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Exploring a Possible Mechanism Underlying Stereotype Threat in ADHD

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Exploring a Possible Mechanism Underlying Stereotype Threat in ADHD

A Thesis

Presented to the Department of Psychology

College of Liberal Arts and Sciences

and

The Honors Program

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Butler University

In Partial Fulfillment

of the Requirements for Graduation Honors

Alexandra Jasmine Gabor

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Abstract

Previous research has shown that college students with ADHD often struggle academically. The present study explores a possible mechanism underlying stereotype threat in ADHD that may explain the cognitive challenges that those with ADHD face. I examined whether exposing college students with ADHD to positive or negative stereotypes about the disorder would change their self-perceptions and their performance expectations, thereby changing their working memory performance. I hypothesized that those exposed to negative stereotypes would report having more ADHD symptoms, expect to perform worse on tests of working memory, and thus would score lower on working memory measures compared to those exposed to positive stereotypes. Twenty college students with an ADHD diagnosis participated in this study. Half of the participants read and answered questions regarding a paragraph containing negative stereotypes about ADHD while the other half read a paragraph containing positive stereotypes. Surprisingly, stereotype threat did not significantly affect students' symptom self-perceptions or performance expectations. Stereotype threat did, however, affect working memory performance on one measure. Those who were in the negative stereotype threat condition unexpectedly outperformed those who were in the positive stereotype threat condition on the PASAT. There were significant correlations between symptom self-perceptions and performance expectations; participants who reported having more ADHD symptoms expected to perform worse or they believed they performed worse on working memory measures after completing the task. Although these correlations support a possible link between self-perceived symptomatology and performance expectations, a larger sample size may be necessary to reveal significant

relationships between self-perceptions and performance itself, thus uncovering a mechanism behind stereotype threat while also explaining cognitive deficits seen in those with ADHD.

Exploring a Possible Mechanism Underlying Stereotype Threat in ADHD

Attention Deficit Hyperactivity Disorder (ADHD) is a common behavioral diagnosis among young adults. Those who have ADHD are distracted easily, talk excessively, and even have deficits in working memory (American Psychiatric Association, 2013; Dawson et al., 2004; Swanson & Sachs-Lee, 2001). These ADHD symptoms contribute to the stereotypes that are often applied to those who have the diagnosis. Chew, Jensen, and Rosen (2009) found that college students used negative adjectives more so than positive adjectives when describing their peers with ADHD. Students with ADHD are not immune to having these negative stereotypes of the disorder. In the same study, students diagnosed with ADHD described their ADHD peers more negatively than students without ADHD did. However, not all research has documented negative perceptions of ADHD by those with the disorder. Gajaria, Yeung, Goodale, and Charach (2011) found that there were three times as many positive than negative comments about ADHD posted on Facebook ADHD support group pages. The students with ADHD who frequented these pages were aware of the negative stereotypes about their diagnosis, but they did not talk about ADHD in a negative light.

Although findings have been mixed with regard to ADHD stereotypes, there is evidence that the negative stereotypes that are held about those who have ADHD could negatively affect their self-perceptions and their cognitive performance. Foy (2015) examined the potential role of stereotype threat in influencing the cognitive performance of students with ADHD. Out of the 114 participants in his study, 53 reported having a history of ADHD. Half of the participants from the ADHD group, as well as half of the participants from the control group, were exposed to stereotype threat while the

remaining participants were not. Before asking the participants to answer GRE questions, Foy (2015) asked students in the threat condition to complete the Adult ADHD Self Report Scale (ASRS) symptoms checklist and warned them that those with ADHD usually score much lower on GRE questions compared to those without ADHD. Demonstrating the negative impact that stereotypes can have on cognitive performance, he found that students with ADHD who were exposed to stereotype threat performed significantly worse on quantitative GRE questions compared to those with ADHD who were not exposed to the threat.

Interestingly, the negative impact that ADHD-related stereotype threat has on cognitive performance is *not* limited to those who have an ADHD diagnosis. Wei and Suhr (2015) had 72 undergraduate college students who were *not* diagnosed with ADHD complete the ASRS; only those who scored above the 50th percentile and who had a high concern about having ADHD were chosen to participate in the study. They told half of these students that they would be playing a computer game (control condition) and the other half that they would complete a computerized task assessing working memory and attention that is commonly used to evaluate ADHD (diagnostic threat condition). Those students who were exposed to the diagnosis threat performed worse on the computerized assessment compared to their peers who were playing the same computer game for fun. Their findings suggest that when college students believe they are being evaluated on skills that they are concerned about, their performance is negatively affected even when they are not officially diagnosed with ADHD.

In another study, Suhr and Wei (2013) not only investigated the influence of perceived threat on college students without ADHD, but also examined attributions these

students made about their performance. This study included 85 participants none of whom had ADHD. Half of them were told that they were going to play a computer game for fun (control condition) and the other half were told that they were going to play a computer game that measured intelligence (evaluative threat condition). The students in the evaluative threat condition performed worse on the complex working memory measure compared to those who were given non-threatening instructions. Even more revealing, the students who were high in trait self-handicapping and who had experienced the threat reported more ADHD symptoms after completing the test compared to their peers in the non-threatening control condition. These findings suggest that even students without ADHD may attribute their poor performance to having ADHD symptoms.

Although no studies have examined the self-perceptions of students *with* ADHD, Privitera, Agnello, Walters, and Bender (2015) conducted a study on the self-perceptions of college students who were *misled* to believe that they had ADHD. Undergraduate students completed a pretest, the ASRS. Fifty-four participants, all of whom scored below clinical significance, were chosen to participate in the study. When they returned one week later, participants received random feedback from the pretest. “Negative” indicated that they did not have symptoms consistent with ADHD, “positive” indicated that they did have symptoms consistent with ADHD, and “no feedback” meant that the results were not ready yet. Participants then completed a posttest, which was the same items from the ASRS but presented in a backwards order to reduce testing effects. Although all participants had been selected for inclusion based on scoring below clinical significance on the pretest, those in the “positive” condition reported significantly more ADHD symptoms after receiving false positive feedback. More specifically, both total

scores and scores in the “inattentive domain” significantly increased at posttest for the students who received the false positive feedback. Presumably, these students changed their self-perceptions because they believed that they might have ADHD. This suggests that telling individuals that they have ADHD symptoms affects their self-perceptions even if they do not have a formal diagnosis of the disorder.

In summary, previous studies have shown that college students without ADHD may believe that they have ADHD and may report more ADHD symptoms in response to either performing poorly on working memory tasks or being told that they have the diagnosis (Privitera et al., 2015; Suhr & Wei, 2013; Wei & Suhr, 2015). In addition, Foy (2015) found that students with ADHD who were exposed to stereotype threat performed significantly worse on cognitive tests compared to those with ADHD who were not exposed to stereotype threat. Together, these findings raise the possibility that the effects of stereotype threat on the working memory of students with ADHD may emerge from changes in perceptions and expectations that those students experience due to the threat. However, no past studies have examined how stereotype threat affects self-perceptions of students diagnosed with ADHD or the potential influence of these self-perceptions and related expectations about performance on actual tests.

This current study examines whether or not exposing college students with ADHD to positive or negative stereotypes about the disorder will change their self-perceptions and their performance expectations, thereby changing their performance. I chose to include a positive stereotype threat condition in this study because I knew that participants would be aware that they were recruited due to their ADHD diagnosis, possibly contributing to negative stereotype threat even without exposure to negative

stereotypes. I hoped that a positive stereotype condition would counteract these effects. Additionally, previous studies have documented evidence supporting stereotype boost theory which proposes that exposure to positive stereotypes improves performance. For example, Shih, Pittinsky, and Ambady (1999) investigated how Asian American women performed on quantitative tests after either their race or their gender was made salient to them. The results of the study supported their hypothesis that those who were in the Asian-identity-salient condition performed better on the quantitative test than those in the female-identity-salient condition. They believed that because Asians stereotypically perform better on quantitative measures, making this characteristic salient boosted their performance. The opposite occurred for those in the female-identity-salient condition.

I expect that exposing those with ADHD to positive or negative stereotypes about the disorder will affect their performance in the same manner. That is, I hypothesize that participants with ADHD who are exposed to negative stereotype threat will report more ADHD symptoms, will expect to perform worse on working memory tasks, and will perform worse on working memory tasks than participants with ADHD who are exposed to positive information about the disorder. I also anticipate that the differences in the participants' expectations regarding their test performance that result from exposure to the stereotype threat will explain the differences I observe in their test scores. If these hypotheses are supported, this could reveal a mechanism that could explain how stereotype threat decreases cognitive achievement in a vulnerable college student population.

Methods

Participants

Twenty college students with a mean age of 19.80 ($SD = 1.03$) and a mean age of ADHD diagnosis of 14.85 ($SD = 4.10$) participated in this study. Half of the participants were assigned to read and answer questions regarding a paragraph containing negative stereotypes about ADHD ($n = 10$) while the other half read a paragraph containing positive stereotypes about ADHD ($n = 10$). Demographic data are summarized in Table 1 for participants in the two conditions. Students in both conditions were statistically equivalent in age, education, diagnosis age, and elapsed time since their last dose of ADHD medication (all $ps > 0.57$). In order to assure the validity of their ADHD diagnosis, all participants were registered through Butler University's Student Disabilities Services (SDS) office. Participants were either paid for their participation in the study at a rate of \$10 per hour or they received extra credit in a psychology course in exchange for their time.

Materials

"Memory" Paragraphs. The stereotype threat was presented in the context of a "memory" test. All participants read three paragraphs on various topics and answered five questions about what they read following each paragraph. For students in the negative stereotype threat condition, one of those three paragraphs reinforced common stereotypes of ADHD including how those with ADHD struggle cognitively and academically (see Appendix A). For the students in the positive stereotype threat condition, one of the paragraphs summarized how individuals with ADHD can overcome their symptoms through easily implemented strategies (see Appendix B).

Adult ADHD Self-Report Scale (ASRS; Kessler et al., 2005). The ASRS is a symptom checklist with 18 items reflecting the DSM-IV criteria for ADHD. Participants rated how often they have experienced each of these symptoms over the past six months.

Internal Restlessness Scale (IRS; Weyandt et al., 2003). The IRS assessed the construct of “mental restlessness” frequently reported by adults with ADHD. The IRS included 24 statements such as “Thoughts race through my mind,” and “I feel internally restless.” Participants rated each statement on a Likert scale ranging from 1= “none of the time” to 7= “all of the time.”

Dual 2 Back (Jaeggi, Buschkuhl, Etienne, Ozdoba, Perrig & Nikko, 2007). The Dual 2 Back is a test of working memory which required participants to attend to both auditory and visual information simultaneously. Participants heard an automated voice speaking letters of the alphabet and were told to press the “L” key on the computer keyboard when they heard the same letter that was spoken two letters before. At the same time, participants also attended to visual information. They saw blocks appear one at a time somewhere within a 3 by 3 grid on the computer screen. Similar to what was done with the auditory information, they pressed the “A” key on the computer keyboard when they saw the same block light up that was lit two blocks previously. Participants were given visual feedback on the computer screen whenever they made an omission or commission error on either the auditory or the visual portion of the task.

Letter Number Sequencing (LNS; Wechsler, 1997). During the LNS test, participants heard increasingly longer sequences of intermixed single digit numbers and letters. They first recited the numbers in ascending order then the letters in alphabetical order.

Paced Auditory Serial Addition Test (PASAT; Gronwall & Sampson, 1974).

During the PASAT, participants heard a sequence of single digit numbers first at a rate of 3 seconds and later at a rate of 2 seconds per digit. They added adjacent digits together and verbally reported the sum while also attempting to remember the last digit they heard so that they could add it to the next number.

Prediction and Postdiction of Task Performance (Suhr & Wei, 2013). Before completing each memory task, participants heard a description of the upcoming task and were asked to rate how well thought they would perform on a scale from 1= “much worse than most people my age” to 10= “much better than most people my age.” In addition, after completing each task, participants indicated how well they believe they performed using the same scale.

Demographic and ADHD questionnaire. This questionnaire asked participants’ age, education, race, and gender. It also included questions about their ADHD, such as age at diagnosis and typical medication regimen.

Procedure

After giving informed consent, participants were quasi-randomly assigned to one of two stereotype threat conditions, keeping the number of participants in each condition equal by assigning every other participant who volunteered for the study to a different condition. After completing the “memory” test, participants responded to the ASRS and IRS. Next, they took three working memory tests: 1) Dual 2 Back, 2) LNS, and 3) PASAT, providing predictions and postdictions before and after each test. Then, participants provided background information on the demographic and ADHD

questionnaire. Finally, participants were debriefed about the true purpose of the study and why the deception was necessary before they were thanked for their time.

Results

Manipulation Check

To assure participants paid adequate attention to the “memory” paragraph containing the ADHD stereotype threat, I ran a 3 (“Memory” Paragraph: 1, 2, 3) x 2 (Condition: negative stereotype threat, positive stereotype threat) mixed model ANOVA with the number of correct responses to the questions from each paragraph as the dependent variable (see Table 2). I wanted to assure that participants recalled the information from paragraph 2 just as well as they remembered the material from the other paragraphs.

A significant main effect of paragraph emerged, $F(2,17)=17.78, p=0.00, \eta_p^2=0.68$. Follow up analyses indicated that participants did not remember the details of paragraph 1 as well as those from paragraph 2 ($F(1,18)=14.87, p=0.001, \eta_p^2=0.45$) or paragraph 3, $F(1,18)=33.45, p=0.000, \eta_p^2=0.65$. In contrast, there was no significant difference in how well participants remembered information from paragraphs 2 and 3, $F(1,18)=1.00, p=0.33, \eta_p^2=0.053$. There was also no main effect of condition ($F(1,18)=2.42, p=0.14, \eta_p^2=0.12$) and no interaction between paragraph and condition $F(2,17)=1.01, p=0.39, \eta_p^2=0.11$. Thus, it was not the case that participants in the negative versus positive stereotype threat condition differentially remembered the target paragraph or that they remembered the target paragraph less well than the other paragraphs they read.

Primary Analyses

I ran a MANOVA to test my hypothesis that participants with ADHD who were exposed to negative stereotype threat would report more ADHD symptoms than those exposed to positive stereotypes (see Figure 1a). Contrary to expectations, participants in the two conditions reported the same levels of symptomatology on the ASRS and the IRS regardless of condition, $F(2,16)=0.57, p=0.58, \eta_p^2=0.07$.

Next, I examined the effect of the stereotype threat manipulation on participants' predictions and postdictions regarding their working memory test performance (see Figure 1b). Again, there were no significant differences between participants in the two conditions in terms of their predictions and postdictions, $F(6,13)=0.54, p=0.77, \eta_p^2=0.20$.

I also examined whether participants in the two stereotype threat conditions performed differently on the objective working memory measures using a MANOVA (see Figure 2). Because the main effect of condition neared significance with a moderate effect size ($F(3,16)=2.50, p=0.096, \eta_p^2=0.32$), I looked at the differences between the conditions on each of the three working memory measures to determine what was driving the near significant effect. There were no significant differences between conditions on the Dual 2 Back ($F(1,18)=0.28, p=0.60, \eta_p^2=0.02$) or on the LNS, $F(1,18)=0.62, p=0.44, \eta_p^2=0.03$. However, there was a significant difference between conditions on the PASAT, $F(1,18)=5.37, p=0.03, \eta_p^2=0.23$ (see Figure 2). Interestingly, this indicates that participants in the negative stereotype condition outperformed those in the positive stereotype condition on this measure of working memory.

Even though I found no differences across the two stereotype threat conditions in participants' self-perceptions or on two of the three objective test scores, I wanted to determine whether self-perceptions and performance expectations related to the scores

participants earned on the working memory measures. Thus, I calculated Pearson correlation coefficients among self-perceptions, performance expectations, and objective working memory performance (see Table 3). I found significant relationships between self-perceived symptomatology and performance expectations as well as between self-perceived symptomatology and perceived performance. Specifically, the correlations between self-reported symptoms on the ASRS and how well participants believed they would do on the Dual 2 Back ($r(18)=-0.63, p=0.003$) and on the PASAT ($r(18)=-0.50, p=0.02$) reached significance. There were also significant correlations between self-reported symptoms on the ASRS and how well participants believed they had performed on the Dual 2 Back ($r(18)=-0.46, p=0.04$) and the LNS, $r(18)=-0.53, p=0.02$. Self-reported symptoms on the IRS and participants' Dual 2 Back predictions ($r(17)=-0.57, p=0.01$) and LNS postdictions, ($r(17)=-0.07, p=0.001$) also correlated significantly. The only significant correlation involving an objective test was that between scores on the PASAT and participants' PASAT postdictions, $r(18)=0.57, p=0.009$. As shown in Table 3, no other significant correlations emerged between self-perceived symptomatology and actual performance on any of the working memory tests, nor between performance expectations and actual test scores.

Discussion

The goal of this study was to examine the effects of exposure to negative or positive stereotypes on self-perceptions, perceived working memory performance, and actual working memory of college students with ADHD. Previous research has shown that various forms of threat can negatively impact cognitive performance. Foy (2015) demonstrated that exposure to negative stereotypes led to decreased quantitative GRE

scores of students with self-reported ADHD. Similarly, Wei and Suhr (2015) found that students who were concerned about having ADHD, but who did not actually have the disorder, performed significantly worse on a working memory task when they were told that the task was used to assess ADHD. These studies led me to hypothesize that participants with ADHD who were exposed to negative stereotype threat would perform worse on working memory measures compared to those who were exposed to positive stereotypes. In another study, Suhr and Wei (2013) found that students who were not diagnosed with ADHD but who were exposed to negative stereotypes about ADHD and had high self-handicapping traits reported having significantly more ADHD symptoms compared to those who were not exposed to the negative ADHD stereotypes. This led to my hypothesis that students with ADHD who encountered negative stereotypes about the disorder would report more ADHD symptoms, which in turn would explain their decreased performance expectations and poor performance. If my hypotheses were supported, the relationship between performance self-perceptions and performance itself could help explain why college students with ADHD struggle academically (Norwalk, Norvilitis, and MacLean, 2009).

My hypotheses, however, were not supported by the data collected in this study. I found no significant differences between participants in the two stereotype threat conditions in self-perceptions, perceived working memory performance, or scores on two of the three working memory measures. Unfortunately, because the stereotype threat did not affect symptom self-perceptions or performance expectations, I was unable to investigate whether self-perceptions mediate performance. However, I did find a few significant correlations between self-reported symptoms and self-perceived performance

on working memory tasks. The ASRS was significantly correlated with how well students expected to perform on the Dual 2 Back and the PASAT and how well they thought they performed on the Dual 2 Back and the LNS. The IRS was also significantly correlated with the Dual 2 Back prediction and the LNS postdiction. There was an inverse relationship between participants' symptom self-perceptions and performance perceptions; when participants reported having more ADHD symptoms, they also believed they would perform or had performed worse on these measures. These findings provide insight into a possible mechanism underlying stereotype threat in ADHD. If students who perceive themselves as more symptomatic also expect to do poorly on objective test measures, they may, in turn, underperform relative to their true underlying capability. Past research has shown that self-efficacy, or how someone expects to perform on a task, affects how well they actually complete the task (Bandura, 1989).

Even though positive and negative stereotypes did not affect self-perceived symptoms or performance expectations, a significant difference did emerge between the scores of students in the two conditions on one of the three working memory measures included in this study. Surprisingly, those in the negative stereotype threat condition outperformed those in the positive stereotype threat condition on the PASAT. This finding is not consistent with those documented in past studies (Foy 2015; Suhr and Wei 2013; Wei and Suhr 2015). One explanation for this could be that the "memory" paragraphs may not have elicited the negative and positive stereotypes I had hoped. Those who were in the positive stereotype threat condition read a paragraph about effective strategies to manage ADHD symptoms, which hinted at potential positive outcomes without directly addressing positive aspects of ADHD itself (see Appendix B).

In fact, it is possible that the positive stereotype paragraph instead acted as a negative stereotype threat by reminding participants that they have a disorder that requires additional strategies (that they may not currently be using) to overcome their struggle with attention and organization. Perhaps, a more effective positive stereotype threat paragraph could have summarized positive attributes and advantages of having the disorder, such as explaining that individuals with ADHD are more creative and intuitive compared to their non-affected peers.

Similarly, exposure to stereotypes in the negative stereotype paragraph may not have influenced working memory performance because it did not directly speak to stereotypes regarding ADHD and working memory. Foy (2015) explicitly warned participants that those with ADHD perform significantly worse on the quantitative GRE measures that they were about to complete. This method of stereotype threat exposure may have had a stronger impact on the participants, thus leading to the significant differences between those who experienced the threat and those who did not in his study.

Several limitations of my procedures may have led to the lack of statistically significant differences between conditions on most of the included measures. First, my ability to detect significant effects was limited by the small sample size; I only had ten participants in each condition in my primary analyses. This small sample size was a result of the strict participation eligibility criteria that I utilized for my study. I only invited students who were registered with Butler University's Student Disabilities Services office to participate in order to assure that all participants had undergone a rigorous diagnostic process. As demonstrated by Privitera et al. (2015), simply giving participants a false ADHD diagnosis can lead them to report more ADHD symptoms, suggesting that ADHD

can be easily overdiagnosed if an individual believes that they have the disorder. While Foy (2015) included participants who self-reported having a history of ADHD, I intentionally set strict eligibility criterion for my study in order to disqualify those who may have been told by a teacher, parent, or primary care physician that they have ADHD but may have not been diagnosed according to official ADHD criteria.

Additionally, I only found a significant difference on one of the three working measures included in this study. Given the large number of outcome measures, this may represent a Type 2 error. I tried to control the likelihood of making a Type 2 error by submitting scores to a MANOVA rather than running a series of independent samples t-tests. At the same time, the MANOVA that focused on the working memory measures only resulted in a near significant effect of condition. Because of the small sample size in each condition and because the effect size associated with this difference was moderate, I proceeded to examine the differences between conditions on each working memory measure. This led to the discovery of the significant difference in PASAT scores across the two conditions. Larger sample sizes in future replications of this study could uncover significant differences on other working memory measures and will be necessary to determine whether positive stereotypes can truly undermine the working memory performance of students with ADHD as these results preliminarily suggest. Meanwhile, the current results should be interpreted with caution given these limitations.

Even though my hypotheses were not supported, my data does not rule out the possibility that changes in self-perceptions in response to stereotype threat could account for subsequent changes in performance. Future studies examining stereotype threat and how it affects those with ADHD should recruit participants who have an official ADHD

diagnosis, as this difference may affect the power of the study to detect true differences. Future research should also include a control condition in which participants are not exposed to any stereotype threat. While I originally intended to include this condition in my study, I was limited by my already small sample size. Instead, I focused only on the negative and positive stereotype threat conditions. Finally, using more direct and strongly-worded negative and positive stereotype paragraphs in future studies could enhance the possibility of finding performance differences in response to stereotype threat so that the possible role of symptoms and performance perceptions in this relationship can be examined more effectively.

In summary, neither negative nor positive stereotype threat significantly affected self-perceptions or perceived performance. A significant difference was found for one of the three working memory measures included in the study, with those in the negative stereotype threat condition surprisingly outperforming those in the positive stereotype threat condition. Future studies can adapt their approach to further explore a possible mechanism underlying stereotype threat in ADHD and to examine whether positive stereotypes can, indeed, have a paradoxical effect on working memory. Results of these studies could then be used to design interventions to combat potentially negative effects of everyday stereotypes experienced by those who have the disorder.

References

- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. Washington, D.C.: American Psychiatric Association.
- Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*, 729-735.
- Chew, B. L., Jensen, S. A. & Rosén, L. A. (2009). College students' attitudes toward their ADHD peers. *Journal of Attention Disorders, 13*, 271-276.
- Dawson, G., Toth, K., Abbott, R., Osterling, J., Munson, J., Estes, A. & Liaw, J. (2004) Early social attention impairment in autism: Social orienting, joint attention, and attention to distress. *Developmental Psychology, 40*, 271-283.
- Foy, S. L. (2015). Challenges from and beyond symptomatology: Stereotype threat in young adults with ADHD. *Journal of Attention Disorders, 10*, 1-12.
- Gajaria, A., Yeung, E., Goodale, T. & Charach, A. (2011). Beliefs about Attention-Deficit/Hyperactivity Disorder and response to stereotypes: Youth postings in Facebook groups. *Journal of Adolescent Health, 49*, 15-20.
- Gronwall, D.M. & Sampson, H. (1974). *The Psychological Effects of Concussion*. Auckland, New Zealand: Auckland University Press.
- Jaeggi, S.M., Buschkuhl, M., Etienne, A., Ozdoba, C., Perrig, W. J. & NirKKo, A. C. (2007). On how high performers keep cool brains in situations of cognitive overload. *Cognitive, Affective, & Behavioral Neuroscience, 7*, 75–89.

- Kessler, R. C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., et al. (2005). The World Health Organization adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*, 245-256.
- Norwalk, K., Norvilitis, J.M. & MacLean, M.G. (2009). ADHD symptomatology and its relationship to factors associated with college adjustment. *Journal of Attention Disorders, 13*, 251-258.
- Privitera, G. J., Agnello, J. E., Walters, S. A. & Bender, S. L. (2015). Randomized feedback about diagnosis influences statistical and clinical significance of self-report ADHD assessment in adults. *Journal of Attention Disorders, 19*, 447-451.
- Shih, M., Pittinsky, T. L., & Ambady, N. (1999). Stereotype susceptibility: Identity salience and shifts in quantitative performance. *Psychological science, 10*(1), 80-83.
- Suhr, J. A. & Wei, C. (2013). Symptoms as an excuse: Attention Deficit/Hyperactivity Disorder symptom reporting as an excuse for cognitive test performance in the context of evaluative threat. *Journal of Social and Clinical Psychology, 32*, 752-769.
- Swanson, H. L. & Sachs-Lee, C. (2001). Mathematical problem solving and working memory in children with learning disabilities: Both executive and phonological processes are important. *Journal of Experimental Child Psychology, 79*, 294-321.
- Wechsler, D. (1997). *Wechsler Memory Scale- Third Edition (WMS-III)*. San Antonio, TX: Psychological Corporation.

- Wei, C., & Suhr, J. A. (2015). Examination of the role of expectancies on task performance in college students concerned about ADHD. *Applied Neuropsychology: Adult, 22*, 1025-1047.
- Weyandt, L.L., Iwaszuk, W., Fulton, K., Ollerton, M., Beatty, N., Pouts, M., Schepman, S. & Greenlaw, C. (2003). The Internal Restlessness Scale: Performance of college students with and without ADHD. *Journal of Learning Disabilities, 36*, 382-389.

Table 1

Mean (Standard Deviation) or Percent for Participant Demographics by Condition

	Negative Stereotype Threat (n=10)	Positive Stereotype Threat (n=10)
Age	19.70 (0.95)	19.90 (1.20)
Gender (% Female)	50.00	70.00
Year in College	2.40 (0.84)	2.40 (1.17)
Age of Diagnosis	14.80 (4.32)	14.90 (4.33)
Time Since Last Dose of ADHD Medication (hours)	30.41 (42.77)	21.09 (24.93)

Table 2

Mean (Standard Deviation) Number of Questions Answered Correctly for Each Paragraph on the “Memory” Test by Condition

	Negative Stereotype Threat (n=10)	Positive Stereotype Threat (n=10)
Paragraph 1	2.80 (1.40)	3.40 (1.43)
Paragraph 2 (Stereotype Paragraph)	4.30 (0.82)	4.80 (0.42)
Paragraph 3	4.70 (0.48)	4.80 (0.63)

Table 3

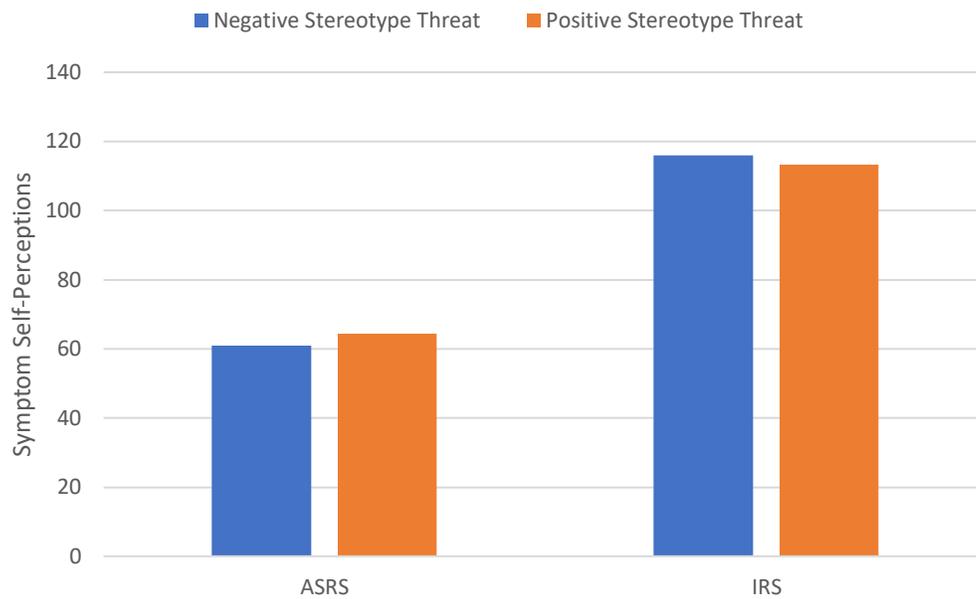
Correlations between Symptom Self-Perceptions and Performance Expectations and Working Memory Performance as well as Between Performance Expectations and Actual Test Scores

	Dual 2 Back Errors			LNS			PASAT		
	Pre	Score	Post	Pre	Score	Post	Pre	Score	Post
ASRS	-.629**	.409	-.458*	-.275	-.114	-.528*	-.503*	-.311	-.303
IRS	-.566*	.152	-.418	-.334	-.147	-.700**	-.362	-.196	-.452
		Score			Score		Score		
Prediction		-.401			.397			.433	
Postdiction		-.366			.324			.565**	

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

A.



B.

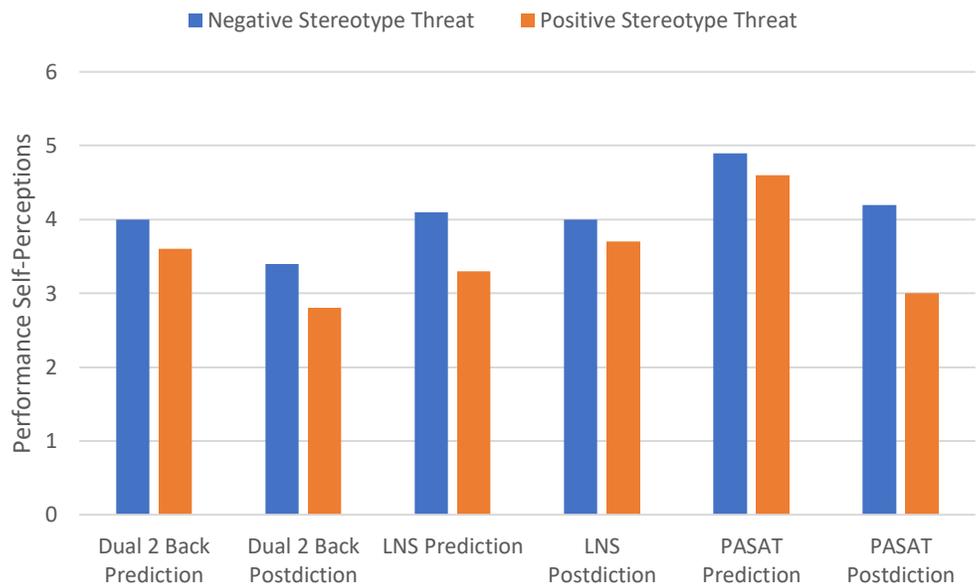


Figure 1. The impact of negative (blue bars) versus positive (orange bars) stereotype threat on symptom self-perceptions (A) and on performance self-perceptions (B). There were no significant differences between the two conditions on any of these measures.

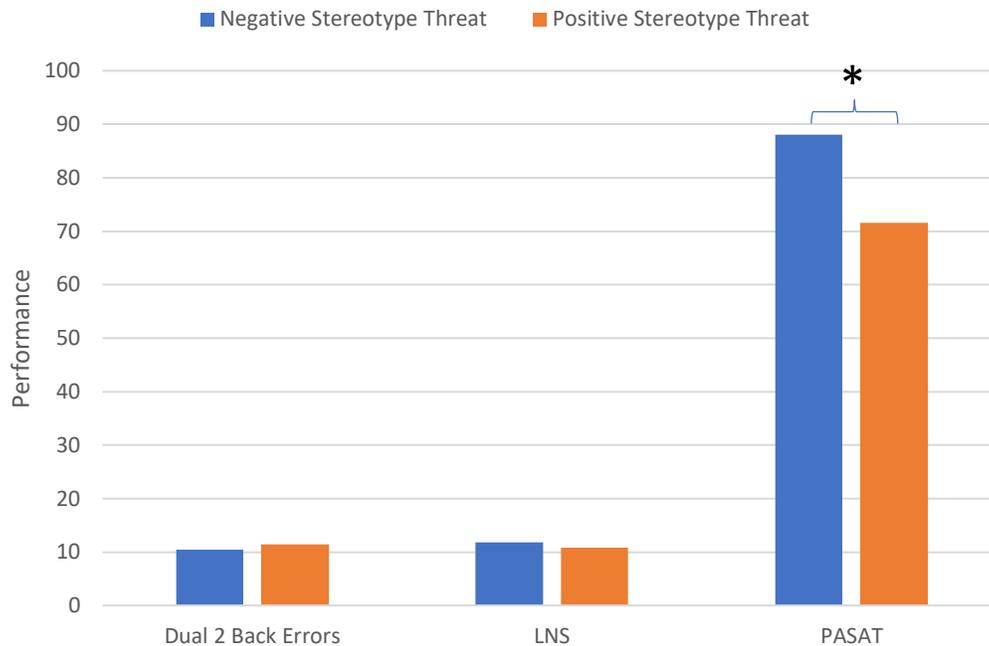


Figure 2. The impact of negative (blue bars) versus positive (orange bars) stereotype threat on working memory performance. There were no significant differences between the two conditions on the Dual 2 Back and LNS, but participants in the negative stereotype condition significantly outperformed those in the positive stereotype threat condition on the PASAT.

* Mean difference is significant at the .05 level

Appendix A

Negative Stereotype Threat Paragraph

Deficits associated with Attention Deficit Hyperactivity Disorder

Empirical evidence shows that Attention Deficit Hyperactivity Disorder (ADHD) negatively affects those who suffer from this mental illness. The rate of emotional development for children with ADHD is as much as 30% slower than it is for children without the condition. For example, a 10 year old with ADHD operates at the maturity level of about a 7 year old; a 16 year old beginning driver is using the decision making skills of an 11 or 12 year old. 30% of teens with ADHD have failed or have had to repeat a year of school. 35% of teens with ADHD eventually drop out of school. Of the parents with a child or children with ADHD, 44% reported their children to be dissatisfied with their school life, with responses ranging from slightly to extremely dissatisfied. Additionally, 41% described their children as dissatisfied with their social life using the same scale.

Appendix B

Positive Stereotype Threat Paragraph

Positive outcomes associated with Attention Deficit Hyperactivity Disorder

Recent research indicates that after receiving appropriate treatment, most children with Attention Deficit Hyperactivity Disorder (ADHD) experience a dramatic turnaround. These children are able to focus, and even those with hyperactivity or impulsivity are able to pay attention in classroom lessons, according to the ADHD Awareness Coalition. Scientists that have shown positive results advise that it is important to identify successful strategies, resulting in remarkable levels of functioning. Some studies had participants compile a list of 50-60 different techniques that they know work for them. When called on to perform and become engaged, these participants then understood which techniques are most beneficial. These strategies have been shown to work for many individuals with ADHD, because they allow them to step back and figure out the approaches they need to take to succeed. This provides lifelong help because it encourages those with ADHD to build on the many strengths they already possess.