identified, but they also provide a framework for how we understand how gifted individuals and youth interact with the world around them. It also provides a frame of reference for the debate on mental health problems in gifted youth as it will be discussed in upcoming sections. As with the conceptual models of giftedness, the understanding of mental health concerns in gifted youth has experienced heated debate and varied perspectives.

### **The 19<sup>th</sup> Century: The Insanity of Genius**

As early as 1853, psychology and psychiatry were discussing the relationship between giftedness, dubbed “genius” in the literature of the time, and mental health concerns, or “insanity” as it was referenced (Mead, 1853, as cited in Dai, 2018). These works primarily focused on the prevalence of psychiatric conditions amongst genius of notoriety, such as Charles Darwin, Isaac Newton, and Voltaire, and were rooted in the idea that the body had to remain in homeostasis. Therefore, if an individual had an abundance in one domain, such as intelligence or creativity, then there must be a deficit in another area, such as emotional or psychological capacity, leading to madness (Neihart & Yeo, 2018).

In *The Man of Genius*, Lombroso (1899) thoroughly discussed the perceived relationship between genius and insanity or psychiatric difficulties. Although the work is rife

with the limitations of the day, including such practices as phrenology and weighing of cerebral matter, Lombroso and his contemporaries identified a number of features of the genius that contributed to their insanity that would ultimately have analogous constructs in more modern theories of mental health in gifted populations. For instance, Lombroso (1899) identified precociousness as a characteristic of giftedness that resulted in alienation and othering of gifted youth. The echoes of this relationship would later be described as asynchronous development, which results in social rejection by peers (Silverman, 2012). Although admittedly flawed in the underlying logic, even at these early stages of the field psychologists were identifying gifted individuals as uniquely at risk to mental health problems.

### **Intelligence as Resilience**

The idea that giftedness was related to madness remained the prominent theory until Terman (1925) published his seminal work on gifted youth and development. As discussed earlier, this work was the foundation of the essentialist belief that giftedness was defined solely by high IQ, a trait that was stable and constant throughout development. A major conclusion drawn by Terman (1925) in *The Genetic Studies of Giftedness* was that IQ was a resilience factor that shielded gifted youth from a myriad of developmental concerns, including mental health problems. A natural extension of this is that if IQ shields gifted youth from mental health difficulties, and IQ is assumed stable across the lifespan, then gifted individuals would be protected against mental health concerns throughout their lives. Which is generally what Terman found, shaping perspectives for a generation (Terman, 1954). Despite its large sample size, the Terman study suffered some glaring methodological concerns that put a pallor on its conclusions. The sample was 95%-99% white and from upper-middle to upper class families from Northern California, limiting the generalizability of the sample

(Warne, 2018). Additionally, these demographic characteristics themselves have been shown to be factors that increase resiliency in children, or children's ability to cope with and adapt to stressors without developing psychosocial difficulties (Southwick, Litz, & Charney, 2011). Beyond this, the sampling characteristics of the study were further marred by Terman's unique approach to recruitment. Children were recruited into the study if they were tested and obtained an IQ over 140; however, children were only eligible for testing if they were the youngest in their class or were nominated by their teachers as high achieving and potentially gifted (Tannenbaum, 1992). This immediately limited the sample to children with high manifested potential. In retrospect, when looking at the sample from a contextualist lens, it becomes apparent that Terman's studies therefore failed to capture children with high developmental potential but who had yet to achieve high manifested potential, or children who may possess creative, imaginative, or psychomotor gifts, meaning his conclusions were drawn from a highly restricted sample that does not represent the gifted population as it is understood today.

The concept of intelligence as a resilience factor that increases children's ability to cope with stressors was widely studied, and generally accepted as valid (Milgram & Palti, 1993; Cederblad, Dahlin, Hangnell, & Hansson, 1995; Condly, 2006). Intelligence as a general construct has found to have a protective effect in children who face childhood adversity (Fritz, Graaff, Caisley, van Harmelen, & Wilkinson, 2018), chronic illness (Ryland, Lunderbold, Elgen, & Hysing, 2010), and trauma (Masten, Monn, & Supkoff, 2011). In an essentialist framework, this would be sufficient to draw the conclusion that gifted youth, by virtue of being conceptualized in terms of high intelligence, are uniquely protected from mental health concerns. Further, because these individuals are predisposed to be successful,



they are hypothetically shielded from the psychological upheavals that occur through life struggles; however, this is not concordant with currently accepted contextualist models.

Interestingly, while Terman (1925) was conducting his longitudinal study, Hollingsworth (1924) was also studying developmental trajectories in gifted youth and reaching opposite conclusions than Terman. Taking a more qualitative approach to her studies, she identified that gifted youth face unique social, educational, and developmental challenges not typically seen in their peers that put them at increased risk for psychological distress (Hollingsworth, 1942). She identified that gifted youth often face peer rejection and have difficulty sustaining peer relationships, they can have behavioral and emotional difficulties at school as they are not sufficiently challenged and become disengaged, and struggle with existential difficulties at times when peers and adults do not treat their concerns as developmentally appropriate. Though her work is considered widely influential, it did not have the same impact on the research landscape as Terman's. This demonstrates how empirical research and qualitative or applied research have been at odds throughout this debate, with vastly different conclusions drawn from each camp.

### **Anxiety and Depression in Gifted Populations Globally**

Aside from investigating intelligence specifically, many researchers have attempted large scale studies that to look at mental health problems in gifted youth as a whole. When evaluated collectively, the evidence suggests that there is not a significant difference between gifted and nongifted youth with regard to mental health disorders or pathology (Martin, Burns, & Schonlau, 2010). For example, in studies of gifted populations, no difference in the prevalence of depression was found in gifted versus nongifted boys, while some gifted

girls demonstrated lower levels of depression compared to same aged peers (Bartell & Reynolds, 1986; Bénony et al., 2007). Similarly, symptoms of anxiety are consistently found to be lower in gifted youth compared to their peers, suggesting better psychological functioning overall (Forsyth, 1987; Tong & Yewchuk, 1996; Bracken & Brown, 2006). In a study investigating suicidal ideation and depression, Metha and McWhirter (1997) found no significant difference between gifted and typically developing populations with regard to suicidality.

At face value, this would seem to confirm that gifted populations do not suffer from more internalizing symptoms than their peers. In fact, with regard to anxiety, gifted youth often appear to be better adjusted than other children. The difficulty with these conclusions, however, lies in the methodology used to identify and define giftedness. In almost all studies, giftedness was found to be defined in one of three ways: high scores on intelligence testing, high academic achievement, or identification and placement in a gifted education program. In other words, these studies primarily defined giftedness based on manifested potential. Given current conceptualizations of giftedness, the potential exists that these samples do not fully represent the gifted population and how it presents in a contextualist model. Further, no studies appear to analyze the relationship between giftedness and internalizing symptoms within a single sample using multiple different criteria to define giftedness. This limits the ability to draw conclusions about how the way giftedness is identified or measured in research impacts interpretation of how giftedness relates to internalizing symptoms.

### **Problems with Gifted Identification**

Difficulties identifying gifted youth are abundant in both research and practice. As discussed, one of the primary conceptualizations of giftedness is often based in manifested

potential or high achievement on standardized measures of intelligence or academic achievement (Sternberg & Clickenbeard, 1995). This approach is problematic because it does not line up with either current conceptualizations of giftedness from either a theoretical perspective (Dai, 2018) or the practical definition as put forth in the Marland report (1972). Approaching gifted identification in this way implicitly ignores individuals that may possess creative, leadership, or psychomotor gifts but may not be presenting with intellectual or academic achievement. These methods also seem to ignore the important role that creativity plays in giftedness (Torrance, 1995). With regard to the focus of the current study, a natural consequence of this problem is that individuals that demonstrate giftedness in domains other than intellectual or academic achievement have been excluded from studies investigating giftedness and internalizing symptoms.

The other problematic methodology within the research is the use of identification and placement in a gifted education program as the criteria to define giftedness in research studies. It has been well documented that schools often fail to effectively identify gifted youth in a way consistent with the Marland report definition (Sternberg & Zhang, 1995). There is currently a wide range of models and methods used across the United States, and lack of a clear and unifying construct leads to wide variability and inconsistency in gifted identification (Stephens & Karnes, 2000). Identification policies and procedures vary from state to state, and are often updated and modified to more accurately reflect the Marland report definition; however, even with these changes, they are often overly narrow in their focus (Sternberg & Clickenbeard, 1995). Schools frequently use procedures that focus on performance on either individual or group administered standardized measures of intelligence or intellectual functioning. These policies suffer from the pitfalls discussed above. In response, some

schools adopt identification criteria that focuses on creativity, divergent thinking, or leadership; however, these students may not demonstrate the expected level of traditional academic achievement, resulting in schools rejecting their policies (Sternberg et al., 1995). Schools are often resistant to using a creativity model of assessment as creative thinking may be misattributed as resistance to established school norms (Torrance, 1995). Additionally, assessment of creativity is often imprecise due difficulties operationally defining these constructs and assessing them in a standardized way (Sternberg, 1984).

In response, some schools adopt policies that rely on teacher recommendations for gifted placement. While teacher recommendations provide a more naturalistic assessment of giftedness that may better account for environmental variables, teacher perceptions are highly impacted by teachers' implicit personality theories about gifted youth (Baudson & Preckel, 2013). Implicit personality theories refer to perceived patterns between personality characteristics and behaviors (Schneider, 1973). With regard to gifted recommendations, teachers often believe either the harmony hypothesis, which imposes an essentialist view that gifted youth always present as gifted and are more competent in all domains, or the disharmony hypotheses, which imposes the belief that individuals are only gifted if they present with manifested potential in the context of social or emotional maladaptation (Sternberg & Davidson, 2005). Whichever hypothesis teachers ascribe to determines the type of student they refer for gifted programming, creating an artificially restricted sample that may not reflect the gifted population as a whole because they ignore either low achieving students with narrow gifts, or high achieving students that fail to have social or emotional difficulties (Baudson & Preckel, 2013).

These approaches consistently result in policies and procedures that only identify a narrow sample of gifted youth. With these multitude of concerns with identification in school, it is easy to extrapolate how use of school-based identification as research criteria is problematic. If schools are only identifying a narrow sample of gifted youth, then research based on these identifications will naturally only reflect that narrow sample. Further, because policies are so diverse across states and even schools, it is difficult to identify trends across studies using school-based identification because they may be little overlap between samples.

### **Developmental Perspectives on Psychosocial Functioning**

With the rise of developmental models, researchers began shifting their focus to developmental concerns within gifted populations. Although the field remained torn with regard to overall mental health concerns in gifted youth, several main psychological concerns became apparent (Neihart & Yeo, 2018). Specifically, these were poor fit with school environment, achievement conflicts, perfectionism, difficulty accessing peers, and life-planning anxieties.

While it can be argued that all children must have an educational environment that allows them to succeed academically, personally, and socially, this is particularly salient for gifted students who are frequently underchallenged at school (T. L. Cross, 2001). These children may experience disengagement with school and underdeveloped coping strategies for when they are faced with challenges later in life (Niehart, Pfeiffer, & Cross, 2015). Additionally, children facing asynchronous development or who are twice exceptional (i.e., gifted children with disabilities) may not develop a sense of competence, leading to a decrease in positive expectancies for themselves (Neihart & Yeo, 2018). The ability to sustain

effort also may be compromised in children with poor academic fit. Gifted children are at risk for developing fixed mindsets about talent and ability if they succeed too easily early in their schooling because they do not properly learn the relationship between effort and outcome (Blackwell, Trzesniewski, & Dweck, 2007).

In some subgroups of gifted youth, internal dialectics can arise between a drive to achieve and a desire not to be alienated from peers. In gifted girls and minority populations, cultural norms can sometimes discourage high achievement and accomplishment, causing these gifted youth to feel othered by their peers (Neihart, 2006). In college, gifted girls have been found to struggle with social alienation, particularly if they come from economically disadvantaged backgrounds (Ostrove & Long, 2007). Even earlier in school, gifted girls may experience conflict in their identity development as their interests are often misaligned with popular culture and peer interests (Kerr & Maresh, 1994; Kerr & Multon, 2015). This conflict is hypothesized to be the driving force behind the trend of gifted girls being less represented in gifted programming (Reis & Callahan, 1989), as they are more likely to give in to peer influence or deny their giftedness in order to promote social acceptance (Luftig & Nichols, 1990; Swiatek, & Dorr, 1998). Kuriloff and Reichart (2003) found that boys from minority populations and disadvantaged backgrounds struggled with social concept, or perception of their social roles, even when placed in an environment with other high achieving peers. These boys found themselves culturally at odds with their peers at school. When they began to adjust to their new environment, they reported feeling a loss of connectedness with their cultural background, suggesting they felt the need to either choose to remain connected to their culture or face further isolation and potentially lowered standards of achievement.

This can lead to minimizing or hiding their giftedness in an attempt to retain their social connections (Neihart, 2006).

This fits into the larger theme of social isolation that and difficulty connecting with peers that gifted children face on a whole (J. Cross, 2015). School engagement and social development is profoundly influenced by the ability to make and maintain friends (Silverman, 2012). Children tend to select friends based on shared interests, activities, and personalities (Guo, 2006); however, while this is often easily accomplished by typically developing children, gifted children often have developmentally asynchronous interests and traits that differentiate them from their peers (Kerr, 2995; Neihart & Yeo, 2018). They struggle to find peers that are like them and understand their interests and conflicts (Galbraith, 1985). This can lead to social isolation, loneliness, rejection, and externalizing behaviors (Gross, 2002). They begin to see themselves as less socially skilled and less popular than their peers (Cross & Cross, 2015). These feelings can be amplified when gifted youth are placed in exclusive classrooms or curricula, which they perceive as othering and their peers may perceive as special treatment (Udvari & Schneider, 2000; Rizza & Reis, 2001).

Perfectionism in gifted youth has been frequently noted and studied (Speirs Neumeister, Fletcher, & Burney 2015). In her studies of perfections, Speirs Neumeister et al. (2015) found that perfectionism can become associated with concerns about evaluation. Overtime, this puts youth at risk for mental health concerns as they become anxious about the need to continue meeting the expectation of “perfect.” Gifted girls can be particularly susceptible to perfectionistic demands, placing excessive importance on personal standards of accomplishment (Kerr & Multon, 2015). Often times this manifests due to perceived pressure from adults around them and the expectation that they should be perfect (Galbraith,

1985). Because they are frequently told they have high potential, they feel a responsibility to meet that potential at all times.

Perfectionism is not the only source of anxiety for gifted youth. Many gifted youth may face anxiety about career-planning and life-planning. They often fall victim to gender-stereotypes regarding subject and career trajectories (Leder, 2004), feeling pressured to pursue one avenue or another. This can manifest as perception of personal ability, feeling they are better at a gender-stereotyped subject (math and science for boys, language arts for girls), regardless of their actual performance in different subjects (Rudasill & Callahan, 2010). This can steer youth away from courses and careers they may find fulfilling or challenging in order to meet these stereotyped pressures (Kerr & Multon, 2015), creating conflicts of identity and anxiety. They also may face frustration when they cannot merge talents or fall short of external expectations (Kerr & Kurpius, 2004), or quite simply feel that there are simply too many things they want to do in life (Galbraith, 1985). There is evidence to support the need for early and frequent counseling in career- and life-planning, which they may not adequately receive (Neihart & Yeo, 2018).

Silverman (1994) also notes that the very nature in which gifted youth view the world puts them at risk for increased social difficulties. She discusses that they experience higher moral and emotional sensitivity that make them susceptible to perceiving social injustices more personally. This can lead to feeling overwhelmed by world problems, and feeling helpless to try to solve them (Galbraith, 1985). Generally, gifted youth are more routinely described as sensitive and more emotional than their peers, which has come to be understood by some to be a hallmark feature of gifted youth (Silverman, 1983). They are also more



vulnerable when exposed to environments that are not responsive to negative peer interactions they receive, such as bullying (OERI, 1993). The confluence of this sensitivity and lack of supports puts them at greater risk for psychological difficulties as they become older.

### **Giftedness in Clinical Populations**

Another complication within the debate regarding mental health difficulties is the representation of giftedness within clinical populations. While most research has investigated whether gifted populations have more mental health difficulties than their typically developing peers and come to conflicting conclusions, there is compelling evidence that giftedness is overrepresented within clinical populations (Neihart, 1999). In other words, while the percentage of gifted youth presenting with mental health disorder may not differ than the prevalence rates in the typically developing population, the prevalence of giftedness within clinical subgroups is higher than would be expected given the prevalence of giftedness in neurotypical populations (Gowan & Demos, 1964).

Significant study has been put forth towards understanding the relationship between artistic giftedness and mood disorders, with increased levels of artistic manifested potential in these populations (Taylor, 2017). Amongst those treated for bipolar disorder, for example, creative professions, such as university professors, artists, and writers, tend to be overrepresented (Kyaga et al., 2013). This relationship held true across a two-year follow-up. Authors, but not other professions, were also overrepresented in unipolar depression, but not other professions. This is consistent with earlier findings linking creative adults with depression, bipolar disorder, and suicide (Andreasen, 1988; Richards, 1989; Jamison, 1993). Jamison (1989, 1993) in particular noted that there are overlapping cognitive processes between creativity and onset of mania, such as restlessness, grandiosity, irritability, accelerated

thought processes, and feeling of intensity. Whether this relationship due to mood disorders leading to creative thinking, creativity contributing to the development of mood disorders, or an unknown covariate contributing to both remains unresolved (Patra & Balhara, 2012).

Similar cognitive overlaps between artistically gifted adults and psychosis have been found as well (Prentky, 1980; Rothenberg & Burkhardt, 1984). Both creatively gifted writers and those experiencing the onset of psychosis experience translogical thinking, or conceptualization that seems to transcend typical modes of logical thinking (Rothenber, 1990). Overinclusiveness, or combining ideas into categories that may blur conceptual boundaries, was also identified as an overlap in creatively gifted adults and severe psychopathology (Neihart, 1999).

Notably, many of these studies have focused on adult populations, with fewer studies investigating these relationships in children. In adolescents, eating disorders have frequently been an area of investigation (Neihart, 1999). Clinicians have previously identified that the prevalence of above average IQ in adolescent eating disorders ranged from one third to 90% (Rowland, 1970; Dally & Gomez, 1975). A potential mechanism for this relationship proposed by Garner (1991) was that early labelling of gifted youth leads to internalized expectations, contributing to perfectionism and anxiety which evolve into eating disorders. In another manifestation of anxiety beyond eating disorders, mathematically gifted youth have been found to exhibit increased symptoms of obsessive-compulsive symptoms (Parker, 1996).

## **Current Perspectives and Limitations in the Literature**

Ultimately, there seems to be evidence to suggest that gifted youth are both uniquely protected from mental health concerns and at the same time uniquely susceptible to internalizing symptoms and mood disorders related to peer isolation, social difficulties, and educational development. Current epidemiological studies that have investigated mental health concerns have primarily done so through an essentialist model, identifying giftedness through high manifested potential, rather than a contextualist model that accounts for developmental potential as well as manifested potential (Martin et al., 2010). It is studies with consideration of developmental factors that have identified unique challenges that gifted youth face, but these studies have rarely investigated how these challenges might ultimately result in mental health problems (Neihart & Yeo, 2018).

If giftedness is conceptualized through a contextualist model wherein natural abilities and environmental influences interact to produce unique outcomes, it becomes imperative that risks youths face take into account both ability and environment. Contemporary applications of the contextualist model have focused on how the interaction of abilities and environmental influences impact developmental potential to result in high manifested potential (Dai, 2018). This has placed influence on how individual and environmental influences come together to produce positive results. If that interaction can exert a positive influence, there exists the possibility that how gifted individuals interact with the world also can result in a negative influence, namely internalizing symptoms.

How that interaction manifests is uniquely tied to developmental potential. One representation of developmental potential is the concept of overexcitabilities (Ackerman, 1997). Dabrowski (1964) put forth the concept of overexcitability as a method to identify gifted

individuals by identifying the way they interact with the world in unique ways. Specifically, he identified five domains of overexcitability that exist in gifted individuals: intellectual, emotional, imaginal, sensual, and psychomotor. Intellectual overexcitability refers to a drive to seek knowledge and solve problems. Not to be confused with intelligence, which is the aptitude or ability to solve problems, intellectual overexcitability is the fulfillment from and desire to seek out intellectually engaging stimuli. Emotional overexcitability is the depth at which individuals perceive and therefore seek out emotions and emotional connections. This can manifest as emotion seeking, such as searching for deep and meaningful relationships, or emotional overstimulation, such as shyness or aversion to emotional content. Imaginal overexcitability is often associated with creativity, and refers to the propensity to imagine things in vivid or inventive ways. Sensual overexcitability is heightened sensory pleasure, often characterized by seeking out textures, art, or food. Finally, psychomotor overexcitability is an excess of energy that drives individuals to be active, almost to the point of impulsive. Ultimately, what Dabrowski (1964) was attempting to explain with these overexcitabilities is why gifted individuals interact with their environment the way they do in order to develop manifested potential.

The benefit of using overexcitability in conjunction with standardized measures of manifested potential is two-fold. First, it conceptualizes giftedness in a manner more consistent with Sternberg's (1984) triarchic model, a prominent contextualist model of giftedness. It addresses both the first and third components of the triarchic model by measuring both how giftedness is observed in an external context while also addressing the internal mechanisms that mediate the interaction between gifted individuals and their environment.

Second, it is an identification approach that remains consistent with both theoretical conceptualizations of giftedness (i.e., contextualist models) and the practical definition of giftedness set out in the Marland report (1972). It encompasses academic aptitude and factors that correlate with intellectual functioning (e.g., performance on a standardized academic test), as well as personality factors that correlate with intellectual achievement (i.e., intellectual overexcitability), creative thinking (i.e., imaginal overexcitability), and psychomotor ability (i.e., psychomotor overexcitability) as they are identified in the Marland definition (Marland, 1972; Piechowski & Miller, 1995).

If overexcitability is modulating how high manifested potential is developing, it is playing a key role in moderating how gifted youth perceive the world. It can be argued that in order to truly understand the risks these youth face, it is important to understand how this moderating effect may play into the developmental of internalizing in the context of their abilities. Therefore, a missing piece in the literature is the relationship between giftedness when accounting for both manifested and developmental potential in a contextualist model. It is this contextualist model that the current study sought to address when investigating internalizing symptoms in gifted youth.

## CHAPTER III

### METHODS

The current study utilized a cross sectional design. Giftedness was assessed in multiple ways, including formal identification and placement in gifted programs at school, manifested potential, and developmental potential. While mental health is a broad category including multiple disorders, the focus of this study is on internalizing symptoms as assessed using standardized self-report measures. Relationships between giftedness and internalizing symptoms were analyzed using t-tests, multiple regressions, and structural equation modeling. Power analyses to estimate sample size needed to achieve a large effect size ( $f^2 = 0.35$ ) at  $\alpha = 0.05$  and a power of 0.95 indicated that a total sample of 70 was necessary to reach significant results. To reduce Type II errors, a significance level of 0.05 was set *a priori* for all analyses.

#### **Participants**

Participants in the current study were recruited through an enrichment program for high achieving youth to participate in research investigating the interaction between giftedness and psychopathology. 204 were enrolled in the program and approached to participate in the study. In total, 173 individuals consented to participate. Eleven participants elected not to complete the protocol at the time of assessment, and one participant's responses were deemed invalid due to random responding and the data were removed. After attrition and removal of invalid data, a final sample of 162 participants (43.6% male) was obtained. Participants were adolescents between the ages of 141 to 210 months ( $\Sigma = 178$ ,  $SD = 19.3$ ) recruited as part of a larger study through an enrichment program run through the home

institution. Recruitment occurred through emails to enrolled adolescents and in-person recruitment during camp registration. Informed consent/permission was obtained from parents of participants, and formal assent was obtained from study participants directly.

The enrichment program is marketed towards high achieving students who are highly motivated to learn, think, and solve problems. Any student who will be entering into the 6<sup>th</sup> through 12<sup>th</sup> grade is able to attend, with applications accepted on a first come, first served bases. In order to participate in the study, participants had to be enrolled in the enrichment program, speak English as their primary language, and not have a previously diagnosed neurocognitive or neurodevelopmental disorder. Participants were excluded if English was not their primary language. The study was approved by the Texas A&M University Institutional Review Board (IRB).

## **Measures**

**Woodcock-Johnson Tests of Achievement, Third Edition.** The Woodcock-Johnson Tests of Achievement, Third Edition (WJ-III; Woodcock, McGrew, & Mather, 1989), Math Fluency and Reading Fluency subtests were administered as measures of manifested potential. The Math Fluency subtest consists of 160 single digit math facts including addition, subtraction, and multiplication that participants solved as quickly as possible. The Reading Fluency subtest consists of 98 statements that participants read, then marked as either True (e.g., A horse is an animal) or False (e.g., Fire is cold). The statements are designed to be easily evaluated to specifically measure reading as opposed to verbal reasoning. Both subtests were timed for three minutes in accordance with standardized instructions, and participants completed as many items as possible in the allotted time. If participants finished all items before the time had elapsed, they indicated they were finished by

raising their hand and the elapsed time was recorded. Reliability and validity estimates were established by the publisher, Riverside Publishing, during validation. The Math Fluency and Reading Fluency subtests both demonstrated strong internal consistency ( $\alpha > 0.80$ ) with the standardization sample.

**Behavior Assessment System for Children, Second Edition.** Participants completed the Behavior Assessment System for Children, Second Edition, Adolescent Self-Report of Personality (BASC-II; Reynolds & Kamphaus, 1992) as a measure of anxiety and depression symptoms. The BASC-II is a 176 item self-report measure considered a broad-band measure that assesses symptoms of externalizing symptoms (e.g., attention, hyperactivity, aggression), internalizing symptoms (e.g., anxiety, depression, withdrawal), and adaptive functioning (e.g., activities of daily living, adaptability). For this study, only the depression and anxiety scales were analyzed for several reasons. Primarily, these symptoms were of particular interest to study managers. Further, prior research has suggested that depression and anxiety manifest uniquely within the gifted population (Neihart & Yeo, 2018). Finally, although the BASC-2 produces an Internalizing Composite that is more psychometrically robust than the depression and anxiety scales individually, it was chosen not to use the Internalizing Composite to reduce covariance with the individual scales that might interfere with above considerations. On the first 69 questions, participants read a series of statements and indicated if the statement accurately described them (“True”) or did not describe them (“False”). For the remaining questions, participants read a statement and indicated how often they experienced the thought or behavior described using a four-point Likert scale ranging from “Never” to “Almost Always.” It took approximately 30 minutes for participants to complete. Reliability and validity estimates were established by the publisher,



Pearson, during validation. The anxiety and depression scales both demonstrated strong internal consistency ( $\alpha > 0.80$ ) with the standardization sample.

**Overexcitabilities Questionnaire, Second Edition.** Participants completed the Overexcitabilities Questionnaire, Second Edition (OEQ-II; Falk, Lind, Miller, Piechowski, & Silverman, 1999), as a measure of developmental potential. The OEQ-II is a 50 question self-report questionnaire assessing overexcitability in the domains of intellectual (e.g., “I love to solve problems and develop new concepts”), emotional (e.g., “I am deeply concerned about others”), imaginal (e.g., “Things that I picture in my mind are so vivid that they seem real to me”), sensual (e.g., “I love to listen to the sounds of nature”), and psychomotor (e.g., “If an activity is physically exhausting, I find it satisfying”) overexcitabilities. Each question required the participant to read a statement and indicate how much the statement describes them on a five-point Likert scale, with a score of “1” indicating “Not at all like me” and a score of “5” indicating “Very much like me.” It takes approximately 10 minutes to complete. The OEQ-II has been externally validated using sophisticated Bayesian structural equation modeling (De Bondt & Van Petegem, 2015), and has previously been demonstrated to be a valid measure of developmental potential in gifted children (Piechowski & Miller, 1995). Within the current sample, the OEQ-II demonstrated acceptable internal consistency (Cronbach’s  $\alpha = 0.748$ ).

**Demographic Questionnaire.** Each participant completed a demographic questionnaire to gather basic demographic information. Information gathered in the demographic questionnaire included date of age, grade, gender, current GPA, and SAT/ACT test scores if available. Also included was information regarding curriculum, specifically enrollment in honors courses or advanced placement (AP) courses, and if the participant was involved in

a gifted and talented (GT) program at their school. If participants had been identified as gifted by the school, length of time in the GT program was collected. The demographic questionnaire can be found in Appendix B.

### **Procedures**

Data was collected as a group administration during a designated time scheduled into the camp itinerary. Twenty to 30 participants were administered the WJ-III subtests simultaneously using the group administration instructions indicated by the publisher of the measure. Administration was completed by the author with support from an undergraduate research assistant trained on all measures. Once the WJ-III subtests were administered, packets of self-report measures were distributed to the participants, including the demographic questionnaire, BASC-II, and OEQ. Participants completed all self-report items during the remainder of the session. During this time, the author and the undergraduate research assistant were available to clarify any test items for the participants. All items were scored consistent with standardization procedures, entered into database and the database fully de-identified.

### **Planned Analyses**

Analyses were conducted through R-project open source statistical analysis software (R Core Team, 2018). To determine normality of distributions, the skewness and kurtosis statistics were divided by their standard error. Values above three were considered abnormal, in accordance with Kline (1998). Depression was positively skewed and overly kurtotic. To correct for this, a restricted range technique was implemented, in which scores were corrected to fall within two standard deviations of the mean. Any outlier scores were changed so that the values fell exactly two standard deviations above or below the mean.

This technique reduced the skewness and kurtosis to acceptable ranges. The following analyses were run to address each research question.

To address the first research question, individual *t*-tests were run to evaluate group differences between participants identified as gifted by their school and placed in GT programs and peers not identified as gifted. Individual *t*-tests were run comparing group means for both anxiety and depression. Exploratory *t*-tests also were run to evaluate group mean differences for both manifested potential and developmental potential given the literature suggesting that current policies for identification of gifted youth may not accurately identify gifted students. A significance level of  $p = 0.05$  was set for all *t*-tests, with a Bonferroni correction to account for multiple comparisons.

To address the second research question, multiple linear regressions were run using manifested potential (math and reading achievement) to predict anxiety and depression scores on the BASC-II. Additional exploratory analyses using an overexcitabilities composite to represent developmental potential were run to determine how developmental potential predicts anxiety and depression scores. Missing data for regressions was accounted for with mean substitution. Regression coefficients ( $\beta$ ) significant at the  $p = 0.05$  level were considered to be predictive of anxiety and depression.

Finally, to address the third research question, mixed model structural equation modelling (SEM) was conducted to evaluate how a contextualist composite of giftedness predicts anxiety and depression within the sample. A confirmatory factor analysis (CFA) was conducted using maximum likelihood estimation to create a common gifted factor using the five OEQ-II domains and the two WJ-III subtests. The model was evaluated using  $\chi^2$  and root mean square error of approximation (RMSEA), and adjusted based on model fit indices until

acceptable fit was achieved ( $RMSEA < 0.08$ ). The initial model including all five OEQ-II domains failed to achieve model fit. Prior research has demonstrated that the intellectual, emotional, and imaginal overexcitabilities are most strongly associated with gifted youth (Mendaglio & Tillier, 2006). Based on these findings, these three variables were chosen for the final model. The final model included the WJ-III subtests and intellectual, emotional, and imaginal scales from the OEQ-II, and achieved acceptable model fit. A mixed model was then run using this common gifted trait factor to predict anxiety and depression on the BASC-II. The final model is represented in Figure 1.

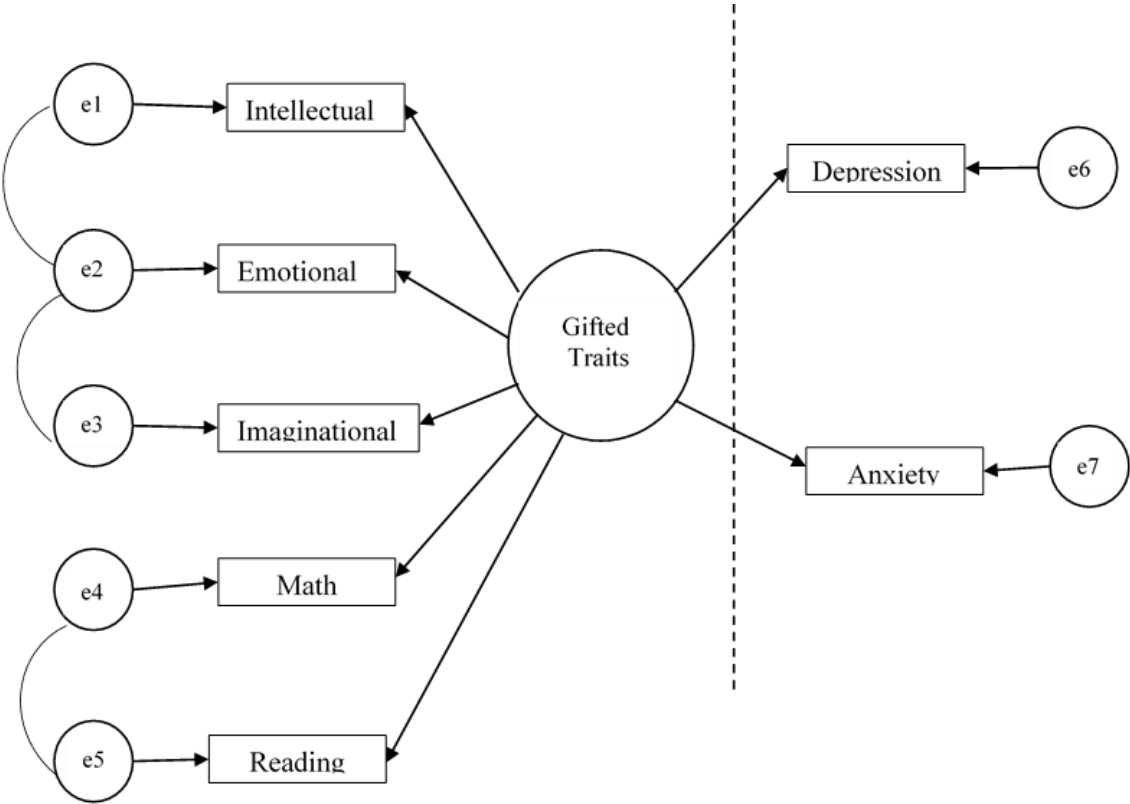


Figure 1. *Mixed model of giftedness predicting internalized symptoms*

## CHAPTER IV

### RESULTS

#### **Preliminary analyses**

Means and standard deviations were obtained for the sample across all relevant variables, including age, psychomotor overexcitability, sensual overexcitability, imaginal overexcitability, intellectual overexcitability, emotional excitability, total excitability, reading, math, anxiety, and depression. Means and standard deviations are included in Table 1 in Appendix A. Independent t-tests were run to determine if any significant gender differences existed within the sample, and no variables were significantly different between genders.

Two-tailed correlations among age, psychomotor overexcitability, sensual overexcitability, imaginal overexcitability, intellectual overexcitability, emotional excitability, total excitability, reading, math, anxiety, and depression are presented in Table 2 in Appendix A. Two-tailed statistics were selected to reduce Type II error. Of note, age was significantly correlated with anxiety ( $r = 0.23, p < 0.001$ ) and depression ( $r = 0.34, p < 0.001$ ). All of the overexcitability variables were intercorrelated ( $r = 0.22-0.56, p < 0.001$ ) with the exception of psychomotor overexcitability, which was correlated with intellectual overexcitability ( $r = 0.20, p < 0.001$ ) and emotional overexcitability ( $r = 0.16, p < 0.01$ ) but not sensual overexcitability or imaginal overexcitability. Overexcitability variables were not correlated with either math or reading. Psychomotor overexcitability was negatively correlated with both anxiety ( $r = -0.18, p < 0.01$ ) and depression ( $r = -0.14, p < 0.05$ ). Anxiety was significantly correlated with imaginal overexcitability ( $r = 0.19, p < 0.01$ ),

emotional overexcitability ( $r = 0.27, p < 0.001$ ), reading ( $r = 0.38, p < 0.001$ ), and math ( $r = 0.37, p < 0.001$ ). Depression was significantly correlated with reading ( $r = 0.33, p < 0.001$ ) and math ( $r = 0.34, p < 0.001$ ). Anxiety and depression were highly correlated ( $r = 0.81, p < 0.001$ ), as were reading and math ( $r = 0.27, p < 0.001$ ).

### **Group Analyses**

Group comparisons were conducted between participants identified as gifted by their school and enrolled in a gifted education program (GT;  $n = 80$ ) and participants that had not been identified as gifted (Non-GT;  $n = 82$ ) to examine group differences in anxiety and depression. Age was significantly different between the two groups, with the Non-GT group consisting of older individuals ( $t$ -statistic = 3.029,  $p < 0.01$ ). Exploratory analyses also were conducted to examine group differences in psychomotor overexcitability, sensual overexcitability, imaginal overexcitability, intellectual overexcitability, emotional overexcitability, reading, and math. No significant group differences were observed across any variables other than age. Results are included in Table 3 in Appendix A.

### **Regression Analyses**

Separate regression analyses were run to predict anxiety and depression using reading and math as predictors. The predictors were entered into the model in one step using forced entry. A summary of these analyses is included in Table 4 in Appendix A. For both anxiety and depression, the proposed models accounted for only 0.01% of variance, and neither reading nor math were significant predictors. Notably, age was not a significant predictor of anxiety, but did significantly predict higher levels of depression ( $\beta = 0.21, p < 0.05$ ).

### **Mixed Model SEM Analyses**

An initial model was constructed to build a latent variable of giftedness using psychomotor overexcitability, sensual overexcitability, imaginal overexcitability, intellectual overexcitability, emotional excitability, reading, and math. The initial model failed to demonstrate adequate fit, with modification indices indicating the removal of two variables. Psychomotor overexcitability and sensual overexcitability were chosen to be removed as psychomotor overexcitability demonstrated the lowest correlation with other variables, and sensual overexcitability had the lowest predicted variance in the giftedness latent variable. The subsequent model demonstrated adequate fit ( $\chi^2 = 5.391$ , RMSEA = 0.070) and was used in subsequent analyses.

A mixed model SEM was constructed using the giftedness latent variable to predict anxiety and depression. Additionally, age was included in the mixed model as a predictor of anxiety and depression within the model given the significant correlation between age and internalizing variables. The mixed model continued to demonstrate adequate fit ( $\chi^2 = 25.260$ , RMSEA = 0.060) with no indicated modifications. Further, the model adequately explained a significant amount of variance within all variables (CFI = 0.950, RFI = 0.743). A summary of model fit statistics is included in Table 5 in Appendix A. Within the full model, intellectual overexcitability, emotional overexcitability, and imaginal overexcitability continued to be significant predictors ( $\beta = 0.205-536$ ,  $p < 0.05$ ). When incorporating all variables, math and reading failed to remain significant predictors. Age was also not a significant predictor of either anxiety or depression within the model. Giftedness significantly predicted both anxiety ( $\beta = 0.912$ ,  $p < 0.05$ ) and depression ( $\beta = 0.630$ ,  $p < 0.05$ ). The full model with coefficients can be found in Figure 2.

## Exploratory Models

In addition to the *a priori* one-factor model, several exploratory models were also analyzed based on initial results of the mixed model. Given potential sex differences within the variables, multiple group analyses were conducted by sex group. The male group analysis achieved adequate model fit ( $\chi^2 = 24.071$ , RMSEA = 0.075) and explained a significant amount of variance (CFI = 0.934, RFI = 0.657). Within the male group model, emotional overexcitability and imaginal overexcitability were both significant contributors to the model ( $\beta = 0.581$  and  $0.556$ , respectively,  $p < 0.05$ ). Of note, intellectual overexcitability was not a significant predictor in the male group model ( $\beta = 0.178$ ,  $p = 0.138$ ). Reading and math did not significantly contribute to the model, and age remained a nonsignificant predictor on either anxiety or depression.

Giftedness remained a significant predictor of both anxiety ( $\beta = 0.864$ ,  $p < 0.05$ ) and depression ( $\beta = 0.680$ ,  $p < 0.05$ ). The female group model achieved strong model fit ( $\chi^2 = 18.200$ , RMSEA = 0.046) with a significant amount of variance explained (CFI = 0.962, RFI = 0.563). Overexcitability variables remained significant contributors to the model ( $\beta = 0.535$ - $0.306$ ,  $p < 0.05$ ). Reading and math did not significantly contribute to the model. Age was not a significant predictor of depression; however, age predicted lower symptoms of anxiety within the female group mixed model ( $\beta = -0.201$ ,  $p < 0.05$ ). Giftedness remained a significant predictor of both anxiety ( $\beta = 0.864$ ,  $p < 0.05$ ) and depression ( $\beta = 0.663$ ,  $p < 0.05$ ).

Because reading and math did not significantly contribute to the mixed model but were significantly correlated with both anxiety and depression, a two-factor model was tested in which developmental potential and manifested potential were treated as separate



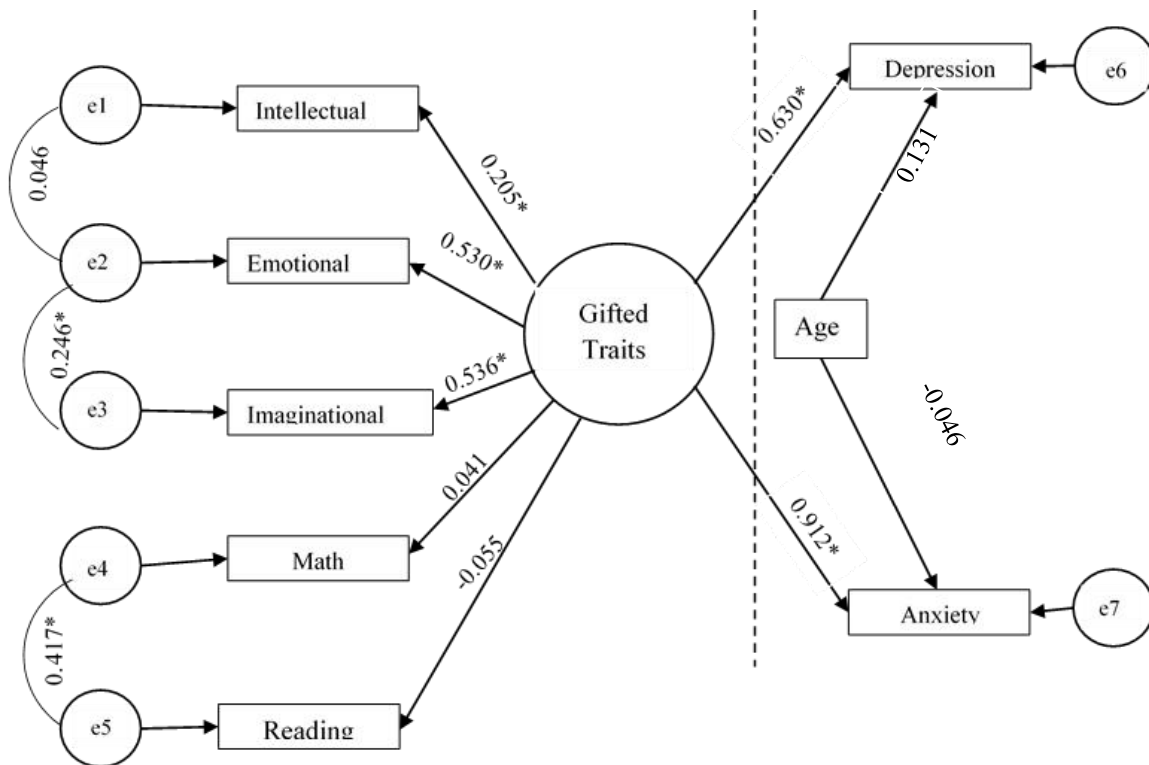


Figure 2. Mixed model with coefficients. \*  $p < 0.05$

factors. The two-factor model tested is illustrated in Figure 3. The two-factor model failed to reach convergence and produce interpretable results. Reading and math did not significantly load on a single variable of manifested potential.

To fully test this relationship, a final mixed model was run with a latent developmental potential variable composed on intellectual, imaginational, and emotional potential while math and reading were treated as independent observed variables. Age was also included in the model as a predictor of anxiety and depression. This model demonstrated acceptable model fit ( $\chi^2 = 22.008$ , RMSEA = 0.060) with significant variance explained within the model (CFI = 0.957, RFI = 0.744). Intellectual, imaginational, and intellectual overexcitability significantly contributed to the model ( $\beta = 0.174-0.534$ ,  $p < 0.05$ ). Developmental

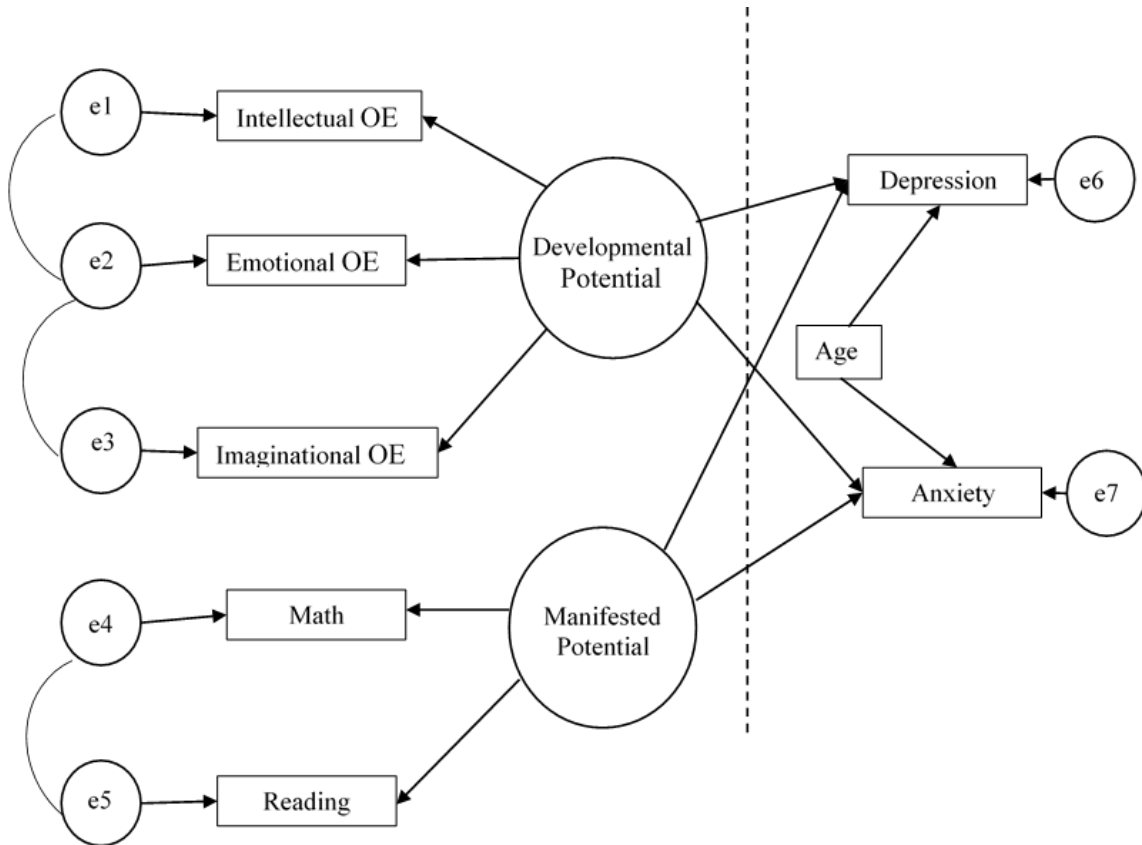


Figure 3. *Two-factor mixed model.*

potential significantly predicted both anxiety ( $\beta = 0.909, p < 0.05$ ) and depression ( $\beta = 0.629, p < 0.05$ ). Neither age, math, nor reading significantly predicted anxiety or depression in the model. The full model with all coefficients can be found in Figure 4.

Multiple group analyses were run by sex with the updated mixed model. The male group model demonstrated acceptable fit ( $\chi^2 = 24.006, RMSEA = 0.089$ ) with significant variance explained (CFI = 0.918, RFI = 0.609). Emotional overexcitability and imaginal overexcitability were both significant contributors to the model ( $\beta = 0.592$  and  $0.585$ , respectively,  $p < 0.05$ ), while intellectual overexcitability was not a significant contributor to the model. Developmental potential significantly predicted both anxiety ( $\beta = 0.859, p < 0.05$ ) and depression ( $\beta = 0.661, p < 0.05$ ). Neither age, math, nor reading were significant

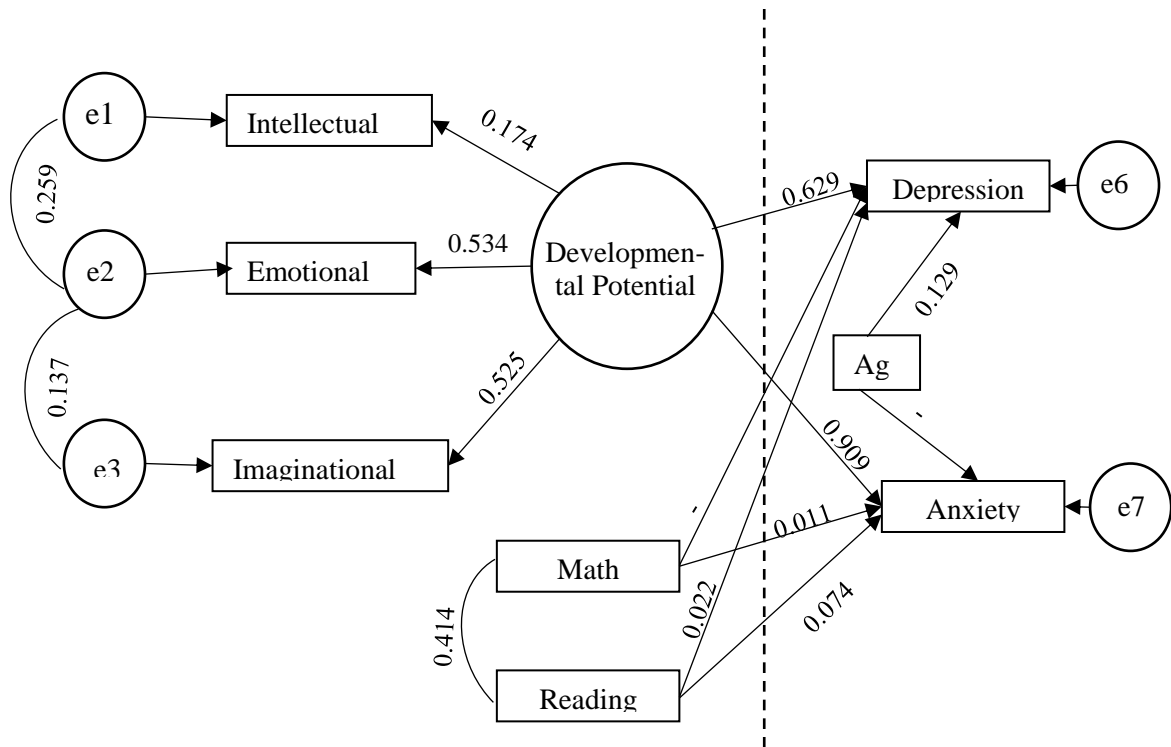


Figure 4. *Exploratory mixed model. \*  $p < 0.05$*

predictors of anxiety or depression. The female group model demonstrated good fit ( $\chi^2 = 14.768$ , RMSEA = 0.029) with significant variance explained (CFI = 0.987, RFI = 0.594). Emotional overexcitability and imaginal overexcitability were both significant contributors to the model ( $\beta = 0.438$  and  $0.460$ , respectively,  $p < 0.05$ ), while intellectual overexcitability was close to reaching significance ( $\beta = 0.243$ ,  $p = 0.058$ ). Developmental potential significantly predicted both anxiety ( $\beta = 1.000$ ,  $p < 0.05$ ) and depression ( $\beta = 0.574$ ,  $p < 0.05$ ). Neither age, math, nor reading were significant predictors of anxiety or depression. Fit statistics for all exploratory models can be found in Table 5 in Appendix A.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The present study sought to examine three research questions. The first sought to evaluate if adolescents identified as gifted by their schools and placed into gifted education programs demonstrated more anxiety or depression than their peers who were not identified as gifted through the school system. Previous research investigating this relationship has failed to find significant differences between students in gifted education compared to their same aged peers (Bartell & Reynolds, 1986; Forsyth, 1987; Tong & Yewchuk, 1996; Bracken & Brown, 2006; Bénony et al., 2007); however, given that students in gifted education programs often face social difficulties due to negative peer perceptions and difficulty connecting with same aged peers, it could be expected that these individuals may face more psychological difficulties than youths that are not in gifted education programs (Neihart & Yeo, 2018). Therefore, this remains an area of contention within the current literature, but it was hypothesized that youths identified as gifted through their school would not demonstrate high levels of anxiety or depression.

The second research question evaluated if manifested potential, measured as academic achievement, predicted anxiety or depression in the current sample. As with the initial research question, significant research has previously demonstrated that individuals identified as gifted through manifested potential do not have significant higher levels of anxiety or depression (Martin, Burns, & Schonlau, 2010). These studies have used group level analyses to determine if these individuals demonstrate higher absolute levels of symptoms or diagnoses, but have not used regression analyses to evaluate if manifested potential predicted

levels of symptoms. Because intelligence and academic achievement have previously been demonstrated to be protective factors with regard to internalizing symptoms (Milgram & Palti, 1993; Cederblad, Dahlin, Hangnell, & Hansson, 1995; Condly, 2006), it was hypothesized that academic achievement would not significantly predict differences in anxiety or depression.

The final research question sought to identify if giftedness conceptualized in a contextualist model accounting for both manifested and developmental potential predicted anxiety and depression. This model incorporated manifested potential measured as reading and math achievement and developmental potential measured as overexcitability to build a unified and continuous variable of giftedness. Overexcitability has previously been demonstrated to be a key component of giftedness that contributes to how gifted youth perceive and interact with their environment in order to develop gifted behavior (Dabrowski, 1964). By including this measure of developmental potential into the conceptualization of giftedness, the current study accounted for the person-environment interaction that underlies the contextualist model of giftedness currently accepted within the field (Dai, 2018). The latent giftedness variable was then used to predict levels of anxiety and depression. Because this approach is more consistent with the accepted contextualist model, it was hypothesized that the unified giftedness variable would significantly predict anxiety and depression where other research has been unable to establish a relationship between giftedness and internalizing symptoms.

Based on results of the planned analyses, additional exploratory models were run to better understand the mechanisms underlying the observed relationships. Developmental

potential (i.e., overexcitability) and manifested potential (i.e., reading and math) were entered into a mixed model individually to evaluate their unique contributions to anxiety and depression.

### **Gifted Identification**

As hypothesized, being identified as gifted and participating in gifted education was not a significant predictor of either anxiety nor depression. This was not a surprising finding in light of previous research. What was more telling were exploratory analyses that investigated other areas of manifested and developmental potential in participants identified as gifted and not identified as gifted through their school. Specifically, there were not significant group differences between any of these variables when comparing identified and non-identified adolescents. This would seem to suggest that current policies and procedures that identify students as gifted within the school do not demonstrate the appropriate specificity to identify gifted students from their peers in the first place, a well-documented problem within the school (Jolly & Robbins, 2016). This is particularly problematic within the literature as a large number of studies that suggest that gifted youth are as well or better developed psychologically than their peers have used school based gifted identification as group criteria.

Therefore, two main points can be taken from what this implies regarding both practice and research. First, it suggests that it is important for schools and psychologists to develop and implement more effective methods of identifying gifted youth that are based in a contextualist framework. While the benefits of gifted specific education have often come under debate (Rogers, 1991; Neihart, 2007), it would seem intuitive that those benefits

are moot if there is not an effective method of identifying gifted youth so that they can be included in said programming.

Second, these results challenge that position that students identified as gifted and placed in gifted education are somehow protected from psychological difficulties. Ultimately, if the placement in gifted education does not reflect differences in gifted characteristics, it would likewise not reflect differences in psychosocial functioning. Any conclusions drawn from studies investigating psychosocial functioning based on gifted identification would be suspect as samples may or may not accurately reflect the gifted population as whole. It may also be the case that gifted individuals with higher symptoms of anxiety or depression may not be demonstrating academic success or may be forming poor school relationships due to their difficulties. If this is the case, these students were likely discounted from previous studies, artificially skewing the results.

### **Manifested Potential as a Predictor of Giftedness**

As hypothesized, manifested potential measured as academic achievement did not predict differences in anxiety or depression in regression analyses despite strong correlations. This is consistent with previous research that has found little to no difference in internalizing symptoms or diagnoses in high achieving samples (Martin et al., 2010). While not a novel finding, the use of regression analyses allowed the current study to demonstrate that academic achievement had no predictive power with regard to internalizing symptoms. From a contextualist standpoint, this relationship makes sense as internalizing symptoms would negatively impact how the individual interacts with their environment, in this case the

education system, thereby limiting the manifested potential that a gifted youth would demonstrate. These results make a strong case against using academic achievement as a determinant of giftedness when studying these relationships.

### **The Importance of the Developmental Potential in a Contextualist Framework**

The most compelling results from this study arose from the mixed model SEM analyses that used both manifested and developmental potential to measure giftedness within a contextualist framework. The final hypothesis, that giftedness conceptualized in a contextualist framework, was strongly supported. Not only was giftedness a significant predictor of both anxiety and depression, but the coefficients and explained variance within the model were quite high. This would appear to bridge the gap between empirical research that suggests there is not a relationship between giftedness and internalizing symptoms, and qualitative research that has repeatedly argued that these youth face unique developmental challenges that put them at risk for psychosocial difficulties (Neihart, 1999).

Importantly, the driving factor of the model was developmental potential, which was a significant contributor to the overall model, as opposed to manifested potential, whose contributions diminished when all variables were included. This was further exemplified when developmental potential and manifested potential were separated in exploratory analyses. In these analyses, it was only developmental potential that predicted anxiety and depression. This makes sense from a contextualist standpoint, as developmental potential drives the way that gifted youth interact with their environment. It would not be expected that manifested potential, or the end product, would drive the development of internalizing symptoms, which are themselves a form of manifested potential. At best, it would be ex-



pected that these would be correlated, which they were within the current sample. Developmental potential, on the other hand, can be understood as fundamentally shaping how these youth interact with the world, and thereby predicting and explaining why gifted youth may develop internalizing symptoms at all.

This highlights the importance of using a contextualist framework to interpret these results. An essentialist approach would assume that manifested potential, as the defining characteristic of giftedness, would be the largest contributor to the model. From a developmental perspective, it would likely be age or social context (e.g., placement in gifted programming) that would predict internalizing symptoms, as this framework conceptualizes giftedness as the culmination of environmental influences (Dai, 2018). In contrast, the current results indicate that it is the personality traits that mediate the way gifted youth interact with their environment that are primarily driving the relationship.

Particularly emotional and imaginal overexcitability contributed to anxiety and depression. It may be that these youth are experiencing emotional stimuli more intensely, and at the same time seeking out emotionally charged experiences. Over time this may impact their own emotional state, potentially increasing their risk for internalizing symptoms. Imaginatively, these youth may reexperience emotions more intensely and may spend additional time reflecting on emotional material, causing them to continue reexperience those feelings. This might create a pseudo-rumination that fuels the development of additional symptoms (Jackson & Peterson, 2003).

This has significant implications for how we understand how these youth are at risk. Rather than a dichotomous “at-risk” versus “not at-risk” understanding of internalizing symptoms, the development of internalizing symptoms may be fundamentally different than

with same aged peers. So, a gifted youth may be at risk of developing internalizing symptoms in a given environmental context where their peers may not given the unique way that they are perceiving and interacting with the world. Further, it may not be helpful to understand these youth as at risk at a given time, but at risk across their childhood and adolescence more holistically. Researchers and practitioners can benefit from understanding this so that they do not discount gifted youth as existing in a traditionally protective environment and therefore at less risk, or not at risk because they failed to demonstrate internalizing symptoms when they were younger.

Exploratory analyses seem to suggest that there may be sex differences contributing to the development of symptoms as well. In the *a priori* model, the female group model demonstrated age as a moderately significant predictor of lower anxiety. While not addressed within the current study, understanding the developmental factors in this group that contributed to lower anxiety would be important to understanding how to provide supports across the population as a whole.

The developmental nature of this relationship can also shape how those in the field evaluate risk across the lifespan for these youth. If a contextualist model is accepted, manifested potential can be transient and shifting over time (Dai, 2018). The same can understood of internalizing symptoms; they, too, may shift and change over time. The fact that anxiety and depression were correlated with age seems to suggest this is the case. It is possible that the unique way that gifted youth are interacting with the world has a cumulative effect, causing symptoms to increase over time. From a practical standpoint, this would translate into monitoring the development of these symptoms, or repeated screening, rather than assessing for internalizing distress at a single time point.

## **Implications for Practice**

These results have a number of implications for practice with regard to identification, education, and provision of services. First, it highlights the importance of assessing giftedness in a contextualist way for both research and practice. Identifying gifted youth based on both developmental and manifested potential will lead to greater access to services and enrichment as a whole (Sternberg & Clickenbeard, 1993). Further, assessing youth in this way may mean that children who demonstrate high developmental potential in the context of low manifested potential can be placed into an environment that nurtures their gifts and increases their chances to achieve.

Understanding how developmental potential can impact the development of internalizing symptoms can shape curricula and educational programming. By acknowledging that these youth possess characteristics that put them at developmental risk, teachers and school personnel may incorporate psychosocial education in conjunction with intellectual or academic enrichment. Working directly with these youth to identify emotions, evaluate how their thoughts and perceptions shape how they process emotional information, and build appropriate coping skills may help these youth harness their developmental potential to reduce symptoms rather than contribute to them.

Finally, an understanding of this developmental trajectory can help mental health practitioners better serve these youth. Incorporating a measure of developmental potential can provide insight into how these youth are perceiving or seeking out stimuli that may impact the development of symptoms, or their trajectory in therapy. It can provide an avenue to working with these youth to shape their cognitions and experiences to improve their psychological wellbeing. Additionally, an understanding of the relationship between giftedness

and internalizing symptoms may shape policies regarding screening of gifted youth. As youth become older, it will be important to routinely check-in with them to ensure they are not developing psychological concerns.

### **Limitations**

Although the results are compelling, as with all research, this study is not without limitations. First, the participants recruited into the study were recruited from an academic enrichment program for high achieving youth. This limited the ability to make comparisons to nongifted peers, as it might be expected that a large percentage of the sample was likely gifted in some way given their drive to succeed and seek out challenges (Renzulli & Reis, 2018). Further, it might be expected that gifted youth who are experiencing high levels of anxiety or depression may be avoidant of an activity such as a residential camp that requires staying in an unfamiliar place, trying new experiences, or overall behavioral activation, all characteristics that may be diminished in these conditions (Jackson & Peterson, 2003). Thereby, the current sample may not have gone far enough to fully represent the gifted population as a whole. Despite this, the use of a contextualist approach to assessing giftedness still provided a broader representation than previous studies that used a dichotomous designation of giftedness.

With regard to manifested potential, the measures used were brief screeners selected to reduce the demand on participants. While these screeners have been shown to be effective proxies of academic functioning (Ardoin et al., 2004), they cannot provide the same depth of information that a more comprehensive assessment can provide. Additionally, a measure of intellectual functioning was not administered. Because of this, the assessment of manifested potential may not fully represent the abilities of the participants; however, given the

low amount of variance that the screeners predicted, it is not likely that a more thorough assessment would have produced different results.

Beyond that, even though the present study sought to assess gifted in a more wholistic way, it still did not include all aspects of giftedness outlined in previous theories or the Marland Report (1972). Notably, aspects of giftedness such as creativity and artistic gifts that are important features of gifted youth were not included (Torrance, 1995). In order to fully investigate the effects of gifted traits on internalizing symptoms, it will be important to account for these features in future research.

A key component that was not investigated in the current study was absolute levels of symptomology within the analyses. The study aimed to evaluate if giftedness put youth on an at-risk developmental trajectory, but was not able to speak to whether this trajectory has manifested as higher symptoms than same aged peers. While results suggest that these youth demonstrate developmental characteristics that contribute to the development of internalizing symptoms, these symptoms may not have reached clinically significant levels within the sample. It may be that these youth remain subclinical with regard to internalizing distress; hence previous studies have not identified significantly higher symptoms than peers. This does not discount their developmental risk, but may impact when and where these youth need intervention.

The current study only assessed anxiety and depression, at the expense of other psychological difficulties these youth may face. Given that the developmental potential these youth demonstrate impacts the way they are interacting with the world, it may be that they are manifesting psychological distress in ways other than traditional presentations of anxiety

and depression. Incorporating a broader spectrum of psychological difficulties would provide a more holistic understanding of the challenges these youth face.

Finally, the study relied on self-report measures for both internalizing symptoms and developmental potential. Although validity scales were within normal limits where available, self-report data may have been skewed due to social desirability, underreporting, or overreporting of symptoms. In keeping with these, the reliance on self-report measures for both developmental potential (i.e., overexcitability) and internalizing symptoms increases the likelihood of finding relationships between variables as an artifact of common source/common method bias. The study would have benefited from incorporating collateral information such as parent report to add depth to the assessment.

### **Future research**

The present study provides a contextualist explanation for why some gifted youth appear at more risk of internalizing symptoms. Future research can build on these results by assessing giftedness in contextualist framework more in depth using a more comprehensive assessment of giftedness. This would provide additional information as to the exact contributing factors that drive this relationship.

Additionally, the current study only looked at a small subset of psychosocial problems that these youth may experience. Future research could consider other aspects of psychological functioning, such as externalizing disorders and more severe mental health concerns. It will also be important for future studies to consider individuals that may be considered twice exceptional, such as gifted youth with learning disabilities or high functioning individuals with Autism Spectrum Disorder. It is likely that these populations will present

with unique challenges that warrant specific studies targeting their own developmental trajectories.

Finally, future research should work to include individuals with high developmental potential in the context of low manifested potential. This may include twice exceptional students, such as those mentioned above, or youth who are experiencing problems such as low school engagement, peer or adult conflicts, or severe mental health difficulties interfering with functioning. Understanding how these youth develop psychological distress will be key for developing programming that supports them in reaching their developmental potential.

### **Conclusion**

The results of this study suggest that, while being classified as gifted does not increase risk for internalizing symptoms, traits commonly seen in gifted youth have a direct relationship with internalizing symptoms. Specifically, traits that impact how youth interact with the world, such as emotional and imaginal overexcitabilities, are related to higher internalizing symptoms. This indicates youth high in these traits may be at higher risk of developing internalizing pathology, and highlights the importance of comprehensive assessment and monitoring in this population.

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APPENDIX A

Table 1.

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*Sample means and standard deviations.*

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	Mean	SD
Age (months)	178	19.35
Psychomotor Overexcitability	3.23	0.80
Sensual Overexcitability	3.06	0.90
Imaginational Overexcitability	2.92	0.94
Intellectual Overexcitability	3.67	0.72
Emotional Overexcitability	3.23	0.77
Total Overexcitability	16.08	2.60
Reading	102.34	27.24
Math	109.04	18.17
Anxiety	54.44	12.58
Depression	47.65	9.49

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Table 2.

*Correlations between analyzed variables*

	AGE	POE	SOE	ImOE	IntOE	EOE	TOE	Anxiety	Depression	Reading	Math
AGE	1										
PMOE	0.03	1									
SensOE	0.19**	0.07	1								
ImagOE	0.03	0.01	0.35***	1							
IntOE	0.02	0.20***	0.24***	0.32***	1						
EmoOE	0.15*	0.16**	0.43***	0.34***	0.22***	1					
ToTOE	0.17**	0.55***	0.59***	0.54***	0.50***	0.56***	1				
Anxiety	0.23***	-0.18**	0.07	0.19**	0.08	0.27***	0.07	1			
Depression	0.34***	-0.14*	-0.02	0.12	0.09	0.11	0.05	0.81***	1		
Reading	0.02	-0.11	0.07	-0.05	0.09	0.05	-0.10	0.38***	0.37***	1	
Math	-0.13	0.07	-0.01	-0.11	0.07	0.06	-0.06	0.33***	0.34***	0.72***	1

*Note.* POE=Psychomotor Overexcitability, SOE=Sensual Overexcitability, ImOE=Imaginational Overexcitability, IntOE=Intellectual Overexcitability, EOE=Emotional Overexcitability, TOE=Total Overexcitability. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Table 3.

<i>Group comparisons between GT and NonGT samples</i>				
	GT Mean (SD)	NonGT Mean (SD)	t-statistic	<i>p</i>
Age	173.9 (20.3)	183.2 (17.0)	3.019	0.004
Anxiety	54.7 (13.3)	54.4 (12.0)	0.163	0.871
Depression	46.0 (7.4)	48.6 (8.5)	1.964	0.051
Psychomotor Overexcitability	3.3 (0.8)	3.1 (0.8)	1.686	0.094
Sensual Overexcitability	3.0 (0.9)	3.0 (0.9)	-0.085	0.932
Imaginational Overexcitability	2.9 (1.0)	2.9 (0.9)	-0.244	0.808
Intellectual Overexcitability	3.7 (0.7)	3.6 (0.7)	1.190	0.236
Emotional Overexcitability	3.2 (0.9)	3.2 (0.7)	-0.077	0.939
Reading	104.0 (27.9)	99.1 (25.9)	1.117	0.266
Math	109.4 (16.3)	109.0 (20.7)	0.125	0.901

Table 4.

<i>Summary of multiple regression analyses predicting anxiety and depression</i>			
	$\beta$	<i>t</i>	Sig.
Anxiety Model			
Reading	0.11	1.18	0.241
Math	-0.06	-0.59	0.553
Age	0.07	0.88	0.379
Depression Model			
Reading	0.03	0.86	0.393
Math	-0.09	-1.03	0.305
Age	0.21	2.59	0.011

Table 5.

*Summary of mixed model fit statistics*

	<i>A priori</i> Model	<i>A priori</i> Model Male	<i>A priori</i> Model Female	Exploratory Model	Exploratory Model Male	Exploratory Model Female
$\chi^2$	25.260	24.071	18.200	22.008	24.006	14.768
<i>df</i>	16	16	16	14	14	14
<i>p</i>	0.065	0.088	0.312	0.078	0.046	0.394
CFI	0.905	0.934	0.962	0.957	0.918	0.987
RFI	0.743	0.657	0.563	0.744	0.609	0.594
RMSEA	0.060	0.075	0.046	0.060	0.089	0.029
<i>p</i>	0.322	0.235	0.479	0.332	0.141	0.552

APPENDIX B



Participant Code

### Emotion & Giftedness Study Participant Self-report

Thank you for participating in the measurement portion of the study. This survey is the last part of the study. Your identity will remain anonymous, as will the answers you provide. You may leave any item blank if you do not wish to answer. Please provide the following demographic and background. Please print.

#### Demographic Information

Age \_\_\_\_\_

Grade in school (for next Fall 2014) (circle one) 7 8 9 10 11 12

Gender Male Female

#### Background Information

Are you involved in a gifted and talented program at your school? Yes No

If so, how many years have you been involved: \_\_\_\_\_

Are you taking honors or advanced placement (AP) courses at your school? Yes No

Does your school provide grade point information? Yes No

If so, list your current GPR here: \_\_\_\_\_

*\*Note, please provide data w/ score and scale* → *ex. 3.78 out of 4.00 scale*

Have you taken the SAT or PSAT? Yes No

If so, please list your scores here: Verbal: \_\_\_\_\_

Quantitative: \_\_\_\_\_