Predicting High School Freshmen Dropout Through Attentional Biases and Initial Grade Point Average

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Abstract: *The authors examined the predictive nature of attentional biases and initial grade point average of ninth graders dropping out of high school. Attentional biases are cognitive shifts in focus that are linked in both time and context toward stimuli perceived by an individual as threatening. Data were collected from 68 high school freshmen (45.6% male; 2.9% African-American, 77.9% Caucasian, 7.4% Hispanic, 4.4% Native American, 7.4% Other) who participated in a longitudinal study beginning in their freshman year of high school and ending when students either graduated from or dropped out of high school. We determined if youth who subsequently graduated or dropped out of high school showed attentional biases toward school-neutral and school-threatening cues. Study participants completed a computerized probe detection task design, which measured participants' reactivity to possible attentional biases. Using logistic regression, we found attentional biases toward school-related cues and ninth-grade initial grade point average were significant predictors ($p < .05$) that increased the odds of students dropping out of high school. We discuss the implications of the findings for investigating attentional biases among school-based, non-clinical populations and use of attention biases screening to improve provision of interventions for students at risk of dropping out of school.*

The United States is facing a school dropout crisis, with an estimated 2.2 million members of the 2013 high school graduating class not earning diplomas (U.S. Census Bureau, 2013). Moreover, the U.S. annual dropout rate ranges from approximately 7–30%, depending on the ethnic group studied (Bowers, Sprott, & Taff, 2013; Hickman & Heinrich, 2011; Hickman, Bartholomew, Mathwig, & Heinrich, 2008; Schoenberger, 2012). Although researchers use different methods to calculate high school dropout rates, it is estimated that one in four high school students drops out of school (Hickman & Heinrich, 2011).

Such findings from prior researchers support recent research by Rumberger (2013) that high school dropouts, compared to high school graduates, face extremely bleak economic and social prospects. By comparison, high school dropouts are less likely to find a job and earn a decent living wage, more likely to be below the poverty level, and more likely to suffer from a variety of adverse health outcomes. Rumberger further noted that dropouts are more likely to rely on public assistance, engage in crime, and generate other social costs supported by taxpayers. Despite extensive research efforts, dropout activity still presents a pressing social concern about these at-risk youths and the significant expense for adults without high school graduation credentials and society (Rumberger, 2013).

While legislators and stakeholders increasingly hold school educators accountable for improving graduation rates, there are a large number of additional known factors, referred to as the "usual suspects," that are moderators of student success (Hickman et al., 2008). These other factors, such as family and community dynamics as well as student cognitive capacity, are often beyond the scope of school staffs' intervention efforts (Hickman & Heinrich, 2011; Rumberger, 2013). Given such, extensive research among educators has focused on contributing dropout factors they can control, namely academic issues such as grades, courses, core subjects standardized testing, attendance, etc. (Frostad, Pijl, & Mjaavatn, 2015; Irby & Mawhinney, 2014; Madaus, Grigal, & Hughes, 2014; Mahoney, 2014; Maynard, Kjellstrand, & Thompson, 2013). Of particular interest to educators is the importance of a student's grade point average (Hickman & Heinrich, 2011). The authors note that student grade point average tends to be examined and used as benchmarks, criteria, and qualifications for student progress; school funding; admission to various educational, community, and behavioral programs; interventions and treatment; and admission to many postsecondary educational institutions.

Perhaps interest in grade point averages originated from historical research that linked student grades to motivation, self-efficacy, self-esteem, behavior referrals, school suspensions and expulsions, incarceration, attendance, truancy, grade retention, and dropping out of high school (Glueck & Glueck, 1950; Sampson & Laub, 1995). Though such current and historical research contributes to our understanding of the importance of student grade point average and dropping out of high school, such research tends to be cross-sectional, *ex post facto*, and retrospective in nature as opposed to longitudinally tracking cohorts of ninth-grade students' initial grade point average as a key baseline predictor of dropping out of high school.

In addition to overlooking the longitudinal predictive ability of ninth-grade students' initial grade point average, researchers have also overlooked the impact of *attentional biases* or internal cognitive processes on the child's ultimate decision to drop out. Attentional biases are cognitive shifts in focus that are linked in both time and context toward stimuli perceived by an individual as threatening (Bosmans, Koster, Vandevivere, Braet, & Raedt, 2013; Cisler, Bacon, & Williams, 2009; Gilbert, Martin, & Coulson, 2011). For example, a child diagnosed with an anxiety disorder will have a tendency to demonstrate an attentional bias or cognitive shift towards social cues (i.e., dating, friends, school) and physical cues (i.e., hospital, fight, bullying) he or she perceives as threatening (Lonigan

& Vasey, 2009). Lonigan and Vasey (2009) noted that those children have a tendency to focus on or be hypervigilant toward such cues and that attentional biases can lead to cognitive errors, which can further lead to psychological and behavioral difficulties.

Researchers use a Probe Detection Task to measure attentional biases toward words considered to be threatening stimuli (Cisler et al., 2009; Vasey, Daleiden, Williams, & Brown, 1995; Vasey, El-Hag, & Daleiden, 1996). Using a list of both neutral and threatening words, the Probe Detection Task randomly lists two words briefly on computer screens, one word adjacent to the other, after which a probe (i.e., equivalent to a bullet point) would appear in lieu of one of the words—the proctor instructs test participants to press joystick levers when noticing the probes (Cisler et al., 2009). The response/reactivity times, measured in milliseconds, between neutral and threatening word-probe responses represent attentional biases (Cisler et al., 2009). Cisler et al. (2009) found that participants with clinically diagnosed anxiety and behavioral issues reacted more quickly to threatening words (e.g., *fear* and *trouble*) compared to neutral words (e.g., *word* and *time*).

Attentional biases, or the cognitive shift of directing attention and/or thoughts toward aversive and or anxiety-producing stimuli, is an emerging area of focus for child and adolescent developmental research (Bardeen, Dixon-Gordon, Tull, Lyons, & Gratz, 2014; Belcher, 2014; Perlman, Hein, & Stepp, 2014). For example, attentional bias researchers (e.g., Lonigan & Vasey, 2009; Lonigan, Vasey, Phillips, & Hazen, 2004; Schippell, Vasey, Cravens-Brown, & Bretveld, 2003; Vasey et al., 1995; Vasey et al., 1996) have focused on youth receiving behavioral health support and comparing responses to neutral and threatening stimuli with variables such as academic performance, social skills, and risky behavior. As a result, they found that youth alter emotions and attention and display attentional biases when presented with threatening stimuli. Other researchers have also found youth with test anxiety and reactive aggression likewise demonstrate attentional biases toward threatening words (e.g., *test* and *grade*; Schippell et al., 2003; Vasey et al., 1996). Finally, using a Probe Detection Test, Lonigan and Vasey (2009) examined reaction to aversive- and anxiety-producing stimuli as adolescents responded to reading social threatening (e.g., *teased* and *hated*); physical threatening (e.g., *danger* and *kidnapped*); and nonthreatening (e.g., *color* and *light*) words on a computer by clicking a handheld joystick. The authors found that adolescents with high negative affectivity, which refers to a sensitivity to negative stimuli, demonstrated attentional biases by responding more quickly to aversive and/or anxiety-producing words compared to neutral words. In other words, such adolescents have a tendency to focus on or be hypervigilant to such cues.

Problem Statement

Although the aforementioned researchers illuminate important findings regarding grade point average, attentional biases, and high school dropouts, the findings were from research that primarily used clinical samples of children and adolescents diagnosed with various mental health disorders as opposed to nonclinical samples of children and adolescents who were not clinically diagnosed with mental health disorders. Furthermore, while researchers have clearly demonstrated that grade point average is a robust predictor of academic success (Bowers, 2010; Young, Worrell, & Gabelko, 2011), there is a gap in the literature that has not longitudinally examined a nonclinical cohort of ninth-grade students' initial grade point averages and attentional biases as baseline predictors of dropping out of high school. Given such, further research is warranted that could examine this lack of research in an effort to address the documented, ongoing, and pervasive problem of high school dropouts (Heckman & LaFontaine, 2010; Hickman & Heinrich, 2011; Lessard, Butler-Kisber, Fortin, & Marcotte, 2014).

Purpose/Research Questions

The purpose of this quantitative longitudinal study was to assess the extent to which attentional biases toward school-neutral and aversive/threatening cues and initial high school grade point average predicted the likelihood of dropping out of high school. The authors conducted a longitudinal study using a sample of 68 ninth-grade high school students and tracked this cohort to the point of either graduation or dropout. As GPA is a strong indicator of subsequent school graduation and dropout activity (Hickman et al., 2008), we integrated ninth-grade students' initial GPAs as a variable into the study to help assess the baseline predictability of initial GPAs in conjunction with the potential relative strength of attentional biases as part of the findings. Using logistic regression to address the purpose of our study, we proposed the following research question: What is the predictive relationship of initial grade point average and attentional biases among high school freshmen in dropping out of high school?

Method

Participants

The longitudinal research took place in one high school district in rural eastern Arizona from 2008–2011. The cohort of 68 high school freshmen who participated in this longitudinal study was followed throughout the high school years—from the start of ninth grade through the expected graduation date. Of the 68 participants, 53 graduated from and 15 dropped out of high school. Gender of the participants was equally representative of school demographics, with female students comprising 54.4% of the sample. Furthermore, ethnicity of participants included 77.9% Caucasian-American; 7.4% Hispanic; 4.4% Native American; 2.9% African American; and 7.5% Other. These demographic figures are representative of the school and close to the state of Arizona demographics. Hence, this study was not delimited to rural eastern Arizona. See Table 1 for a complete summary of demographic variables.

Table 1

Demographic Characteristics of Participants

Variable	n	%
Gender		
Male	31	45.60
Female	37	54.40
Ethnicity		
African-American	2	2.90
Caucasian	53	77.90
Hispanic	5	7.40
Native American	3	4.40
Other	5	7.40
High School Status		
Graduated High School	53	77.94
Dropped Out of School or the Program	15	22.06

Procedures and Measures

With the permission of school administration, an entire high school cohort participated in this study. All 79 available ninth-grade students and their parents agreed and signed informed consent forms that indicated the study was voluntary, participation was not required for any school related activities and grades, and the adolescent participants could withdraw from the study at any point in time. Although all 79 parents and children agreed to participate in the study, six students were absent during the testing period, two did not complete the probe detection task, and three students departed the school district with "unknown graduate status," leaving a data sample size of 68 students or 88.31% of the original incoming freshmen high school cohort. The calculated sample size for logistic regression analysis using G*Power was 65 participants (Faul, Erdfelder, Buchner, & Lang, 2009). Thus, our sample size was appropriate.

The study took place over a two-day period in the nurse's office at the high school. This location was remote from student, faculty, and administrator activities. Participants came to the office one at a time, where we asked each student to complete the attentional bias probe detection task. The average time of completion per participant was approximately 20 min.

Probe detection task. Participants completed a computerized probe detection task using E-Prime 2 Professional Software to measure reactivity to stimuli created by Psychological Software Tools located in Pittsburgh, Pennsylvania (Schneider, Eschman, & Zuccolotto, 2012). The computer testing location was situated in a quiet room in the back of the nurse's office to avoid any possible distractions. Participants sat approximately three feet in front of the 15-inch Dell laptop computer from which they were tested. The experimenter read the task instructions to each participant before asking them to read the instructions independently in an effort to ensure clarification. The instructions read:

> This computer program tests your reactivity. During this test, you will see a small cross centered on the screen. Please focus your attention on this cross. Shortly after you see the cross, two words will appear on the screen, one on top of the cross and one below the cross. A few seconds later, these words will disappear, being replaced by a small dot probe. As soon as you see the small dot, press the number "1" if the dot replaced the upper word and the number "3" if the dot replaced the lower word. This is how the computer measures your reactivity, so press the appropriate keys as fast as you can. Repeat this process until the computer tells you that you are finished. If you do not understand these instructions, please notify the experimenter now. If you are ready to practice, click the number "1" now.

After a 10 word pair practice trial to acquaint participants with the computerized task, students were then prompted to begin the experimental section of the study. This section consisted of 120 trials (60 threat trials, 60 neutral trials) separated at the center of the testing screen by approximately 3 cm and a fixation cross. Threat trials consisted of one school-related word (selected as the potentially threatening words in our study) and one neutral word. Neutral trials contained two neutral words and served as both filler trials to prevent participants from identifying our experimental objective and control trials from which to establish a baseline for comparison. We established content validity for the threat and neutral words by an extensive review from school administrators based on their expertise of school words/cues that graduates and dropouts would perceive as threatening.

We matched all word pairs, both neutral and threatening, for length (i.e., number of letters), as well as vetted and pretested with school administrators for strength of neutrality and threat (see Table 2 for complete word list). All word pairs appeared centered on the computer screen for exactly 1,500 ms (long enough for participant word comprehension) before a small dot probe replaced one of the two displayed words, just 25 ms after their disappearance. Based on seminal research by Vasey, Daleiden, Williams, and Brown (1995), this time length is deemed long enough for strategic capture of control for attention and comprehension among children and adolescents. All trials contained a dot probe stimulus following the disappearance of the word pair display. At this point, participants were measured on reaction time to the dot probe stimulus by clicking one of two predetermined "hot keys" that corresponded with the dot probe location (1 = *probe replacing upper word*, 3 = *probe replacing lower word*).

Table 2

List of Probed Threat and Neutral Word Pairs

Threat Word	Neutral Word	Threat Word	Neutral Word
Grades	Coffee	Notebook	Umbrella
Attendance	Dishwasher	Study	Broom
AIMS*	Mail	Graduate	Clothing
Quiz	Farm	Test	Door
Spelling	Magazine	Detention	Watermelon
Decimal	Sunrise	Tardy	Booth
Project	Laundry	Calculator	Sunglasses
Desk	Bird	Diploma	Pumpkin
Learn	Float	Homeroom	Director
Writing	Cupcake	Subject	Candle
Substitute	Vegetable	History	Blanket
Pupil	Stove	Report	Powder
Classroom	Apartment	Novel	Acorn
Paper	Toast	Fail	Duck
Dropout	Picture	Globe	Outer
Backpack	Building	Principal	Fireplace
Semester	Necklace	Math	Corn
Exam	Boat	Library	Popcorn
Homework	Mattress	Student	Preview
Class	Tooth	Discipline	Television
Pencil	Mouse	Assignment	Eyeglasses
Cafeteria	Checkbook	Enroll	Basket
Textbook	Cranberry	GPA	Eye
Lecture	Window	Reading	Compact
School	Button	Books	Lemon
Teacher	Sailboat	Freshman	Doorbell
Bus	Toe	Flashcard	Yesterday
Vocabulary	Peppermint	Noun	Milk

*AIMS is the Arizona State High School Exit Exam.

The independent variable, attentional bias, was interval scaled and recorded in milliseconds that ranged potentially from 250 ms (fastest possible time) to 1,500 ms (slowest possible time). Reactivity times below 250 ms were deemed too quick (i.e., premature response), while reactivity times above 1,500 ms were deemed too slow (i.e., delayed response) for statistical comparison (Vasey et al., 1995); therefore, we dropped these response times from the analysis. Only three reactive response times were below 250 ms and above 1,500 ms.

Subsequent word pairs were displayed 50 ms after we recorded previous word pair responses. We presented all 120 word pairs under these criteria, and E-Prime software recorded all of the data for each trial.

Grade point average (GPA). Using official school transcripts, we recorded participants' GPAs. GPAs ranged from 0.00–4.00. We recorded GPA from official transcripts in hundredths (e.g., 2.57, 3.68, 3.75). Initial GPAs were collected after the first semester of participants' freshman year and collected longitudinally at each quarter and semester to the point of dropping out of high school or graduating from high school. The independent variable GPA was ratio scaled, and all participants ranged between 0.00 and 4.00.

Dropout and graduation status. Using official school transcripts, we recorded each participant's final status of dropping out of high school or graduating from high school. Official transcripts contained the "W," or withdraw code, for those who dropped out of school and also indicated those participants who graduated from high school. The dependent variable was nominal scaled and was coded as 0 = graduates and 1 = dropouts.

Results

Logistic regression was used to analyze the data and answer the research question: What is the predictive relationship of initial grade point average and attentional biases among high school freshmen in dropping out of high school? We present in Table 3 the means and standard deviations of the independent variables initial GPA and response time of attentional biases to threatening school-related cues and the dependent variable of high school completion status. In addition, Table 4 contains a correlation matrix of the predictor variables.

The independent variables of initial grade point average and attentional biases accounted for the logistic regression equation and were entered simultaneously as predictors of whether one dropped out of or graduated from high school. More specifically, holding all other independent variables constant, for a one-unit increase (*SD* = .83) in initial grade point average, the odds of dropping out of high school are decreased by approximately 8%. In addition, holding all other independent variables constant, for a one-unit increase (*SD* = 192.01) in response time of attentional biases to threatening school cues, the odds of dropping out of school are increased by approximately 4%. Overall, the model chi-square was found to be significant ($\chi^2 = 24.86$, $df = 1$, $p < .001$). Moreover, Nagelkerke pseudo R^2 indicated a high goodness of fit, as the model accounted for 50% of the variance. See Table 5 for a summary of the logistic regression equation variables.

A 2 x 2 classification table was used to examine the baseline prediction of dropping out of high school and the prediction of dropping out of high school after we entered the logistic regression equation model. The baseline model predicted a correct classification of approximately 80%. After we examined the logistic regression equation, the model predicted a correct classification of approximately 90%. Hence, the logistic regression equation model increased the correct classification of predicting high school dropouts by 12.5 percentage points. Finally, a proportional reduction in error statistic was examined to further support the classification table. More specifically, there were approximately 30% fewer errors when predicting high school dropouts using the logistic regression model, compared to predicting high school dropouts without the logistic regression model. See Table 6 for a complete summary.

Discussion

The rationale for this study was threefold. First, we wanted to extend the literature regarding attentional biases to the educational arena, specifically to high school dropouts.

Second, we wanted to extend the literature regarding attentional biases from a clinically diagnosed population to a nonclinical population. The rationale for such was to see if the findings from research regarding clinically diagnosed samples held true for a nonclinical sample in shifting one's attention toward threatening cues. Finally, we wanted to longitudinally examine the student's initial GPA in high school as a baseline predictor of whether a student drops out or graduates from high school. As it turns out, our study confirmed and disconfirmed prior research regarding the variables of attentional biases and initial grade point average.

Our research confirmed what previous researchers (e.g., Hickman et al., 2008; Young et al., 2011) have demonstrated in that GPA is a powerful predictor of success. Indeed, we found that for every one unit increase (*SD* = .83) in initial GPA, the odds of graduating increased by 8%. We also found that graduates' initial ninth-grade first semester GPAs (M = 3.06) were no different than their final GPAs (M = 3.07) when they graduated high school. Dropouts' initial ninth-grade first semester GPAs (M = 1.92) were not significantly different than their final GPAs (M = 2.10) when they dropped out of high school. Such findings support research by Hickman et al. (2008) in that regardless of whether a student drops out or graduates from high school, the student's GPA does not significantly vary from the initial ninth-grade first semester GPA.

Interestingly, regardless of whether a student drops out or graduates from high school, the student's initial high school GPA does not vary much over time during his or her educational tenure in high school. Such findings suggest that ninth-grade freshmen students' outcomes in high school could be a product of their educational experiences, development, and progress over their first eight years of education. This

Table 3

Means and Standard Deviations of Variables

	Dropouts		Graduates	
Variable	M	SD	M	SD
Initial GPA	1.92	.83	3.06	.62
Probe Detection Task*	625.01	329.75	494.90	132.64

*Time in milliseconds.

Table 4

Correlation Matrix of Variables

	GPA	Probe Task
GPA	1.000	
Probe Task	-.434	1.000

Table 5

Logistic Regression: Predicting Program Completion

Variables	Coefficient	Statistic	*p*	Exp(B)[1]
Grade Point Average	-2.384	10.243	.000	0.92
Probe Detection Task*	.004	4.757	.029	1.04

[1]Factor by which the odds of dropping out of school increase or decrease for a one-unit increase in the independent variable. Model Chi-Square = 24.86; $df = 1$; $p < .001$.

Table 6

Classification Table: Predicting Program Completion

Observe	Graduated	Dropped Out	Percent Correct
Graduated	51	2	96.2%
Dropped Out	5	8	61.5%
Overall % Correct			89.4%

suggests that the educational system may not be able to significantly overcome prior academic development given that both dropouts and graduates did not significantly increase or decrease GPA over time. Clearly, it appears that the educational foundation that students bring to high school is important in predicting if one will drop out or graduate from high school as evident in this longitudinal study and in prior longitudinal research (Hickman et al., 2008). Such an inability for the education system to significantly help students increase grade point averages over time during their high school tenure should be a concern for educators, students, and parents, as many postsecondary institutions base admission processes on GPA (Turner & Croucher, 2014).

Our research also confirmed and disconfirmed the results from previous seminal researchers (e.g., Schippell et al., 2003; Vasey et al., 1996) regarding attentional biases of threatening cues among adolescents. More specifically, our research confirmed that adolescents who demonstrate an attentional bias toward threatening cues significantly predicted various outcomes. In our study, it was clear that those adolescents who demonstrated an attentional bias toward school-related cues as being more threatening were significantly more likely to drop out of school. Although four percent is not as much of a robust predictor as initial ninth-grade first semester GPA (i.e., 8%) at predicting and better classifying dropouts, attentional biases of school-related cues as being perceived as threatening were still a significant predictor and increased the odds of dropping out.

Although not part of the original purpose of our study, we conducted post hoc analyses to examine the differences in the reactions of school- and neutral-word cues between graduates and dropouts as we thought such analyses would elucidate the findings from our logistic regression model. A post hoc *t*-test analysis demonstrated significant differences in the reaction speed of the probe detection task to school-related threatening cues between those students who would eventually drop out (M = 625.01 ms) and graduate (M = 494.09 ms) from high school, $t(64) = -2.257$, $p < .05$. That is, those who would eventually drop out of high school responded significantly slower to school-related probed threat cues than those who would eventually graduate high school. Interestingly, a post hoc *t*-test analysis did not demonstrate significant differences in the reaction speed to probed neutral words unrelated to school cues between those who would eventually drop out (M = 591.63 ms) and graduate (M = 494.09 ms), $t(64) = -1.454$, $p > .05$.

It is interesting to note that of the 60 probed threat cues, the cue word *dropout* had the slowest response time (e.g., 588.85 ms) both for those freshmen who would eventually drop out of and those who would graduate from high school. Moreover, the differential response time to the threat cue of *dropout* was the largest differential margin of all 60 probed threat cues at 780.92 ms for those freshmen who would eventually dropout of school and 541.74 ms for those freshmen who would eventually graduate from high school. Indeed, the response time to *dropout* was much slower than the other threat cues. Such findings suggest an attentional bias or shift away from a threatening cue that resonates with their current cognitive processing in ninth grade and one that longitudinally predicts the outcome of those who will eventually drop out of school. With the probe detection task being presented at speeds that mirror the speed and accuracy of one's actual thought processes at a given moment, this supports research which linked thought processes in predicting behavior in past research (e.g., Reinecke, Waldenmaier, Cooper, & Harmer, 2013) and in our research.

Our findings contradict prior research of attentional biases as discussed above in that our sample did not have an attentional bias shift *toward* the probed threatening cue; rather, participants made an attentional bias shift *away from* the probed threatening cue. That is, in past studies, the at-risk populations (e.g., clinical populations) demonstrated an attentional bias shift *toward* a probed threatening cue by responding more quickly to probed threatening cues whereas in our study, our at-risk population—students who eventually dropped out of high school—responded more slowly to probed threatening cues. In our study, it was clear that those adolescents who demonstrated an attentional bias shift *away* from school-related cues were significantly more likely to drop out of school.

The question becomes why, in our sample, did the at-risk students who dropped out of school respond slower or shift their attention *away from* probed threatening cues when other at-risk populations tend to respond quicker or shift their attention *toward* probed threatening cues? In the previously discussed research regarding attentional biases, the child and adolescent populations have been clinical populations, that is those students clinically diagnosed with various developmental and mental health disorders. However, our sample differed from prior research on attentional biases in that our participants were a nonclinical sample of mainstream high school students. Although researchers have clearly demonstrated that those adolescents who drop out of high school do experience the "usual suspects" of various problems and issues in their lives, not all are diagnosed clinically for various disorders (Hickman & Heinrich, 2011; Rumberger, 2013).

Implications and Conclusions

Our interpretation of the findings from this study suggests that attentional biases are not universal in application, but still may yield potentially significant behavioral and educational predictions. In addition to replicating this study across settings and populations to help extend and possibly corroborate the findings, future researchers may want to include nonclinical populations in and across school contexts for investigating possible attentional biases. Researchers may also want to examine attentional biases as a moderating variable that influences the relationship between grade point average and dropping out of school. Indeed, researchers have demonstrated that cognitive processes can have a moderating effect on various academic and behavior outcomes (Honicke & Broadbent, 2016; Molano, Jones, Brown, & Aber, 2013). In addition, future researchers may want to explore qualitative aspects

of attentional biases regarding threatening and neutral words, in and across school settings, as helpful means toward understanding the differences in responses. Our findings, albeit not in the anticipated direction found by previous researchers, remain significant based on differences in attentional biases for a nonclinical sample often encountered in high schools.

School staff such as school counselors and school psychologists and other professionals such as local special interest groups and researchers could increasingly target interventions for at-risk students if they could generally predict who is at significant risk of dropping out, via attentional biases screening. Also, as language and meanings are central teaching and learning concepts, our findings may alert school and other professionals to be mindful of framing school-based words in ways that are less threatening to students who are at risk of dropping out of school.

Finally, our findings align with the cognitive processes of disengaged youth at risk for dropping out of school (Blondal & Adalbjarnardottir, 2012; Lessard et al., 2014; Super & Murray, 2010). The dropouts had significantly slower responses to threatening school word prompts. Perhaps dropouts and students at-risk of dropping out find school-based, threatening terms as impeding cognitive aspects of school experiences. For example, qualitative research could discover if the attentional bias shift away from school-related cues is actually perceived as a threat cue for nonclinical populations. The fact that dropouts respond slower or shift their attention away from school related cues may be that school cues are processed slower as such students find school more threatening and thus cognitively dwell on school as being threatening. Hence, students at risk for dropping out of school may be unable to cognitively shift their attention away from school cues as these cues are threatening to them. In contrast, individuals in clinical samples shift their attention toward threatening cues.

Our findings are significant for noting attentional biases for a nonclinical population in a school setting. Dropout activity is a complex, systems-based phenomenon and contributing mediating factors are often detectable *post hoc* and/or *in vivo*; thus, school staff have poor and inconsistent ability to predict who will drop out of school (Bowers et al., 2013; Schoenberger, 2012). Offering school staff a tool to identify youth at risk for dropping out of school based on their attentional biases might provide a helpful resource that affords school staff the opportunity to be proactive and intervene early.

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