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Examining Regulatory and Social Process Traits Associated with Experiences of Shared Decision Making

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Examining Regulatory and Social Process Traits Associated with Experiences of Shared

Decision Making

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Abstract

Decision-making is an important part of healthcare. In recent years, providers have started to use shared decision-making (SDM) with consumers, wherein provider and consumer reach a decision together. Personal characteristics common to Attention-Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD), such as emotion dysregulation, impulsivity, and difficulties with social communication skills may impact SDM. Self-efficacy was hypothesized to mediate this relationship, as it has been described as an integral aspect of SDM. This study utilized a sample of 141 undergraduate college students. We found that emotion regulation predicted confidence in SDM, as well as differences in how individuals with and without neurodevelopmental disorder diagnoses report confidence in SDM. These results indicate that some common characteristics of ADHD and ASD, as well as having a diagnosis, may impact SDM, and suggest the importance of providers facilitating discussions with consumers with neurodevelopmental disorders or who experience emotion dysregulation.

Examining Regulatory and Social Process Traits Associated with Experiences of Shared

Decision Making

The healthcare system has historically relied on professionals making final decisions for

consumers (Waldron et al., 2020). However, in recent years, shared decision making (SDM) has

gained some popularity (Waldron et al., 2020). In SDM, consumers are informed of potential

treatment plans, and make decisions about their healthcare plan alongside their care provider

(Makoul & Clayman, 2006). This research examines whether personal characteristics, such as

emotion regulation and impulsivity, might impact how individuals perceive and feel confidence

in SDM. SDM can greatly impact an individual's health and has been demonstrated to be

effective when used in both mental and primary healthcare (Patel et al., 2008). Individuals often

report higher satisfaction when receiving SDM care for both primary and mental healthcare

(Glass et al., 2017; Hamann et al., 2007). SDM may also impact the quality of decisions made,

resulting in individuals adhering to therapy options or treatment (Bunn et al., 1997) and

medication plans (Fiorillo et al., 2020). Importantly, a meta-analysis has indicated that most

individuals would prefer to engage in collaborative roles with providers, or roles in which the

consumer and provider reach a decision together, similar to the process of SDM (Chewning et

al., 2012). Several studies have reported that ⅔ of consumers prefer to take collaborative roles in

their health care (Chewning et al., 2012; de Las Cuevas & Penate, 2016). In contrast,

approximately 20 to 25% of participants desire passive delegator roles, or roles in which the

provider makes most, if not all, of the decisions (Chewning et al., 2012; de Las Cuevas & Penate,

2016). Yet, even in passive roles, the majority of respondents wish to exchange information with

their provider (Flynn et al., 2006). Additionally, some populations, such as those with

neurodevelopmental disorders, such as Autism Spectrum Disorder (ASD) and Attention-Deficit

Hyperactivity Disorder (ADHD), may be less likely to have opportunities to engage in SDM (Hubner et al., 2016). Therefore, it is important to understand what increases the likelihood of being able to engage in SDM, especially for individuals with deficits in regulatory and social processes that are either consistent with neurodevelopmental disorders or subclinical levels of these disorders. The current study served as a first step to examining potential characteristics, such as emotion regulation, social communication, facets of impulsivity, and self-efficacy, that could impact individuals' confidence in their SDM. Determining if these characteristics impact SDM experiences and to what degree can inform how individuals in a normative population with these characteristics engage with their healthcare providers. The present study also provided information that can be used to examine how individuals with ASD and ADHD diagnoses experience healthcare decision-making, which is currently under researched.

Consumer Characteristics

Despite a desire for SDM, consumers may not always have the ability to engage in SDM. In one study, roughly ⅓ of participants who preferred SDM were not able to engage in it (Murray et al., 2007). This may be due to barriers, such as a lack of time, or due to consumer characteristics (Joseph-Williams et al., 2014). Consumer characteristics range from factors such as socioeconomic status to personal traits (Keij et al., 2021). Consumer characteristics may impact a provider's willingness to engage in SDM with an individual (Légaré et al., 2008) and an individual's ability to confidently engage in SDM with their primary care provider and/or their mental health care providers. Providers have stated they will not engage in SDM if they feel the consumer is not motivated enough or may simply lack the ability to be involved in decision making (Graham et al., 2003). Other barriers cited by providers, in the realm of cancer treatment, have been that consumers are too anxious or emotional to begin the decision-making process

(Charles et al., 2004). Self-efficacy may also impact experiences of SDM (De las Cuevas et al., 2014).

Self-efficacy. Participants seem to be less likely to engage in SDM when they have diminished self-efficacy, as those with lower self-efficacy have reported greatly preferring decisions to be made by their provider (Chawla & Arora, 2013). Self-efficacy is defined as a person's belief in their capability to accomplish goals (Bandura, 1977). General self-efficacy, or a person's overall belief in their ability to succeed across situations, has been applied to healthcare before (Schwarzer & Fuchs, 1996) and has been found to be correlated with SDM, with one study reporting if consumers had a high level of general self-efficacy, they were 20% more likely to prefer SDM (Michaelis et al., 2017). Self-efficacy may impact both the preferences and experiences of SDM within mental healthcare; consumers with high self-efficacy may report experiencing and desiring SDM more than those without high self-efficacy (De las Cuevas et al., 2014).

Consumer self-efficacy is seen as a crucial part of the SDM process for both physical and mental health (Chawla & Arora, 2013; Makoul & Clayman, 2006). The Makoul and Clayman model for SDM includes several components needed for SDM to occur, including self-efficacy or patient ability. Despite this, and qualitative studies reporting self-efficacy is involved in SDM, many measures of SDM often do not include self-efficacy as a component (Bouniols et al., 2016). Yet, self-efficacy has often related to better health outcomes, as individuals may be more likely to seek out better doctors or voice concerns more often (Schoenfeld et al., 2018). Additionally, higher self-efficacy has been connected with wanting more involvement in decision making in health care (Schoenfeld et al., 2018) and to SDM specifically (Chawla et al., 2013; Wigfall & Tanner, 2018) Participants with high self-efficacy have been found to be more

likely to choose autonomous roles, and those with lower self-efficacy are more likely to select

shared roles (Michaelis et al., 2017). Thus, we hypothesized self-efficacy would serve as a

predictor of one's confidence in decision-making while using SDM.

Shared characteristics. SDM experiences may also be impacted by other characteristics,

including emotional regulation, social communication, and facets of impulsivity (Joseph-

Williams et al., 2014; Keij et al., 2021). These characteristics may also be associated with

diminished self-efficacy (Salavera et al., 2017; Usán Supervía & Quílez Robres, 2021;

Wainwright et al., 2022), which may serve as an important mechanism in connecting consumer

characteristics (e.g., emotion regulation) to confidence in SDM. Difficulties in these domains are

common among individuals with neurodevelopmental disorders. Neurodevelopmental disorders

are disorders that impact the development of the nervous system, including conditions such as

ADHD and ASD (England-Mason, 2020; Mayes et al. 2011; Morris-Rosendahl & Crocq, 2020;

Panagiotidi et al., 2019). While ASD and ADHD are distinct diagnoses, they do share some

similar characteristics that may impact one's ability to engage in SDM. Characteristics

underpinning adults with ASD and ADHD include emotional regulation difficulties, social

communication difficulties, and facets of impulsivity (England-Mason, 2020; Mayes et al. 2012;

Panagiotidi et al., 2019). Additionally, broader executive functioning difficulties, such as poor

planning, may also impact SDM experiences. The gradient overarching disorder theory posits

that ADHD and ASD may be different versions of one larger disorder (van der Meer et al.,

2012). Indeed, ADHD and ASD share common symptoms, with one study reporting that ADHD

symptoms are common to people with ASD (Mayes et al., 2012). Given the potential importance

of consumer characteristics, this study examined the impact of these underlying core

characteristics common to ASD and ADHD on confidence in decision-making in SDM within primary care and mental health care in a normative sample.

A key reason to consider these shared characteristics in a non-clinical sample is that while individuals diagnosed with ASD and ADHD experience these traits, these disorders exist on a continuum. Individuals not diagnosed with ASD may experience the broad autism phenotype (BAP), experiencing some difficulties in social communication or behaviors (Gerdts & Bernier, 2011). Individuals may also experience subclinical levels of ADHD, experiencing some inattentive symptoms (Overbey et al., 2011). Furthermore, the lack of a diagnosis does not always indicate an individual does not have a disorder. Some individuals with ADHD are often undiagnosed well into adulthood, while many women and people of color (POC) remain undiagnosed with ASD (Able et al., 2007; Diemer et al., 2022). Again, this study served as an important first step to identifying shared core characteristics of ADHD and ASD, such as emotion regulation, impulsivity, and social communication, within a normative population. This can help us understand how these characteristics may affect SDM outside of those who have a diagnosis, such as those that are undiagnosed or simply share the phenotype and provide important preliminary information on how these core neurodevelopmental disorder characteristics can potentially affect SDM among those with diagnoses.

There is also limited research examining the use of SDM among those with ADHD and ASD, with most studies looking at the experiences of parents of children with these conditions (Lipstein et al., 2016; Mule et al., 2021). Generally, it appears that the families of youth with ASD experience diminished levels of SDM when working with providers (Mule et al., 2021). Families of youth with ADHD have also reported diminished experiences of SDM (Lipstein et al., 2016). It is not yet known how adults with ADHD and ASD report their SDM experiences.

Because of this lack of research, we felt examining core characteristics on a continuum over diagnoses would serve as an important preliminary study in the field. Studying these traits first in a normative sample can help further our understanding of how critical features of these disorders may impact SDM experiences and ultimately assist in potentially understanding barriers to SDM experienced by people with ASD and ADHD.

While there is limited research examining connections between ASD/ADHD characteristics and SDM, there is more substantial research examining these shared characteristics and self-efficacy. Generally, self-efficacy and self-esteem are often diminished among individuals with ASD and ADHD (Newark et al., 2016; Nguyen et al., 2020). Adults with ADHD have reported lower levels of self-efficacy than individuals without ADHD (Newark et al., 2016), while higher ASD characteristics, including factors such as social difficulties, have also correlated with diminished levels of self-efficacy as well (Buckley et al., 2021). One theory that may explain why individuals high in ASD and ADHD characteristics often struggle with self-efficacy is Bandura's Theory of Self-Efficacy (1977). According to this theory, general self-efficacy is influenced by the difficulty of a task, the person's confidence in their ability to complete the task, and how much the task generalizes to other experiences (Chen et al., 2001). For example, an individual may have higher self-efficacy when engaging in an SDM experience due to prior experiences of SDM that went successfully. Most crucially, shared ASD/ADHD characteristics may impact SDM experiences individually and through the mechanism of self-efficacy, as displayed in Figure 1. We would expect that individuals experiencing these characteristics would also experience lower levels of self-efficacy. Furthermore, individuals reporting more significant levels of these ADHD/ASD characteristics would also report lower levels of self-efficacy than those reporting less significant levels of those same characteristics.

We therefore hypothesized that adults higher in characteristics typical in ADHD and ASD, such as poor social communication, urgency, low conscientiousness, and low emotional regulation, will report diminished self-efficacy and experiences of SDM. Many of these characteristics impact factors related to SDM, such as decision-making abilities, cognitive effort, or decreased effort in life (Fortgang & Cannon, 2022; Heilman et al., 2010; Sperry et al., 2016). Others are integral to the SDM experience, such as being able to manage emotions (Keij et al., 2021).

How are common ADHD/ASD characteristics related to SDM and Self-Efficacy?

Emotion regulation. Emotional regulation is defined as the process of how someone changes their emotional experience or expression (Gross et al., 2002). Emotion regulation was chosen as it is experienced by both individuals with ASD and ADHD, and it is important to SDM and self-efficacy. Less effective emotion regulation is a potential barrier to SDM. Emotion regulation is a crucial factor within decision-making, especially in situations with high risk (Heilman et al., 2010). An inability to regulate emotions or engage in regulation strategies have been associated with riskier decision-making (Martin & Delgado et al., 2011). However, the role of emotions within making healthcare decisions is still under-researched (Ferrer & Mendes, 2017). Healthcare decisions may be ladened with emotion, as the process of obtaining a diagnosis or decision to start treatment may be emotionally taxing (Ferrer & Mendes, 2017). Emotions may either be incidental (i.e., independently experienced from situations) or integral (i.e., induced by situations; Treffers & Putora, 2020). Consumers may also be impacted by emotions they are currently experiencing, or emotions they anticipate they will experience after the decision (i.e., anticipatory emotions; Treffers & Putora, 2020). It is therefore expected that individuals who cannot regulate their emotions may be unable to effectively engage in SDM, as they may be too

distracted by the emotions they are experiencing. An inability to effectively emotionally regulate may therefore act as a barrier, preventing people in a normative sample from engaging in SDM.

Emotional dysregulation may also serve as a barrier for individuals with diagnosed ASD and ADHD (England-Mason, 2020). Nearly 75% of adults with ADHD report difficulties in emotional regulation (Retz et al., 2012). These difficulties with emotion regulation also occur in the ADHD population beyond just comorbid disorders (Bodalski et al., 2019; Christiansen et al., 2019). Furthermore, adults with ASD often report higher levels of alexithymia and depression than adults without ASD (Berthoz & Hill, 2005). Alexithymia refers to difficulties with both verbal and nonverbal communication in expressing one's emotional states to others (Kinnaird et al., 2019). Experiences of alexithymia affect one's ability to identify their emotional states, which can lead to poorer emotional understanding. It has also been associated with poor emotion regulation (Krvavac & Jansson, 2021). We would expect that individuals who report more severe difficulties with emotion regulation, similar to levels experienced by those diagnosed with ADHD or ASD, would report more difficulties with their SDM experiences.

These difficulties may become especially salient when receiving mental healthcare. The process of receiving a diagnosis of ADHD for adults, or attempting to receive a diagnosis, is laden with emotions such as anxiety, stress, depression, and relief (Young et al., 2004). Similarly, adults diagnosed with ASD also report similar emotions upon learning of an ASD diagnosis in adults (Leedham et al., 2020). Furthermore, these stressors also affect individuals without a diagnosis of ASD or ADHD, as receiving a diagnosis in physical healthcare can also be stressful, which can impact one's ability to engage in SDM (Treffers & Putora, 2020).

Emotional regulation may also impact the affective state of a consumer, and therefore affect their self-efficacy to engage in SDM. Experiences of decision making in physical and

mental health care are often emotionally charged, with individuals needing to make decisions about starting treatment or medication (Treffers & Putora, 2020). Emotional regulation has been found to predict self-efficacy for academic performance, as well as some specific types of self-efficacy, such as self-control (Usán Supervía & Quílez Robres, 2021). Therefore, emotional regulation may also predict emotional self-efficacy (Maddy et al., 2015; Wang et al., 2015).

Using Bandura's theory, emotional regulation may impact self-efficacy through monitoring one's physiological states (Bandura, 1977). According to this theory, as well as previous research (Usán Supervía & Quílez Robres, 2021; Wang et al., 2015), we would also expect someone with greater emotional regulation skills to have greater capacity for higher self-efficacy than someone with poorer emotional regulation capacity. Practicing strong emotional regulation strategies has been correlated with higher levels of subjective well-being, positive affect, and self-esteem, a concept closely related to self-efficacy (Nezlek & Kuppens, 2008). If an individual uses positive emotional regulation practices, they may have higher self-efficacy to engage in SDM experiences.

We hypothesized emotional regulation, as a shared characteristic of both ADHD and ASD, would impact one's confidence regarding decisions made using SDM. We predict that individuals experiencing more severe deficits in emotion regulation strategies will report less confidence in SDM than those who can effectively regulate during stressful experiences or have less severe deficits in these abilities. Findings from this study will help to better understand how emotion regulation abilities affect SDM experiences in a typical population, but it will also help us understand how individuals with ASD and ADHD may engage with SDM. As ASD and ADHD are associated with poorer emotional regulation strategies, normative individuals who utilize less effective emotional regulation strategies will help provide us insight into the ASD and

ADHD population. Furthermore, we hypothesized emotional regulation would be associated with general self-efficacy.

Social Communication. Deficits in social communication may impact confidence in decisions made using SDM. Social communication was chosen as it is a common concern to both ASD and ADHD, and social communication deficits serve as a barrier to SDM and self-efficacy. Social communication itself is composed of different aspects. Specifically, according to Riggio et al.'s (2005) framework, social communication consists of expressivity skills, skill over regulation, and control over the conversation itself. It consists of both verbal and nonverbal skills (Riggio et al., 2005). In studies examining communication usage in SDM, the focus centers on verbal skills during the provider-consumer conversation (Charles et al., 1997; Makoul & Clayman, 2006). To engage in SDM, consumers and physicians alike must bring up potential concerns, share information, and discuss values (Makoul & Clayman, 2006).

Deficits in social communication skills can act as a barrier to SDM for consumers. Consumers may be less likely to bring up questions or try to clarify information as a result of poor communication skills (Cegala, 2003). At the same time, providers may not be well-trained in effective communication with their patients, inadequately conveying diagnosis or risk (Moore et al., 2018). Patient-centered communication has also only recently been popularized; providers may still use jargon unfamiliar to the individual seeking care (Hironaka & Paasche-Orlow, 2013). Effective communication is one of the integral tenets of SDM, and a consumer's ability to engage in it can impact their treatment (Muscat et al., 2019). Therefore, an individual with poor social communication will likely not experience as much SDM as an individual with better social communication skills.

Individuals with ADHD and ASD often also struggle with multiple domains of social communication (Robbins, 2005; Tehrani-Doost et al., 2019). Higher ADHD symptom severity may be correlated with deficits in social communication, a symptom shared with ASD (Panagiotidi et al., 2019). Both individuals with ASD and those with ADHD also struggle with nonverbal communication, and so may be unable to detect changes in facial expression or tone (Sato et al., 2017; Tehrani-Doost et al., 2019). However, there may be some differences in how these deficits present themselves respective to each condition. As mentioned previously, individuals with ASD often struggle with alexithymia (Kinnaird et al., 2019). Individuals with ADHD struggle with reactivity in communication with their providers, which may amplify their emotional responses (Robbins, 2005). Like emotional regulation, we expect that social communication abilities will vary among individuals. We predict individuals who report poorer communication skills, akin to difficulties often experienced by individuals diagnosed with ADHD and ASD, will report diminished SDM experiences. We expect that these communication skills will vary among the population as well, with some normative individuals reporting better communication skills than other normative individuals.

Past studies have indicated social communication may influence different types of self-efficacy (Riggio et al., 2019; Salavera et al., 2017). Salavera et al. (2017) reported that higher levels of social communication correlated with higher levels of self-efficacy among high-school students for schoolwork. Another study indicated better communication skills predicted higher social self-esteem, a concept highly related to self-efficacy (Riggio et al., 1990). We would expect that a person who has stronger social communication would have higher self-efficacy when faced with a choice to engage in SDM. For example, people who have better communication skills may be more likely to ask for help from their provider with navigating a

novel situation, or to seek help from friends or family. This would be consistent with Bandura's theory, as by engaging in help-seeking behaviors individuals may be able to build their self-efficacy through encouragement. One prior study indicated that social competency skills had an indirect effect on help-seeking in students (Ryan & Pintrich, 1989). An individual having impaired communication skills may therefore be less able to effectively ask for help from others, and not gain mastery experiences.

Importantly, we would expect diminished levels of verbal communication skills, common to ASD and ADHD, to correlate with diminished confidence in decision-making during SDM. Specifically, we hypothesize that individuals who struggle more with communication will have more difficulty engaging in SDM, as poor communication abilities serve as a barrier. These difficulties to engage in SDM will increase alongside the severity of these communication difficulties. Because difficulties in social communication are common to ASD and ADHD, examining how normative individuals with poor communication abilities experience SDM may provide information on how non-normative individuals do. It will also provide us with information on how normative individuals with poor communication skills experience SDM. We finally hypothesize verbal communication will be associated with self-efficacy, as individuals with better communication may be better able to accomplish a goal of seeking help due to stronger communication skills.

Facets of Impulsivity. Impulsivity is currently defined in the literature as any trait that leads to rash responses (McCarty et al., 2017). Because it has multiple concepts, different aspects of impulsivity have been examined (Evenden, 1999). The Urgency-Premeditation-Perseverance-Sensation Seeking-Positive Urgency impulsivity scale (UPPS-P), for example, identifies impulsivity as including five constructs; positive and negative urgency, lack of premeditation,

lack of perseverance, and sensation seeking (Lynam et al., 2007). We will be examining two overarching factors of impulsivity: urgency and low conscientiousness, given their relevancy for self-efficacy and SDM. Urgency refers to an individual's tendency to make rash decisions when feeling positive or negative emotions, while low conscientiousness is composed of a lack of perseverance and a lack of premeditation (Dugré et al., 2019). We hypothesizes that both of these will serve as a barrier to experiencing SDM.

Urgency, specifically negative urgency, has been found to correlate with poor decision-making in studies using gambling tasks, as has lack of premeditation (Kräplin et al., 2014; Zermatten et al., 2005). Furthermore, both urgency and lack of premeditation have correlated with a lack of confidence, and difficulty concentrating (Sperry et al., 2016). While lack of perseverance has not shown correlations to decision-making abilities, past research has found that lower perseverance is correlated with lower cognitive effort scores (Fortgang & Cannon, 2022), and has also correlated with decreased effort in activities in life (Sperry et al., 2016). Individuals with lower perseverance could also show decreased efforts to engage in SDM or their own care as well. Therefore, an individual reporting higher levels of impulsivity may face more difficulties to engage in SDM that individuals with lower levels of impulsivity may not experience. Thus, impulsivity may be a potential barrier to SDM.

Both urgency and low conscientiousness are characteristics commonly associated with both ASD and ADHD. Impulsivity is one of three core features of the ADHD phenotype, alongside hyperactivity and attention deficits (Mayes et al., 2012). According to the overarching disorder theory, the ADHD symptom of impulsivity is found within ASD as well (Mayes et al., 2013). Adults with ADHD tend to score higher on facets of urgency, and lower conscientiousness (Gomez & Watson, 2023). Adults higher in ASD characteristics have also

been shown to score higher on negative urgency and lack of perseverance, using the original

four-factor model (Mason et al., 2021). As reported by Mason et al. (2021), even individuals

without an official diagnosis of ASD who are demonstrating subclinical symptoms may also

display increases in impulsivity. We would expect adults showcasing subclinical ADHD

symptoms would also show some increases in their impulsivity. Overall, we expect that

individuals reporting more severe difficulties, like those reported by individuals with a diagnosis

of ADHD or ASD, will report more difficulties with SDM.

Impulsivity has been shown to be associated with self-efficacy (Kadden & Litt, 2012;

Rike et al., 2015). Low conscientiousness may impact self-efficacy through the formation of

mastery experiences (Bandura, 1977). Someone who has low conscientiousness may display a

lack of premeditation and make a rash decision before considering all the options available

(Martin & Potts, 2009). This may then result in a failed instance of SDM, which will impact their

self-efficacy by preventing them from forming mastery experiences. Furthermore, someone may

also display a lack of perseverance for persisting with aspects of SDM, such as bringing up

concerns or trying to find a new doctor who does follow SDM. Past studies have shown that

individuals who can maintain perseverance are more successful in different fields, such as school

or work (Hwang et al., 2018; Littman-Ovadia & Lavy, 2020). This would also lead to a lack of

mastery experiences and prevent self-efficacy from forming.

Urgency has been found to be a predictor of drinking-refusal self-efficacy (Stevens et al.,

2016), and has also shown strong correlations to self-efficacy overall (Petker et al., 2021).

Following Bandura's theory, urgency may also affect physiological states when engaging in

SDM. Patients may be especially prone to making poor decisions if they are high in negative

urgency (Cyders & Smith, 2008). As with emotional regulation, this may prevent someone from building their self-efficacy.

We hypothesize that individuals higher in urgency and low conscientiousness will report diminished confidence in decision-making using SDM. Impulsivity, a multi-faceted concept, may serve as a barrier to SDM in a variety of ways. For example, individuals higher in urgency may act more rashly when faced with SDM or may be perceived by their provider as acting too impulsively when distressed. At the same time, individuals low in perseverance may not be able to engage in the cognitive effort to start the SDM process. Like with emotional regulation and social communication, those reporting more impulsive behaviors will report more difficulties with SDM. Examining a normative sample on a continuum of impulsivity will help to inform the spectrum of how individuals with ASD and ADHD, who commonly report impulsive behaviors, experience SDM. It will also help inform us of how impulsivity affects how typically developing individuals may experience SDM. We also expect urgency and low conscientiousness to be associated with self-efficacy. Low conscientiousness may impact someone's ability to engage in mastery experiences, while urgency can impact physiological states.

Current Study

We hypothesized that ASD and ADHD characteristics, including emotional dysregulation, poor social communication, high urgency, and low conscientiousness, will serve as barriers to positive SDM experiences. While these characteristics are common to both individuals with ASD and ADHD, these characteristics also exist outside of these disorders, and therefore may also affect the SDM experiences of a normative population. However, these characteristics are most salient among individuals with these disorders. This study therefore served as a first step into examining how these characteristics may affect SDM experiences in a

typically developing population, which can then be used to provide more information on how people with ASD and ADHD may experience healthcare decision-making. Finally, we hypothesized that self-efficacy will serve as a mediator to explain how these characteristics impact experiences of SDM, as individuals with a low self-efficacy will be less likely to attempt to engage in SDM or seek providers who do use SDM.

Covariates. There are two covariates the study additionally considered. Generally, race is known to affect experiences of SDM (Lin & Kressin, 2015; Peek et al., 2010). Ethnic minorities have reported receiving less information when receiving care than White consumers (Peek et al., 2010). One past study indicated that disparities in SDM between Black and White families are no longer significant when adjusting for covariates of the child's age and gender, their health needs, and daily activity limitations (Jolles et al., 2018). Gender may also impact decision-making styles, although research is more limited in the field of SDM (Adisso et al., 2020). One study indicated that women preferred more involvement in SDM than men did, who preferred their doctor to make decisions (Perkins et al., 2019). Gender may also affect communication styles; women tend to be more emotionally expressive and polite, while men are more assertive (Barnett et al., 2021). Therefore, the role of race and gender were included as covariates in our mediation model. Given that the shared characteristics were chosen given their relevance for those with ADHD and ASD, we also examined how well the proposed shared characteristics associated with reported ASD and ADHD symptoms. In supplemental analyses, we also explored how the hypothesized mediation model differed with the inclusion of ADHD and ASD symptoms as covariates to determine the contribution of the shared characteristics above and beyond the contribution of symptomatology and also explored how those with a self-reported diagnosis of ADHD and/or ASD differed on the main study variables.

Method

Participants

The sample consisted of undergraduate students at Rochester Institute of Technology. We initially received 235 respondents to the survey. Incomplete responses, those who failed any attention check, those who completed the survey in under 15 minutes, and those who either gave no responses or poor responses to short answer prompts (such as one-word responses), were removed from the analysis. The remaining sample was comprised of 141 participants with valid responses. The average age of participants was 19.4 years ($SD = 1.4$), 48.5% were female, 73.2% were white, and 96.4% were hearing (see Table 1). The sample was thus relatively representative of the RIT undergraduate student body from which the sample was derived. RIT is a large private university that is roughly 66.5% male, and 33.5% female. The full-time undergraduate population is predominantly White (65.3%; Institute of Education Sciences, 2022). RIT is also home to a large population of students who are deaf or hard of hearing, with roughly 6% of the population attending NTID (Institute of Education Sciences, 2022). Regarding diagnoses, 15.5% of the sample indicated they had a mental health condition, 20.6% indicated they had a neurodevelopmental disorder, and 19.1% of the sample indicated they had a physical health condition. Of the 20.6% of respondents who reported a neurodevelopmental disorder, 25 participants reported either an ASD and/or ADHD diagnosis. In a typical student population, approximately 5.6% of the study body report a diagnosis of ADHD, while anywhere between 0.7 and 1.9% of college students report a diagnosis of autism (Hotez et al., 2022; White et al., 2011). Participants were recruited using flyers, as well as made aware of the study through the Department of Psychology's Research Participation System. Participants completed this survey

for credit. Participants were 18 years of age or older, and the only exclusion criteria were ability

to speak and read English, as the measures are in English.

Measures

   Urgency and Low Conscientiousness. Urgency and low conscientiousness were

measured using the Urgency-Premeditation-Perseverance-Sensation Seeking-Positive Urgency

Scale, or the UPPS-P (Lynam, Smith, Cyders, Fischer, & Whiteside, 2007). The UPPS-P is a

self-report measure of impulsivity which assesses five facets of impulsivity, including negative

urgency, lack of premeditation, lack of perseverance, and positive urgency. The UPPS-P consists

of 59 items measured on a 4-point Likert scale (*Agree strongly, agree some, disagree, and*

disagree strongly). A sample item from the lack of premeditation subscale that is reverse-coded

is "I usually make up my mind through careful reasoning." A sample item from the lack of

perseverance subscale is, "Unfinished tasks really bother me." A sample item from the negative

urgency subscale is "When I am upset, I often act without thinking." A sample item from the

positive urgency subscale is "I tend to act without thinking when I am really excited." The

UPPS-P is a reliable and valid measure, having been translated into several languages (Fossati et

al., 2016; Verdejo-Garcia et al., 2009). The UPPS-P has shown high internal consistency as well

as good construct validity (Bousardt et al., 2018).

   We used the subscales of negative and positive urgency, as well as lack of perseverance

and premeditation. The subscales of negative urgency and lack of premeditation have both been

previously shown to correlate with poor decision-making or cognitive effort (Fortgang &

Cannon, 2022; Kräplin et al., 2014). Based on previous research, positive and negative urgency

scales were composite created into a larger scale of urgency, while lack of premeditation and

perseverance were combined into low conscientiousness (Billieux et al., 2012; Cyders et al.,

2014; Dugré et al., 2019). A three-factor hierarchal model including urgency, low

conscientiousness, and sensation seeking has shown good fit of the data (Billieux et al., 2012;

Dugré et al., 2019). Sensation seeking has not previously shown correlations with decision-

making or cognitive effort, so it was not included. Positive and negative urgency generally show

moderate to high correlations, with one study reporting a correlation of roughly .57. (Cyders,

2013). Lack of perseverance and premeditation has also shown a moderate correlation (e.g., r =

0.49; Cyders, 2013). In our study, positive urgency and negative urgency had a correlation of .72

($p < 0.01$), while lack of perseverance and premeditation had a correlation of .81 ($p < 0.01$). For

our study, the urgency subscale of the UPPS-P had a Cronbach's Alpha of .95 with 26 items, and

the low-conscientiousness subscale of the UPPS-P had a Cronbach's Alpha of .83 with 21 items.

Emotional Regulation. Emotional regulation was measured using the Difficulties in

Emotion Regulation Scale, or DERS (Gratz & Roemer, 2004). The DERS scale consists of six

subscales, measuring nonacceptance of emotional responses, difficulty engaging in goal-directed

behavior, impulse control, lack of emotional awareness, access to emotion regulation strategies,

and lack of emotional clarity. There are 36 self-report items ranked on a 5-point Likert scale

(*Almost never, sometimes, about half of the time, most of the time, almost always*). A sample

question is "When I'm upset, I become out of control." (Gratz & Roemer, 2004). We used the

total score of the DERS to represent emotional regulation, excluding lack of emotional

awareness, as it has shown poor consistency with other subscales and has shown to be a poor

predictor (Hallion et al., 2018; Jennissen et al., 2016). The DERS has generally shown internal

consistency across studies (Gratz & Roemer, 2004; Jennissen et al., 2016), and has shown good

test-retest reliability and convergent validity (Bjureberg et al., 2015). The Cronbach's Alpha for

the DERS total score scale in this sample was 0.94. Higher scores indicate greater emotion dysregulation.

Social Communication. Social communication was assessed using the Abridged Social Skills Inventory, or ASSI (Oldmeadow et al., 2013). The ASSI is based off of Riggio's original Social Skills Inventory (SSI, Riggio, 1986). Researchers selected the four highest loading items from each subscale of the original SSI. The ASSI measures both emotional and verbal communication as well as verbal and emotional skills related to social competence. We used the subscales associated with verbal communication: social expressivity, social sensitivity, and social control. We created a combined measure of verbal communication using an average of scores from these measures, as has been done in a prior study (Moeller & Seehuus, 2019).

In the ASSI, there are 24 self-report items measured on a 5-point Likert scale (*Not at all like me, a little like me, like me, very much like me, and extremely like me).* A sample item from the social expressivity subscale is, "I love to socialize." A sample item from the social sensitivity subscale is "I'm generally concerned about the impression I'm making on others." A sample item from the social control subscale is "I am very good at leading group discussions." The ASSI has high reliability, with Cronbach's alphas for the verbal subscales all being well above .8 (Oldmeadow et al., 2013). The original ASSI also displays high validity and reliability, with good convergent validity with other scales measuring social communication (Riggio et al., 2005). The Cronbach's Alpha of the verbal communication subscale for our study was 0.83, although one item was not included in the analysis due to being mistakenly excluded from the online study.

Self-Efficacy. Self-efficacy was assessed using the New General Self-Efficacy Scale (NGSE; Chen et al., 2001). The NGSE measures an individual's overall self-efficacy. There are

8 items scored on a 5-point Likert scale (*strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree*). A sample item is, "I will be able to achieve most of the goals that I have set for myself." The NGSE has high reliability, with Cronbach's alpha scores ranging from .85 to .90 (Henson, 2001). The Cronbach's Alpha of the NGSE for our study was 0.93. The NGSE has also outperformed other measures of general self-efficacy on item discrimination and item information (Scherbaum et al., 2006).

SDM. SDM was assessed using the Combined Outcome Risk Measure for Risk Communication and Treatment Decision-Making Effectiveness (COMRADE; Edwards et al., 2003). COMRADE consists of two subscales which measure an individual's confidence in their decision-making for both physical and mental health care settings, as well as their own and their provider's perceived communication regarding a medical decision. It is a 20 item 5-point Likert scale (*strongly disagree to strongly agree*). A sample item from the confidence in decision-making subscale is, "I know the advantages of treatment and not having treatment." The COMRADE scale has shown efficacy for individuals seeking both primary care and mental health services (Edwards et al., 2003; Pérez-Revuelta et al., 2018), and a high internal consistency of roughly 0.92. Most importantly, for measure development, patients were central to identifying themes they felt were important to decision-making (Edwards et al., 2003). We used the confidence in decision-making section of the COMRADE scale, which has been done in previous research (Burton et al., 2010). We focused on this subscale as the two sections have low correlations with each other ($r = 0.04$, as reported by Edwards et al. 2003), as they measure two different aspects of the decision-making process. Additionally, this subscale focuses on the consumer confidence in the decision itself, and not provider communication during the SDM process.

In our study, we assessed confidence in SDM between overall healthcare experiences, as well as in specific healthcare experiences. To do this, we created two versions of the COMRADE Scale, one focusing on overall healthcare experiences, and one focusing on a specific healthcare experience. For the overall COMRADE Scale, we altered the introductory wording to focus on healthcare experiences throughout one's life. We specifically instructed participants to think about their cumulative experiences with healthcare decision-making throughout their life. We specified that these experiences could focus on overall experiences with mental or physical health providers. For the specific COMRADE Scale, we altered the introductory wording to focus on healthcare experiences during a specific past instance. For this question, we specifically instructed participants to think about healthcare decision-making for a specific experience, such as a single visit to a healthcare provider. Before each scale, we asked participants to write two to three sentences about their overall experiences with healthcare decision-making, and a specific experience with healthcare decision-making. This was added to help facilitate memories of healthcare experiences. These narratives were then thematically reviewed.

We changed the wording of all questions for both scales. For example, one question on the COMRADE is 'The doctor gave enough *explanation* of the information about the treatment choices.' For the overall COMRADE scale, we changed this to 'Overall, health professionals have given me enough *explanations* of the information about treatment choices.' For the specific COMRADE Scale, we changed this to 'The health professional gave enough *explanation* of the information about treatment choices.'

We sought to assess both overall experiences and specific experiences given that overall experiences are generally not examined within SDM studies. Most constructs examining SDM

experiences focus on specific decisions or interactions for a specific healthcare concern, such as the Satisfaction with Decision Scale, or the Rochester Participatory Decision-Making Scale (Holmes-Rovner et al., 1996; Shields et al., 2005). We combined both overall and specific confidence in SDM, obtaining a Cronbach's Alpha score of .96 with 20 items.

As mentioned, to facilitate recall of decision-making experiences, we also asked participants to describe the experiences they were responding to the questions about and examined themes within each healthcare narrative, for both overall and specific scenarios. Research assistants were trained on coding healthcare narratives and were instructed to determine the context of the described experience, as either mental healthcare, physical healthcare, scenarios that included both, or were coded as uncertain or vague for scenarios that did mention which type of healthcare was received. When recalling both overall and specific healthcare, participants tended to reference physical healthcare scenarios, such as a check-up or for getting a shot. 45.4% of respondents were clearly referring to physical healthcare when asked about overall experiences, while 73% of respondents were referring to physical healthcare in specific experiences. Notably, most participants who referred to physical or mental healthcare when asked about overall experiences stayed with that field when discussing specific experiences (see Table 2).

ADHD Symptoms. We utilized the ADHD Self-Report Scale (ASRS) to examine how much the above characteristics cohere with actual ADHD symptomatology (Kessler et al., 2005). The ASRS is an 18 item 5-point Likert scale (*never, rarely, sometimes, often, very* often) which assesses the presence and severity of ADHD symptoms within adults. The ASRS has two subscales, with the first assessing ADHD symptoms, and the second assessing for related symptoms of ADHD. The ASRS is a valid and reliable self-report measure, with the ASRS

showing high internal consistency (0.88) and high concurrent validity with other ADHD self-report measures (Adler et al., 2006). We utilized Part B of the ASRS, which measures symptom severity and the degree to which they impact the participant's life. The Cronbach's Alpha of Part B of the ADHD Symptoms for our study was 0.84.

ASD Symptoms. Similarly to the ASRS, we utilized the Autism Spectrum Quotient (AQ) to assess how well these characteristics cohere with autistic symptomatology (Baron-Cohen et al., 2001). The AQ was developed to assess the level of autistic traits in individuals older than 16. There are five subscales of the AQ, comprised of communication, social, imagination, local details, and attention switching. The AQ utilizes a 50 item 4-point Likert scale (*definitely agree, slightly agree, slightly disagree, definitely disagree*). Similar to the ASRS, the AQ is valid and reliable, reporting a higher Cronbach's alpha (0.71 in the general population), with higher AQ being more common to patients reporting a diagnosis of autism (Hoekstra et al., 2008). The Cronbach's Alpha of ASD symptoms for our study was 0.77.

Procedures

The study was conducted online, using Qualtrics. Participants first gave informed consent after reviewing information about the study. Consistent with APA guidelines for informed consent, participants were informed of the study and expected duration, were made aware that they can withdraw at any time, were made aware of any foreseeable risks or research benefits, were informed of the limits of confidentiality, and were given information on who to contact if needed (American Psychological Association, 2017). After giving consent, participants moved on to the study. Each participant first completed measures of demographic information, impulsivity, social communication, emotional regulation, self-efficacy, and then measures of SDM.

Data Analysis Plan

Data analysis was largely conducted in IBM SPSS version 28.0.0, barring some analysis

in R. Mediation analysis was conducted using the Hayes Process Macro. Past studies were

reviewed for as many of the model paths as were available to assist in determining the

appropriate sample size for proposed study (Bayard et al., 2011; De Las Cuevas et al., 2014;

Ekdahl et al., 2011; Fernandes et al., 2022; Fortgang & Cannon, 2022; Fukui et al., 2014;

Kräplin et al., 2014; Malesza, 2019; Palmer et al., 2013; Salavera et al., 2017; Sperry et al., 2016;

Stevens et al., 2016; Usán Supervía & Quílez Robres, 2021; Verwijmeren & Grootens, 2018;

Werner et al., 2009; Wigfall & Tanner, 2018). Based on these effect sizes and the use of a G

Power linear regression analysis assuming a small effect size, we determined that the appropriate

sample size was 159 (Faul et al., 2007) and achieved a sample of 141 participants with complete,

valid data.

Our analytic plan consisted of the following steps: missing data analysis, normality

checks, descriptive analysis, correlational analysis, mediation analysis, an exploratory ANOVA,

and supplementary analyses. The first step in our analysis plan was reviewing missing data from

all outcome variables. Only one outcome variable had a missing rate higher than 5%, which was

emotion regulation, with 6.4% of data missing. Because this variable had a missing rate higher

than 5%, we checked if there were any significant differences on any of the outcome variables

between participants missing on these two variables or not. We found a significant difference

between those missing values on emotion regulation and their confidence in SDM, with a one-

sided p value of .016. We explored the missingness on this variable in the mediation model, and

it did not impact any significant pathways. Little's MCAR test in R using the naniar package also

supported that the any missing data among the outcomes of interest was supported as missing at

random, as the p value was well above 0.05 (0.99).

We then assessed the normality of the sample. To assess normality, we conducted a

Shapiro-Wilkes Test, and reviewed histograms, boxplots, and Q-Q plots for each variable of

interest. Notably, ADHD Symptoms, Confidence in SDM, Urgency, Self-Efficacy, and Social

Communication all showed non-normal distributions and failed a Shapiro-Wilkes test. However,

we further examined the skewness and kurtosis of each of these variables, given that all of these

are important to the model. We determined all skewness and kurtosis levels were within

acceptable limits, as all skewness and kurtosis levels were between -2 and +2 (George &

Mallery, 2010). We also checked for multicollinearity using the variance inflation factor (VIF),

but all VIF scores were well below 5.

<div align="center">**Results**</div>

Descriptive Statistics

Supporting our hypothesis that these characteristics are related to ADHD and ASD,

urgency ($r = .28$, $p = .001$) and poor emotion regulation ($r = .5$, $p <.001$) were both positively

associated with ASD symptoms. Similarly, emotion dysregulation ($r = .55$, $p <.001$), urgency ($r

= .45$, $p < .001$) and low conscientiousness ($r = .31$, $p < .01$) all positively associated with ADHD

symptoms. Notably, social communication was not associated with ASD symptoms, and was

positively associated with ADHD Symptoms ($r = .35$, $p <.001$). ADHD symptoms were also

negatively associated with confidence in SDM ($r = -.32$, $p < .001$), while ASD symptom scores

was also significantly negatively associated with confidence in SDM ($r = -.27$, $p = .002$). We

also found that emotion regulation ($r = -.214$, $p = .014$) and low conscientiousness ($r = -.25$, $p =

.003$) were both negatively correlated with confidence in SDM. However, urgency, social

communication, and self-efficacy were not significantly correlated with confidence in SDM. See

Table 2.

Mediation

We hypothesized that characteristics common to ADHD and ASD, such as emotion

dysregulation, poor social communication, high urgency and low conscientiousness, would all

negatively impact confidence in SDM. We also hypothesized that self-efficacy would serve as a

mediator between these characteristics, and diminished confidence in SDM. As part of

examining this model, we also included race and gender as covariates as these demographic

variables have been shown to impact confidence in SDM (Adisso et al., 2020; Peek et al., 2010).

In examining associations with the mediator, only emotion regulation and social

communication significantly predicted the mediator self-efficacy as urgency (β = .002, p = .97)

and low conscientiousness (β = -.09, p = .28) did not significantly predict self-efficacy [F(6, 112)

= 2.78, p = .01, R^2 = .13]. In the next step examining direct predictors of confidence in SDM,

emotion regulation significantly predicted confidence in SDM above and beyond other predictor

variables including urgency and low conscientiousness. Low conscientiousness also tended to be

associated with confidence in SDM. Urgency (β = .14, p = .18) and social communication (β

=.21, p = .30) were not significantly [F(7, 111), = 1.83, p = .09, ΔR^2 = .10] associated with

confidence in SDM. Finally, self-efficacy was not significantly associated with confidence in

SDM (β = .22, p = .30) and there were no significant indirect effects through self-efficacy (95%

CI [-.19, .62]). See Figure 2.

Additionally, given that the missingness for emotion regulation was significant, we also

ran a mediation model including this variable alongside the other predictors. However, it did not

appear to significantly impact the model, as all paths remained the same.

Exploratory ANOVA

We also ran an exploratory one-way ANOVA to examine whether there were significant differences among our predictor variables between those with and without a self-reported neurodevelopmental disorder diagnosis. In the current sample 25 individuals reported a diagnosis of ADHD or ASD, and 116 reported no diagnosis. We found that individuals who reported a neurodevelopmental disorder were significantly different on several variables (see Table 2) including a statistically significant difference in confidence in SDM between those with and without a neurodevelopmental disorder diagnosis, with those reporting a neurodevelopmental disorder reporting lower confidence in SDM overall ($F(1, 138) = 11.98$, $p = <.001$). We also found a statistically significant difference in urgency [$F(1, 132) = 4.64$, $p = .03$], and low conscientiousness [$F(1, 135) = 13.29$, $p <.001$], with those with a neurodevelopmental disorder reporting higher urgency and less conscientiousness.

Supplemental Analysis

We also conducted an exploratory parallel mediation model that added ASD symptoms and ADHD symptoms as covariates, to examine whether symptomatology impacted the associations between study variables. In this model, emotion regulation ($\beta = -.08$, $p = 0.03$) continued to significantly predict self-efficacy [$F(8, 103) = 2.03$, $p = .05$, $R^2 = .14$]. Social communication was, however, approaching significance when symptomatology was included in the model ($\beta = .19$, $p =.06$). Again, urgency ($\beta = -.02$, $p = .75$) and low conscientiousness ($\beta = -.07$, $p = .42$) did not significantly predict self-efficacy. Only ADHD symptoms ($\beta = -.13$, $p = .02$) was significant in predicting confidence in SDM [$F(9, 102) = 1.6$, $p = .13$, $\Delta R^2 = .12$]. All other predictors, including emotion regulation ($\beta = -.07$, $p = .42$), social communication ($\beta = .27$ $p = .27$), urgency ($\beta = .17$, $p = .14$) and low conscientiousness ($\beta = -.30$, $p = .17$) did not

significantly predict confidence in SDM. Self-efficacy still did not significantly predict

confidence in SDM in this model ($\beta = .29$, $p = .21$) and the final indirect effect of self-efficacy

on confidence in SDM was not significant (95% CI [-.04, .14]. See Figure 3.

Discussion

There are many noted difficulties to achieving SDM with a healthcare provider, ranging

from barriers such as lack of time to consumer characteristics. Past studies have indicated

providers view certain traits as barriers to achieving SDM with a consumer (Charles et al., 2004;

Graham et al., 2003). Our study specifically focused on how specific personal traits impact

SDM, including self-efficacy. According to the Makoul and Clayman model (2006), self-efficacy

is integral to achieving SDM, and self-efficacy has been associated with wanting more

involvement in healthcare decision making (Schoenfeld et al., 2018). We also focused on

personal traits that are common to individuals with ASD and ADHD as the experiences of these

populations with SDM has not been examined, and they may have fewer opportunities to use

SDM (Hubner et al., 2016). The traits we examined, specifically emotion regulation difficulties,

social communication difficulties, and aspects of impulsivity, can also be experienced by the

normative population and may be potential predictors of confidence in SDM (Mayes et al. 2012;

Panagiotidi et al., 2019; England-Mason, 2020). We hypothesized that these characteristics

common to ASD and ADHD, including emotion regulation, social communication, urgency, and

low conscientiousness, would predict confidence in SDM. We also hypothesized self-efficacy

would mediate these associations. However, only emotion regulation significantly predicted

confidence in SDM and mediation by self-efficacy was also not supported. However, we did find

significant preliminary results which would support further research in this field.

Emotion Regulation

Consistent with hypotheses, emotion regulation was significantly associated with confidence in SDM in the model. We hypothesized that a better ability to regulate one's affective state would result in higher confidence in SDM. Healthcare situations may often become stressful situations, especially with news of a new diagnosis, or having to make decisions regarding care (Treffers & Putora, 2020; Young et al., 2004). This is important for the normative population, but also relevant for those with a diagnosis of ADHD or ASD, as it was supported as a potential shared characteristic of both disorders (i.e., emotion regulation correlated positively with both ASD and ADHD symptoms in the present study). Individuals with ASD or ADHD often have difficulties regulating their emotions, and thus, emotion regulation difficulties may be even more relevant for their experiences with SDM.

While our exploratory ANOVA indicated no significant differences between those with and without a diagnosis of ADHD or ASD on emotion regulation, this may be because our sample reported low symptom severity for ASD and ADHD. ASD symptom severity is associated with poorer emotion regulation, as is ADHD symptom severity (Cibralic et al., 2019; Soler-Gutierrez et al., 2023). Although some participants did report having a diagnosis of ASD or ADHD, the average rating of symptom severity for individuals with ASD and ADHD was lower than the average typically seen for these groups (Adler et al., 2018; Woodbury-Smith et al., 2005). The next step in this project would be to recruit more individuals with ASD and ADHD, to account for those with more severe symptomatology.

However, while emotion regulation was directly associated with confidence in SDM in our model, this association was no longer significant in our further exploratory analyses including ADHD symptom severity and ASD symptoms as covariates in the model. In particular, ADHD symptom severity was a significant predictor of confidence in SDM. Emotion regulation

and ADHD symptom severity may share variability, which is supported by the significant positive correlation between the two variables (see Table 3), such that emotion regulation does not uniquely contribute to confidence in SDM when ADHD symptom severity is accounted for. Emotion regulation also had a strong positive correlation with ASD symptoms as well (see Table 3).

Emotion regulation also significantly predicted self-efficacy, in both our proposed and in our exploratory model covarying for race, gender, ADHD symptom severity, and ASD symptoms. This is consistent with our hypothesis that emotion regulation would impact the affective state of a consumer, and then impact their self-efficacy. According to Bandura's theory (1977), a better ability to monitor one's emotional state increases general self-efficacy through monitoring physiological states. We expected that having a better ability to manage emotionally charged situations would predict better self-efficacy and that it may be helpful to improve emotion regulation abilities to improve self-efficacy.

While our model indicates emotion regulation predicts self-efficacy, it is not known *how* it impacts self-efficacy. It may impact self-efficacy through two methods: 1) through the mitigation of negative emotions and 2) the expression of positive emotions (Caprara et al., 2022). However, instances where SDM is needed may involve more negative emotions. In instances with healthcare providers, the reduction of negative emotion is likely more important than the expression of positive emotions. Several written accounts recalled having to manage feelings of 'fury' or being 'weirded out' while having negative experiences with their provider. Notably, we did not ask participants how they engage in emotion regulation during their encounters with providers. However, future research should examine how consumers engage in emotion regulation during these situations.

Urgency

Urgency did not significantly predict confidence in SDM. While there is evidence connecting urgency to decision-making, there is no research identifying urgency as a characteristic directly affecting SDM (Kräplin et al., 2014; Sperry et al., 2016). Many of the studies connecting urgency to poor decision-making utilize gambling tasks, or tasks of high monetary risk. These decisions need to be quick and instantaneous, while medical decisions do not need to be instant. In situations requiring medical decision-making, providers talk with their patients. While gambling or dice tasks take seconds, the average medical visit is 17 minutes (Tai-Seale et al., 2007). Urgency, as a factor more relevant for quick decisions, may not be relevant for longer-term, medically-focused decisions.

While it may not be relevant for SDM, urgency is relevant to those with a diagnosis of ASD or ADHD, as a potential shared characteristic. Our exploratory ANOVA found individuals with a diagnosis of a neurodevelopmental disorder reported higher urgency. Additionally, urgency correlated positively with both ASD and ADHD symptom severity. It is likely high urgency still impacts those with ASD or ADHD, which may impact quick decisions, but may not impact more complex decisions like those made in the healthcare context.

In this study, we combined both negative and positive urgency into a single score. It may then be that positive urgency, which refers to urgency from emotions such as joy or happiness, specifically is not related to SDM. This lack of association could have affected urgency's overall relationships to confidence in SDM. It is likely that negative emotions are more salient to SDM experiences. Given that healthcare decisions often can be emotional events, with much of the reported emotions being more negative in nature. For example, learning of a new or concerning diagnosis would invoke negative emotions and therefore negative urgency (Treffers & Putora,

2020; Young et al., 2004). While most participants did not report how they felt during a

diagnosis, some did. For example, one participant recalled feeling 'isolated' after their ASD

diagnosis, while another recalled feeling 'conflicted' after a chronic immune system disorder

diagnosis. These negative feelings may be more relevant for medical decision-making. Anxiety,

a negative emotion, has been found to be significantly correlated with SDM, and has also been

found to be reduced after SDM interventions (Chen et al., 2023). Therefore, negative urgency

may be more relevant to SDM than positive urgency.

Urgency also did not significantly predict self-efficacy. Past studies indicated urgency to be

correlated with different types of self-efficacy, as well as general self-efficacy overall (Petker et

al., 2011; Stevens et al., 2016). However notably, both Stevens et al. (2016) and Petker et al.

(2011) used measures assessing *situational* self-efficacy, and not overall self-efficacy. It may be

that urgency does not relate to overall self-efficacy, but situational self-efficacy. Urgency may

still impact specific situations of self-efficacy through Bandura's Model, through the formation

of mastery experiences for specific situations (Bandura, 1977). Thus, urgency may be more

relevant for situational self-efficacy.

Social Communication

Social communication did not significantly predict confidence in SDM. This was a surprising

finding, but may be due to the domains of communication that were assessed. The scale we used

from the ASSI may not be a representation of social communication skills most relevant for

confidence in SDM, as it is comprised of social expressivity, social control, and social sensitivity

in everyday situations which may not capture the specific communication experiences that occur

in healthcare. Future research may utilize another scale that measures other aspects of social

communication that may be more relevant to SDM. For example, the Interpersonal Competence

Questionnaire (Buhrmester et al., 1988) measures aspects of social communication such as providing emotional support, managing conflicts, and initiating relationships. These aspects of communication may be more relevant to SDM. Deledda et al. (2013) found that within provider-consumer interactions in SDM, individuals often report desiring social communication characteristics such as showing empathy, managing emotional conflicts, and showing explorative behavior. This study also indicates that what a consumer desires in communication may be more relevant than their skills. Therefore, our measure of social communication may not have captured the types of social communication used within SDM, and it did not capture desire for communication interactions. Finally, to our knowledge, there is not an established measure that examines social communication specifically in healthcare interactions. Therefore, future research may benefit from examining other aspects of social communication, such as managing conflict, and developing measures that assess communication skills directly within the provider-consumer interaction.

Social communication did not differ between participants based on diagnosis status within the exploratory ANOVA, but this may be due to differences in symptom severity, as in emotion regulation. In our study individuals who reported a diagnosis of ADHD or ASD reported less severe symptoms than others reporting those same diagnoses in past research. The average score on the assessment of ASD and ADHD symptoms for those reporting a neurodevelopmental disorder in the present study were slightly (i.e., one point) lower than the threshold for diagnosis of ASD and/or ADHD (Adler et al., 2006; Baron-Cohen et al., 2001). A previous study has indicated that higher ADHD symptom severity leads to deficits in social communication (Panagiotidi et al., 2019), while another study found social responsiveness to be correlated with ASD symptoms (Frederick et al., 2022). A lower severity of ADHD and ASD symptoms, as we

had in our study, may not differ significantly in social communication skills from a normative

population. This may also explain why social communication only correlated positively with

ASD symptoms; it is likely still a shared characteristic of ASD and ADHD but may be more

impactful for those with more severe symptomatology.

However, social communication did predict self-efficacy in our model, and remained

marginally significant in our exploratory model in which we included race, gender, ADHD

symptom severity, and ASD symptoms as covariates. This is consistent with prior studies, as

well as with Bandura's Model (1977). According to Bandura's model, through social

communication with others, individuals are able to receive positive reinforcement about their

social abilities (Bandura, 1977). We specifically posited social communication skills would

impact self-efficacy through individuals asking for support or feedback from others; ideally,

initiating help-seeking behaviors. We would expect an individual high in social communication

skills would be able to initiate conversations with others and receive feedback about how they

behaved in a situation, leading to better self-efficacy. Indeed, past research has indicated the skill

of initiating relations predicts self-efficacy (Salavera et al., 2017). Social communication skills

may also impact self-efficacy through general sociability (Salavera et al., 2017). It may be that

social communication impacts self-efficacy through individuals directly asking for support, as in

Bandura's model (1977), as well as through general sociability.

Conscientiousness

Low conscientiousness was approaching significance in predicting confidence in SDM in our

model. We initially hypothesized low conscientiousness would result in diminished confidence

in SDM through difficulties in concentrating while making decisions (Sperry et al., 2016).

However, it no longer tended to be associated with SDM once ADHD and ASD symptoms were

added as covariates in the supplemental model. It is likely that low conscientiousness is a shared characteristic of ASD and ADHD, as it correlated positively with both ASD and ADHD symptoms. It may be that conscientiousness does not uniquely predict confidence in SDM particularly when ADHD symptoms, which as discussed previously were significantly associated with confidence in SDM, are included in the model.

Conscientiousness was also not associated with SDM, possibly for similar reasons as urgency. Prior research connecting conscientiousness to poor decision-making utilized quick gambling tasks (Sperry et al., 2016; Zermatten et al., 2005), and lack of perseverance has only correlated with cognitive efforts (Fortgang & Cannon, 2005). Impulsivity overall may not be relevant to SDM. However, similarly to urgency, low conscientiousness is still common in those with a diagnosis of ASD or ADHD. Indeed, we found individuals with a reported diagnosis of either ASD or ADHD disorder reported lower conscientiousness. Low conscientiousness, like the other facets of impulsivity, urgency, likely still affects quick decision-making for those with a diagnosis.

It may also be that low conscientiousness is not related to confidence in SDM for a normative student population. Our population, many of whom were young adults who were just beginning to see providers on their own, have not yet had to make more serious medical treatment decisions that may require conscientiousness. Many of the short answer responses regarding healthcare interactions referenced regarding SDM referred to everyday checkups, or urgent care visits for a cold. Low conscientiousness may be more applicable for situations that require more serious decisions, such as whether to have surgery. Much of the research on SDM focuses on populations that need to make more serious decisions, such as in oncology, or in diabetes management (Kane et al., 2014; Tamhane et al., 2015).

Low conscientiousness may also not be related to confidence in SDM in our model because many individuals in this study recalled one-time visits, or visits with providers that were shorter than six months or less. These visits may be too short to allow for experience in SDM to develop. Qualitative interviews with patients often cite longstanding relationships as crucial for SDM (Kelley et al., 2015). Low conscientiousness may be more of an important factor in confidence in SDM for individuals who continually see the same provider over a longer period of time regarding an issue or diagnosis. It takes time to build confidence in SDM and so again, may not be relevant to a population that is just starting to see providers on their own.

Low conscientiousness also did not predict self-efficacy. We predicted low conscientiousness would impact self-efficacy through the formation of mastery experiences (Bandura, 1977), as an individual with low conscientiousness may make rash choices or be unable to persist with self-efficacious behaviors. Past studies have also indicated conscientiousness to have a small to medium sized correlation with self-efficacy (Chen et al., 2001; Lee & Klein, 2002), while conscientiousness has previously predicted self-efficacy (Amirazodi & Amirazodi, 2011). However, both Amirazodi and Amirazodi (2011) and Lee and Klein (2002) used measures assessing conscientiousness as an aspect of the big five personality factors (Rothman & Coetzer, 2003). Our study utilized two scales from the UPPS-P, a measure assessing impulsivity, to form the facet of low conscientiousness, and so future research may want to more directly assess the concept of conscientiousness.

Self-Efficacy

We anticipated that self-efficacy would mediate the relationship between emotion regulation, social communication, urgency, low conscientiousness, and confidence in SDM, but this was not supported. Past studies have indicated general self-efficacy to be related to SDM (De Las Cuevas

et al., 2014; Michaelis et al., 2017); however, these studies utilized a population with mental

health diagnoses, such as depression, bipolar disorder, or schizophrenia. It may be that self-

efficacy is more impactful for SDM in a psychiatric population, but less so for a more normative

population. Having a diagnosis of a mental health concern has been found to be associated with

lower self-efficacy (Rabani Bavojdan et al., 2011). Additionally, Michaelis et al. (2017) and De

Las Cuevas et al. (2014) utilized the General Self-Efficacy Scale, (GSES, Schwarzer &

Jerusalem, 1995), and not the NGSE. The GSES may be unrelated to self-efficacy in healthcare

decision-making because of its noted multidimensionality (Chen et al., 2001). The GSES tends to

fit best to a two-factor model composed of coping and action self-efficacy (Zhou, 2016). It may

be that a *specific* type of self-efficacy then impacts confidence in SDM. Finally, these two

studies utilized the Control Preference Scale to measure preferences of SDM. It may be that self-

efficacy predicts *preferences* of SDM, but not *perceived* experiences of SDM.

We also expected that participants with a neurodevelopmental disorder would report poorer

self-efficacy, but there was no significant difference between those with and without a

neurodevelopmental disorder. This may be because we utilized a college sample. All participants

in this study were college students at a university with support for students impacted by a

neurodevelopmental disorder, such as the Spectrum Support Program (Spectrum Support

Program, n.d.). Further, views of neurodevelopmental disorders (i.e., stigma) may also be

changing which could impact the degree to which these disorders may be associated with lower

self-efficacy. Furthermore, all students who completed this study did so for course credit,

indicating some academic self-efficacy. Overall self-efficacy has been found to correlate with

academic motivation, a related concept (Honicke et al., 2023).

Race and Gender

In our model, we also included race and gender as covariates, as past studies have indicated certain races report diminished SDM experiences, and that there may be differences in how men and women report experiences of SDM (Adisso et al., 2020; Lin & Kressin, 2015; Peek et al., 2010). However, neither race nor gender were significantly associated with confidence in SDM. The majority of our sample was white, so we may not have had enough power to detect differences among racial experiences in SDM. As for differences in gender, the lack of any differences may be because gender may affect other aspects of SDM, but not confidence in SDM. Perkins et al. (2019) found gender impacted *preferences* for SDM, but not perceptions. Additionally, another prior study did indicate consumer gender did not influence perception of SDM experiences (Alameddine et al., 2022).

Limitations and Future Directions

There are some limitations within this study. Notably, we did not obtain any perceptions of SDM from healthcare providers. SDM is a mutual process and requires both a provider and a consumer to occur (Lown et al., 2009). We did not obtain any ratings of patient trust, or how well a consumer believes their provider is honest and knowledgeable, which has also been implicated for SDM (Fiscella et al., 2004; Kelley et al., 2016). Lastly, it would be helpful to include a measure of patient preference, or how involved a consumer wants to be in medical decisions, such as in the Control Preference Scale (CPS; Degner et al., 1997). The CPS has also been shown to be highly predicted of SDM preferences. Therefore, future research could examine these additional facets of SDM.

Furthermore, we did not measure the amount of time consumers spent with their provider. Engaging in SDM often takes time, with most models requiring at least three to five minutes; however, for most everyday medical decisions, such as whether to start a new medicine,

providers only have one to two minutes (Caverly & Hayward, 2020). We also did not ask all participants for the amount of time since the last visit, only asking those who no longer saw their provider. This is important, as time affects memory, with individuals often distorting memories the more times they remember a certain event (Paul, 2012). As time passes from the interaction with the provider, consumers may forget key parts of the interaction, resulting in them viewing an interaction more or less positively. Importantly, we also did not take objective assessments of SDM interactions which may provide important information on the characteristics leading to successful SDM, and all measurements were self-reported. Self-report measures are often affected by biases (Rosenman et al., 2011). A future study could utilize the Observing Patient Involvement in Decision Making scale (OPTION), which involves a trained observer rating the amount of SDM between a provider and consumer (Elweyn et al., 2005). Similarly, we did not take objective assessments of social communication. The lack of a significant association between social communication and confidence in SDM may also be due to deficits in language ability that was not self-reported.

Additionally, given that emotion regulation was significantly associated with confidence in SDM, an important next step would be identifying which cognitive style of emotion regulation improves confidence in SDM. There are a number of emotion regulation strategies, ranging from mindfulness, to rumination, and expressive suppression (Naragon-Gainey, 2017). Future research could incorporate the Emotion Regulation Questionnaire (ERQ), which measures expressive suppression and cognitive reappraisal (Gross & John, 2003).

Finally, we would want to re-examine these relationships in other, non-college student populations. Our sample consisted of all college students, with an average age of about 20 years old. Within many of their written narratives, individuals often reported seeing the same doctor

they had seen since they were a child, or their parents being heavily involved in their healthcare. Older adults would be likely to report less of these experiences, and so their results may change. The mean score of overall confidence in SDM for our study was slightly lower than other reported studies (Gry Harmsen et al., 2014; Rogers et al., 2013). Further this past work with this measure has also been done with samples of adults older than the present sample. More specifically, Rogers et al. (2013) reported a mean age of 65.1, while Gry Harmsen et al. (2014) reported a mean age of 56.4. This indicates that our population, with a mean age of 19.4, may have less confidence in SDM than older adults.

We would also want to do this study among a clinical population. Based on prior studies (De Las Cuevas et al., 2014; Michealis et al., 2017), factors such as self-efficacy may be more important for those with mental health diagnoses.

Practical Implications

While our mediation model was not significant, we did find evidence that emotion regulation impacts confidence in SDM, indicating one shared characteristic between ASD and ADHD does impact SDM. This indicates that a consumer's emotion regulation abilities should be considered during the SDM process. In consumer-provider SDM interactions, it may be helpful for consumers to be made aware of manners to improve their emotion regulation skills. Consumers low in emotion regulation abilities could benefit from receiving Emotion Regulation Therapy (Renna et al., 2017).

Our exploratory ANOVA also found individuals with a neurodevelopmental disorder reported significantly worse confidence in SDM than individuals without a neurodevelopmental disorder. This indicates providers may need to engage more with consumers with ADHD and/or

ASD than consumers without these conditions. They may need to ask more questions or facilitate more involvement in the decision-making process to help build consumer SDM confidence. There currently exist several workshops and training courses for providers to improve their usage of SDM with consumers (Harvard, 2021). Alternatively, given that SDM is a reciprocal relationship, individuals with ASD and/or ADHD could also improve their skills in SDM. While there exists programs designed to improve SDM skills for a normative population, (Muscat et al., 2019), there are no programs focused on ASD and ADHD consumers.

Finally, ADHD symptoms also uniquely predicted confidence in SDM in our exploratory model including ASD symptoms, ADHD symptom severity, gender, and race as covariates. This indicates individuals with more severe manifestations of ADHD may report less confidence in SDM than individuals with less severe manifestations. Therefore, individuals with more severe ADHD symptomatology may require more coaching to assist them with increasing their confidence in SDM. A preventive measure could be assigning those with higher ADHD symptoms to programs improving SDM skills.

Conclusions

Importantly, this is the first research study examining how characteristics common to ASD and ADHD, as well as a diagnosis of ASD or ADHD, impact SDM healthcare experiences. Evidently, while self-efficacy may not mediate the relationship between these shared characteristics and confidence in SDM, emotion regulation did predict confidence in SDM, and we did find differences between individuals with and without a diagnosis of a neurodevelopmental disorder. Our study is just the first step into the new field of SDM, and next steps should be taken to continue examining consumers with ASD and ADHD and their SDM experiences.

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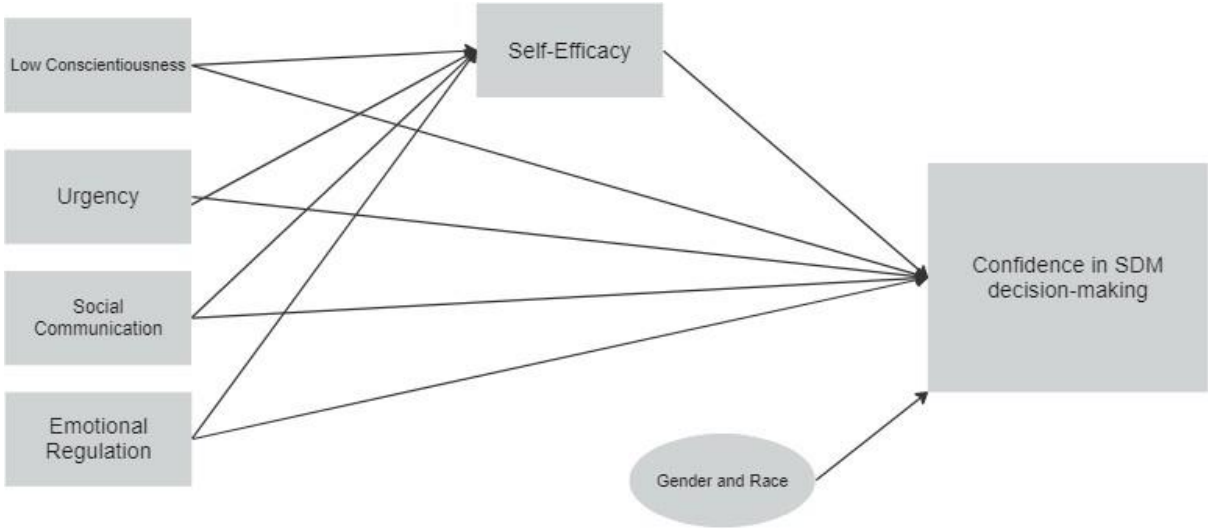
Figure 1: Proposed Mediational Model

Figure 2

First Mediation Model Including Race and Gender as Covariates

Low Conscientiousness

Urgency

Social Communication

Emotional Regulation

Self-Efficacy

Confidence in SDM

Gender and Race

$\beta = .19, p = .03$

$\beta = -.07, p = .02$

$\beta = -.39, p = .06$
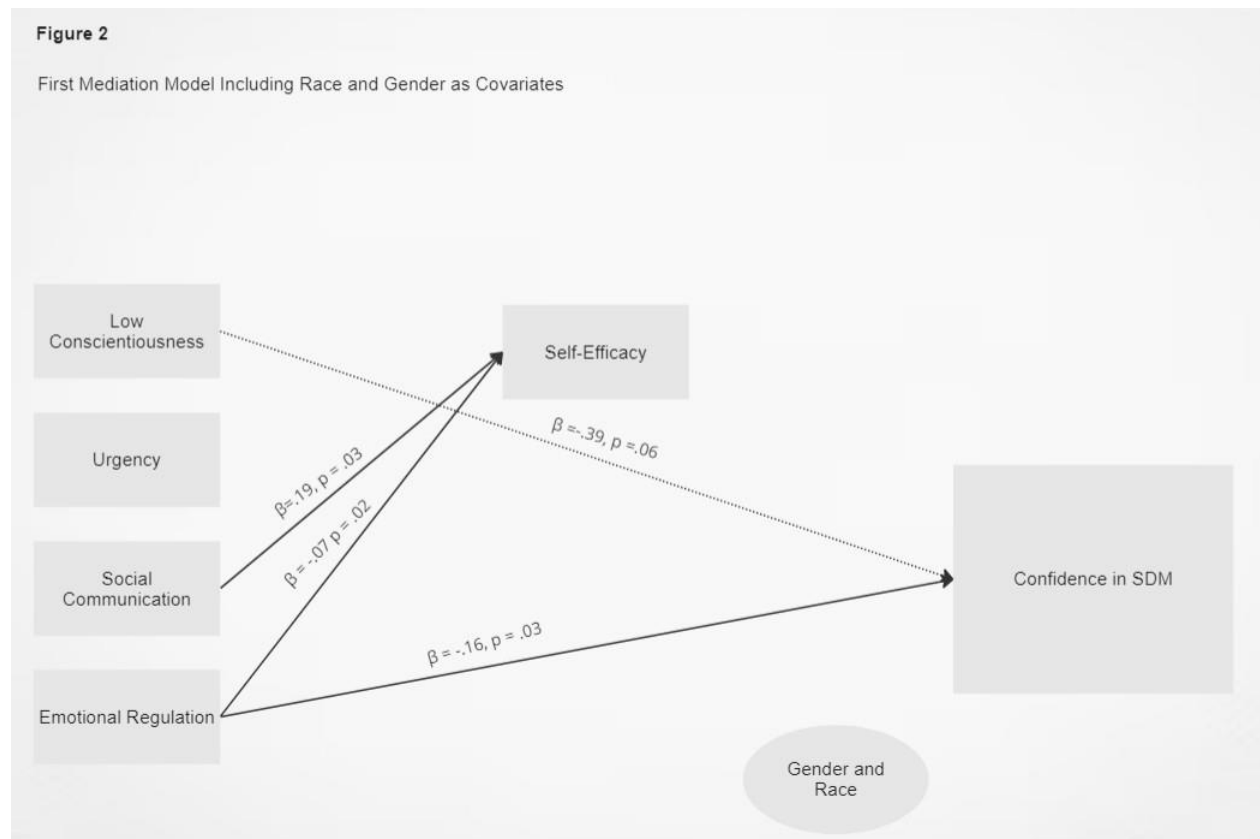
$\beta = -.16, p = .03$

Figure 2: Mediational Model Findings

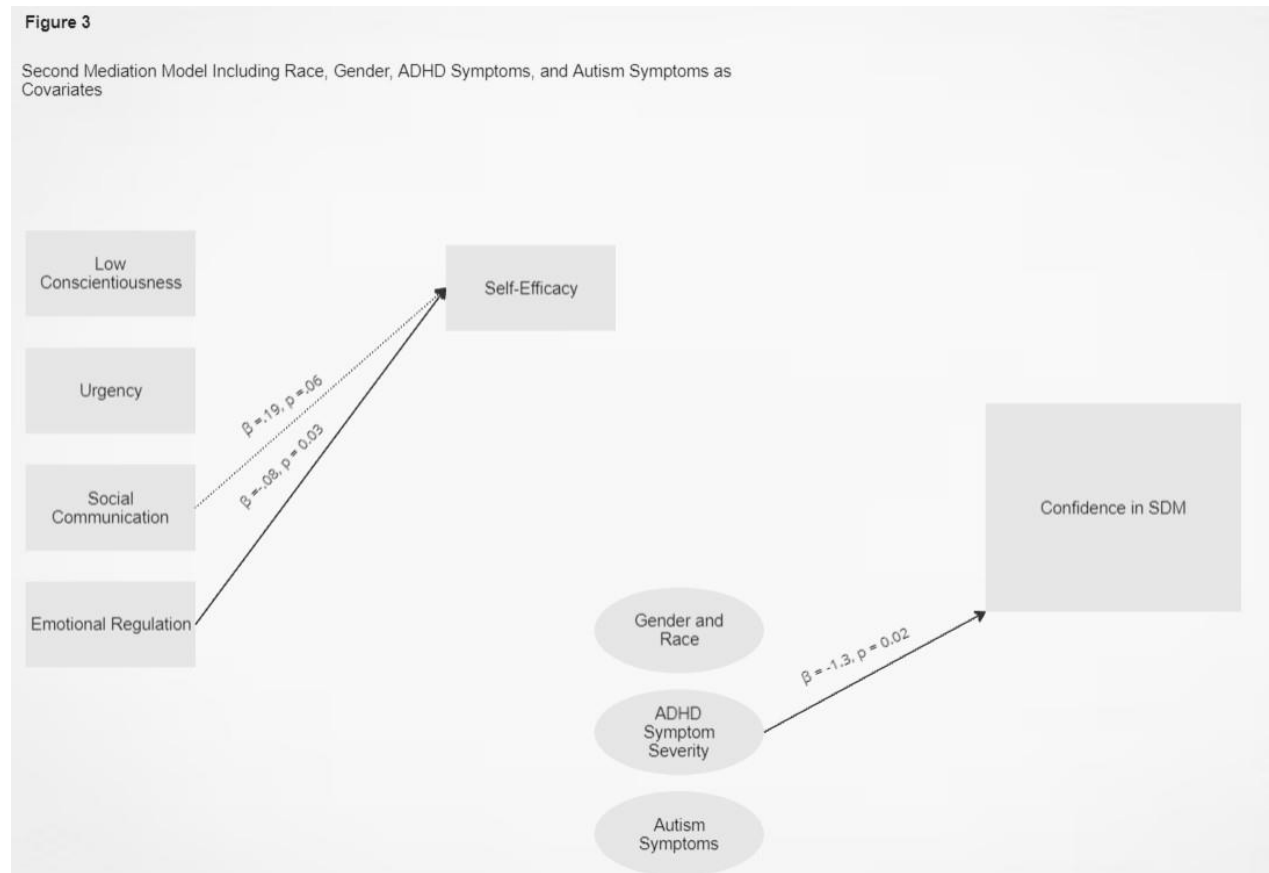*Note:* The above image displays all paths that are significant and trends.

Figure 3: Exploratory Mediational Model

Note: The above image displays all paths that are significant or trends.

Table 1

Participant Demographics (n = 141)

Age	$M = 19.4$ ($SD = 1.4$)
Gender Identity	47.5% Male, 48.9% Female, 2.9% Non-Binary, .7% Agender
Race	73.2% White, 16.7% Asian, 5.1% Black, 3.6% mixed, and 1.4% Other
Ethnicity	88.7% Non-Hispanic or Latino, 11.3% Hispanic or Latino
Hearing Status	96.4% Hearing. 3.6% Hard of Hearing or Deaf
Class Year	43.3% Freshman, 19.1% Sophomore, 17% Junior, 14.9% Senior, and 5.7% Fifth or Sixth Year

Table 2

Healthcare Narratives

	Overall Experiences	Specific Experiences
Physical Healthcare	45.4%	73%
Mental Healthcare	19.9%	18.4%
Both	12.8%	2%
Unknown/Unclear	22%	6.4%

Table 3

Correlations between main study variables

	1.	2.	3.	4.	5.	6.	7.
1. Confidence in SDM	-						
2. Low Conscientiousness	-.25**	-					
3. Urgency	-.10	.38**	-				
4. Social Communication	.08	-.02	.26**	-			
5. Emotional Regulation	-.21*	.21*	.44**	.17	-		
6. Self-Efficacy	.13	-.15	-.07	.17*	-.25**	-	
7. ADHD Symptom Severity	-.27**	.31**	.45**	.35**	.55**	-.09	-
8. ASD Symptoms	-.17*	.13	.28**	-.15	.50**	-.21*	.48*

Table 4

One-Way ANOVA Comparing Participants with a Diagnosis of ASD or ADHD and Without a Diagnosis

	Diagnosis		No Diagnosis		df	F	p
	M	SD	M	SD			
Confidence in SDM	69.2	17.63	80.63	14.33	138	11.98	<.001
Low Conscientiousness	45.8	8.94	39.96	6.83	135	13.29	<.001
Urgency	58.09	17.25	50.22	15.65	132	4.63	<.033
Social Communication	31.08	5.79	32.17	7.37	138	.48	.49
Emotional Regulation	89.95	25.95	84.83	22.27	130	.92	.34
Self-Efficacy	29.2	4.68	30.23	6.44	138	.57	.45
ADHD Symptom Severity	6.32	2.67	4.55	3.50	137	5.65	.02
ASD Symptoms	25.12	7.05	20.79	6.37	132	9.04	.003