



RESEARCH ARTICLE

Defeatist Beliefs and Schizotypy in Adolescents and Emerging Adults

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Abstract

Defeatist beliefs involved overgeneralized negative beliefs regarding the ability to successfully perform tasks and accomplish goals. These cognitive errors have been shown to affect one's ability to accurately assess and react in social situations and serve as hallmarks of many mood disorders. These negative beliefs also exist at high rates in adults with schizophrenia spectrum diagnoses. There is evidence for these beliefs existing during prodromal periods in young adults at-risk for psychosis, especially if they exhibit motivational or interpersonal difficulties (negative symptoms). However, there is little known about when these beliefs first emerge and whether they predate clinical disorder during earlier life stages where only subclinical presentations of risk (schizotypy) may be present. To address this research gap and help to inform cognitive-behavioral interventions targeting defeatist belief structures, we investigated the relations between defeatist beliefs and schizotypy in a sample of adolescents and emerging adults. Participants were 86 high school students (ages 14-17) and 270 college students (ages 18-22). Participants completed a 30-minute, self-report survey on defeatist beliefs and schizotypy. Our analyses found little difference in mean or standard deviation in defeatist beliefs or schizotypy between our two samples, with a robust positive association ($r=0.46$) when the samples were aggregated. These findings suggest that defeatist beliefs correspond with subclinical risk more-or-less on a continuum during this wider period of life potentially helping to understand variability in symptom severity. Future research is needed to clarify the nature of this relationship and to inform future interventions. Our finding suggests that cognitive behavioral approaches, which are well suited to target and modify defeatist beliefs, could serve a preventative role in the risk for future psychosis in at-risk adolescents and emerging adults.

Keywords: Schizotypy; Defeatist Beliefs; Adolescents, Emerging Adults; Schizophrenia

INTRODUCTION

Defeatist beliefs, also known as dysfunctional attitudes or negative performance beliefs, are cognitive errors typified by an underestimation of one's ability to successfully navigate social interactions and perform goal-directed behaviors (Campellone, Sanchez, & Kring, 2016). Previous research has demonstrated the impact of defeatist beliefs in schizophrenia spectrum disorders, with particular emphasis on negative symptoms that are often medication-resistant (Kane, 1996; Kane 1999). Grant and Beck (2009) found that defeatist beliefs acted as a mediating variable between cognitive impairment,

negative symptomatology, and functional impairment in schizophrenia. Specifically, schizophrenia patients with more severe negative symptoms endorsed more defeatist beliefs, even after controlling for depression and positive psychotic symptoms, with defeatist beliefs mediating the relationship between negative psychotic symptoms and neurocognitive impairment (Grant & Beck, 2009). Subsequent research has extended these findings to illustrate the role of defeatist beliefs with impairments in functional capacity, independent living skills, and community functioning (Horan et al., 2010; Quinlan et al., 2014; Vaskinn et al., 2015). A pattern of downward spiral may exist where existing limitations in functional capacity increase defeatist beliefs, which then increase the negative psychotic symptoms of avolition and amotivation, which then in turn further impair real-world functioning (Horan et al., 2010). Couture and colleagues (2011) further clarified the role of defeatist beliefs, showing they influence the negative symptoms that reflect diminished experience (avolition, asociality, and anhedonia), but not diminished expressivity (flat affect, alogia) (Couture et al., 2011). This proposed downward spiral by which defeatist

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beliefs exacerbate psychotic illness has also been found to exacerbate internalized stigma (Park et al., 2013). Further, a recent meta-analytic review provided additional evidence that defeatist beliefs play a critical role in schizophrenia spectrum disorders, promoting the exacerbation of negative symptoms, impaired functional outcomes, and internalized stigma (Campellone et al., 2016). Similar findings are reported in young adults exhibiting subclinical psychosis risk indicators (schizotypy), where these dysfunctional beliefs partially mediate the relationship between symptom severity and levels of distress (Fervaha et al., 2015). Furthermore, increasing levels of defeatist beliefs may further encourage the individual to withdraw or disengage from their environment leading to worsening social and academic outcomes (i.e., cognitive models of schizophrenia; Luther et al., 2016; Luther et al., 2018).

However, relatively little is known about defeatist beliefs in adolescent samples with varying levels of subclinical risk for psychosis. This research gap is notable, given that adolescence is a developmental period of heightened risk for schizophrenia (Gomes et al., 2016; Harrop & Trower, 2008), with conversion to psychosis in at-risk adolescents estimated at about 8-28% (Hartmann et al., 2016; Nelson et al., 2016). Schizophrenia research is often complicated by the confounding influence of emerging or ongoing psychotic illness and antipsychotic medication effects (Kane, 1996; Rathod et al., 2008), which can be somewhat controlled by studying ultra-high-risk and first-episode populations that are typically antipsychotic medication-naïve (Perkins et al., 2005). To date, research in adolescents has been relatively limited, with preliminary studies finding associations between defeatist performance beliefs and negative symptoms of schizotypy in college students (Luther et al., 2018), heightened defeatist beliefs in ultra- and clinical-high-risk individuals (Perivoliotis et al., 2009; Devoe et al., 2021) and heightened defeatist beliefs in first-episode psychosis patients (Ventura et al., 2014). However, the influence of emerging psychotic illness remains a confounding factor in these preliminary studies, as ultra-high risk, clinical high risk and first-episode adolescent samples are, by definition, characterized by the presence of attenuated psychotic symptoms or a first psychotic break, respectively. To address this remaining confounding, schizotypy has been used in a variety of studies as a means of examining schizophrenia risk factors and outcomes without the confounding effects of either emerging psychotic illness or antipsychotic medication (Miller & Lenzenweger, 2012; Luther et al., 2016). Schizotypy has been primarily conceptualized as a personality framework found in the general population that reflects latent liability for schizophrenia (Meehl, 1962, 1990; Miller & Lenzenweger, 2012). To date, two studies have examined heightened levels of defeatist beliefs, with only one of these studies conducted in emerging adults (Luther et al., 2018), leaving this gap in the literature relatively unaddressed. The current study not only provides additional data on emerging adults, but also utilizes a high school sample, potentially elucidating how defeatist beliefs influence adolescents and how these relationships compare to those in emerging adults. Thus, it is critical to examine the relationship between schizotypy and defeatist beliefs in adolescents to help to inform the role that defeatist beliefs may play during periods of heightened developmental risk for schizophrenia.

Further, it can be argued that there is need for foundational research to inform the earliest possible age cohorts where defeatist beliefs can be effectively targeted

by treatment with cognitive-behavioral therapies. That is, the evidence base for treating defeatist beliefs in schizophrenia spectrum disorders has grown from the empirical groundwork linking defeatism to schizotypy and other schizophrenia spectrum manifestations principally in adults, and as a result, empirically grounded interventions have focused primarily on adults. Resulting cognitive-behavioral therapies targeting defeatist beliefs have, for example, either (1) applied already-existing social skills training to adult schizophrenia patients, or (2) used defeatist beliefs scale items to infer a priori the coping skills (e.g., coping through application of grit and perseverance) that would most impact adults' defeatist belief structures (Perivoliotis & Cather, 2009). Although preliminary trials in adult schizophrenia spectrum disorder patients using these adult-focused interventions have largely resulted in statistically-significant reductions in negative symptoms and improvement in social functioning (Klingberg et al., 2011; Granholm et al., 2013; Staring, ter Huurne, & van der Gaag, 2013; Granholm et al., 2014) and all but one trial (Velligan et al., 2015) demonstrated significant clinical improvement, effect sizes have only been moderate, not large. Thus, these limited effects in adults could indicate a possible role for preventative efforts in adolescence and young adulthood before the downward spiraling of defeatism crystallizes in adulthood (Horan et al., 2010). Foundational data in adolescent and young adult age groups that demonstrates a clear link between schizotypy and defeatism by avoiding confounds from medication and psychotic illness effects may help lay the empirical groundwork for this early intervention.

To address this research gap and lay the groundwork for the preventative targeting of defeatist belief structures, we investigated the relations between defeatist beliefs and schizotypy in a sample of adolescents and a sample of emerging adults. We tested two hypotheses: first, that defeatist beliefs would be similarly predictive of schizotypy in both adolescent and emerging adult samples, suggesting more-or-less a singular window of risk rather than two distinct epochs. Second that increased severity of defeatist beliefs would be related to increased interpersonal (or negative) schizotypy. If these hypotheses were not supported by the data, we would look at each sample independently and evaluate the fundamental between-sample differences or evidence for discrete developmental epochs. However, evidence for our main premise would provide conceptual support for extending the possible window of preventative action to late adolescence.

METHODS

Procedure

A total of 422 high school students (i.e. adolescents; ages 14-17) and college students (i.e., emerging adults; ages 18-22) completed questionnaires including defeatist beliefs and schizotypal personality. The age range of the high school represents a period of heightened risk for schizophrenia compared to earlier ages (Musket et al., 2020; Maibing et al., 2015). The high school sample data was collected by author SE as a high school senior, overseen by under a high school science teacher in collaboration with author GN. A formal proposal was submitted for review to the school's IRB and to author GN's university. The emerging adult portion of the project underwent a separate IRB review at author TD's

university. Both studies were approved, with written informed consent/assent occurring prior to data collection. Participation was voluntary with the ability to decline without consequences. High school students completed the survey in the room with a researcher, and college students were provided with contact information for the research team, allowing them to ask clarifying questions regarding the consent form and their participation. While the high school students were not compensated for their participation the college students received participation credit in an introductory psychology course. High school data was collected in a paper-pencil format while the college student data was collected via an online Qualtrics survey. Four infrequency items were embedded to identify random/inconsistent responding (e.g., "I walk with a limp due to a skydiving accident"). Students that endorsed 2 or more of these items were dropped from later analyses (n=66). The final sample included 86 high school students (65% female) and 270 undergraduate students (50% female).

Measures

Assessment of Schizotypy

Variants of a widely used questionnaire were used to measure risk for psychosis, both to help ensure anonymity within our data collection protocols, but also to better ensure our findings could be contextualized by an extensive existing literature. The 22-item Schizotypal Personality Questionnaire Brief (SPQ-B) was used to measure schizotypy in the high school sample. The SPQ-Brief is used for identifying individuals who are at risk for developing schizophrenia and related disorders, where items are answered in a 'yes/no' format. This scale has been shown to have good internal consistency in both adolescent ($\alpha = 0.68-.080$) and young adult samples ($\alpha = 0.84-0.96$) (Compton, Goulding, Bakeman, & McClure-Tone, 2009; Wuthrich & Bates, 2005; Fekih-Romdhane, Stambouli, Cherif, Away, Amri...& Hallit, 2023). The Schizotypal Personality Questionnaire Brief Revised (SPQ-BR) was used to measure schizotypy in the undergraduate sample. This 32 item-measure runs on a 5-point Likert scale ranging from 0 ("Strongly Disagree") to 4 ("Strongly Agree") with established internal consistency (Cronbach's $\alpha = .80-.90$) (Cohen, 2010; Callaway et al., 2014). Total scores were normalized (z-transformed) using male and female means/standard deviations (separately) to allow direct comparisons between samples.

Assessment of Defeatist Performance Beliefs.

Defeatist beliefs were measured using the Defeatist Performance Beliefs Subscale from the Dysfunctional Attitudes Scale (Weissman, & Beck, 1978). The Defeatist Beliefs Scale is a subscale within Beck's Dysfunctional Attitudes Scale. It is a 15-item measure using a 6-point Likert scale. The Likert scale is anchored in "Totally agree" and "Totally disagree." This scale has established internal consistency (Cronbach's $\alpha = 0.85$) (Couture, Blanchard, & Bennett, 2011).

Statistical Analysis

Prior to analyses all data was examined for completeness and evidence of outliers and points of high leverage or influence. We plotted univariate distributions of our variables of interest and examined assumptions of

normality, independence, and homogeneity. Schizotypy (SPQ) scores were z-transformed and plotted for comparison while an independent t-test was used to compare defeatist belief mean scores between groups. This test would elucidate if the adolescent and emerging adult samples were distinct (i.e., meaningfully different schizotypy and/or defeatist beliefs scores) and needed to be examined separately, or if they should be examined on a continuum, as one larger sample. A p-value below 0.05 was used as a decision criterion to determine if the samples were distinct. Pearson's bivariate correlations were used to examine relationships between defeatist beliefs and levels of schizotypy. Linear regression models were created to determine the variance accounted by defeatist belief scores on levels of schizotypy while controlling for demographic variability.

RESULTS

Between Sample Comparisons

Independent t-test comparisons for defeatist beliefs between samples were non-significant ($t(354) = -.361$, $p = .72$; Cohen's $D = -0.045[-0.2, 0.29]$). Similarly, examination of plotted mean/error scores demonstrated only nominal between-group differences in defeatist beliefs or schizotypy between our two samples (see Figures 1-2). The lack of statistical significance between these samples in both defeatist beliefs and schizotypy subscale scores provided evidence that the data are best viewed on a single continuum and should be pooled together in subsequent within-subject analyses of the study. Additional evidence supporting this interpretation can be seen in the similar, and significant, positive correlations between levels of schizotypy and defeatist beliefs that were found in both the adolescent and emerging adult samples ($r = 0.51$; $r = 0.45$, both $p < .001$; see Figure 3).

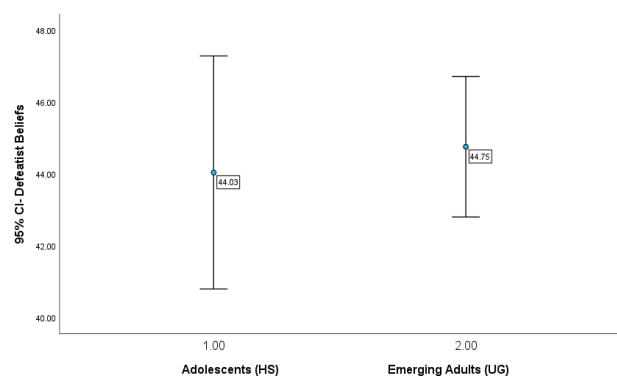


Figure 1: Defeatist belief mean scores (95% confidence intervals) in high school adolescents (n=86) and undergraduate emerging adults (n=270)

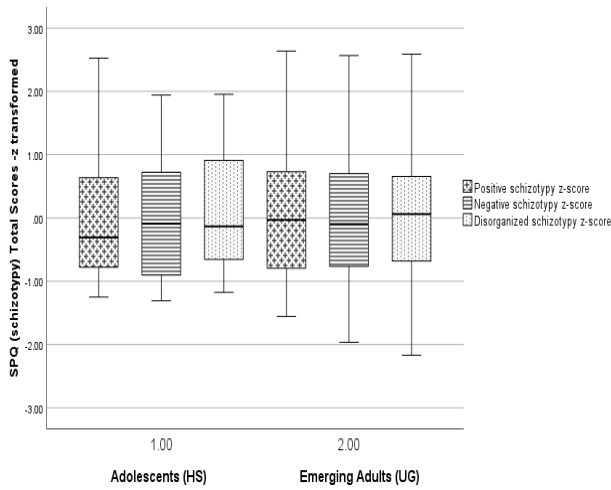


Figure 2. Box plots with error bars: Positive, negative, and disorganized schizotypy (z-transformed) in adolescents (n=86) and emerging adults (n=270)

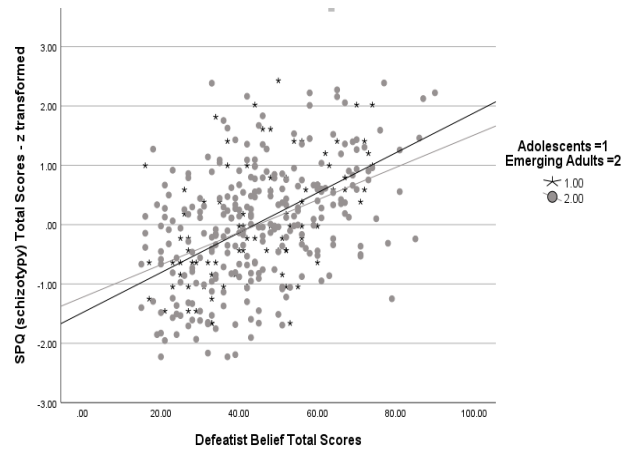


Figure 3. Scatterplot comparing the relationship between schizotypy total scores and defeatist beliefs between adolescents and emerging adults

Table 1: Standardized beta weights (β) from hierarchical linear regressions predicting schizotypy symptoms

Model	Total		Schizotypy		Negative schizotypy		Positive schizotypy		Disorganized schizotypy	
	β	t	β	t	β	t	β	t	β	t
Step 1										
Age	.012	.226	.014	.258	-.043	-.792	.056	1.009		
Sex	.016	.286	.015	.275	.082	1.508	-.051	-.928		
Ethnicity	.078	1.459	.071	1.315	.124	2.338*	.004	.072		
Step 2										
Age	.007	.152	.009	.187	-.047	-.906	.052	1.002		
Sex	.043	.882	.042	.869	.101	1.967*	-.029	-.576		
Ethnicity	.039	.817	.032	.657	.097	1.914	-.026	-.524		
Defeatist Beliefs	.459	9.639***	.458	9.627***	.324	6.472***	.355	7.104***		

Within-sample comparisons

Given the notable similarities between the samples, we elected to combine our participants into a unitary sample to evaluate the predictive value of defeatist beliefs on levels of schizotypy. We constructed 4 separate models for the three schizotypy subscales (positive, negative, disorganized) and total schizotypy. Each model contained two steps containing (1) demographic factors of sex, ethnicity, and age, and (2) defeatist belief total scores. Defeatist beliefs significantly predicted levels of schizotypy in each model (see Table 1). For *total schizotypy*, demographic variables (Step 1) did not contribute to the model [$R^2\Delta = .007$, $F(3, 352) = .791$, NS] while defeatist beliefs (Step 2) contributed to approximately 21% of the total schizotypy variance [$R^2\Delta = .208$, $F(1, 351) = 23.977$, $p < .001$]. The schizotypy subscale models followed a similar pattern; *negative schizotypy* (step 1) [$R^2\Delta = .006$, $F(3, 352) = .659$, NS]; (step 2) [$R^2\Delta = .208$, $F(1, 351) = 92.683$, $p < .001$]; *positive schizotypy* (step 1) [$R^2\Delta = .024$, $F(3, 352) = 2.905$, $p = .035$]; (step 2) [$R^2\Delta = .104$, $F(1, 351) = 41.892$, $p < .001$]; *disorganized schizotypy* (step 1) [$R^2\Delta = .007$, $F(3, 552) = .825$, NS]; (step 2) [$R^2\Delta = .125$, $F(1, 351) = 50.462$, $p < .001$].

DISCUSSION

The present data provides support for a relationship between schizotypy and defeatist beliefs in High School

adolescents (ages 14-17) and emerging adults college students (ages 18-22), helping to bridge a previously existing gap in the literature. This age span is considered the peak period of onset for schizophrenia (American Psychological Association, 2022) and represents a period of increased individuation and self-definition. The presence of self-doubt for new or challenging tasks can be considered normative, but the presence of strong defeatist beliefs across different domains of performance may indicate a distorted self-view that may serve as a risk factor for the development of psychopathology. In those with an underlying vulnerability to schizophrenia-spectrum disorders, these beliefs may act as an additional stressor and potential etiological variable within diathesis-stress conceptualizations of disorder (Fowles, 1992; Perivoliotis, Morrison, Grant, French, & Beck, 2009). In this way, these distorted beliefs, when combined with the exposure to negative life experiences, may be associated with a higher likelihood of emergent psychosis in at-risk individuals. Defeatist beliefs were most strongly linked to negative schizotypy symptoms, consistent with previous subclinical research with young adults (Luther et al., 2018). Negative schizotypy items often capture interpersonal discomfort and lower emotional expressiveness (Cohen et al., 2010) which likely have a reciprocal relationship with defeatist beliefs, both contributing to avoidant patterns. While this study did not include individuals with ultra-high risk (i.e., existing attenuated psychotic symptoms), it is conceivable that increasingly negative beliefs could play a role in the

variability of conversation to psychosis (roughly 8-28%; Hartmann et al., 2016; Nelson et al., 2016). This interpretation is consistent with developmental models of risk that emphasize the interaction between pre-existing vulnerabilities, periods of biological and socio-emotional development, and life experiences, in the emergence of disorder (Debbané & Barrantes-Vidal, 2015). In this instance, individuals with the endophenotypic indicators of risk (schizotypy) who engage in greater self-defeatist beliefs in adolescence and early adulthood (possibly related to existing cognitive difficulties; Luther et al., 2016 & 2018) may avoid pursuits that they perceive as challenging based on their self-doubts. This pattern might lead to patterns of behavior that ultimately limit the development of valued skills and social relationships that help buffer stress and aid in a positive identity formation and sense of purpose, “contributing to the slow unfolding of pathological manifestations at the phenotypic level” similar to what occurs in borderline personality disorder (Debbané & Barrantes-Vidal, 2015).

While this study did not provide evidence for a causal link between defeatist beliefs and schizotypy, additional research to elucidate the nature of this relationship is warranted. For instance, our findings are consistent with research linking defeatist beliefs to altered effort-based decision-making and willingness to expend cognitive effort in schizophrenia (Reddy, Horan, Barch, Buchanan, Gold, Marder, Wynn, Young, & Green, 2018), with this phenomenon having been evidenced across phases of psychosis disease progression from first episode psychosis (Fortgang, Srihari, & Cannon, 2020) to chronic schizophrenia (Culbreth, Moran, & Barch, 2018). Future work is needed to examine whether a mediating pathway may exist, where defeatist belief structures reduce effort expenditure that in turn impairs functional outcomes. In adolescents and emerging adults, these beliefs may impact the development of meaningful social relationships and the ability to benefit from learning opportunities which are crucial for emerging concepts of self (identity development) and interpersonal stability (Lawford, Astrologo, Ramey, & Linden-Anderson, 2020; Pop, Negru-Subtirica, Crocetti, Opre, & Meeus, 2016). Should a mediating or other causal pathway such as this be consistently evidenced across diagnostic categories and phases of disease progression, defeatist beliefs patterns could serve as a useful area of early intervention in adolescents and emerging adults. CBT skills have been shown to address defeatist beliefs and improve social and academic/professional functioning in individuals at risk for schizophrenia (Gupta, Antezana, Porter, Mayanil, Bylsma, Maslar, & Horton, 2023) and could be utilized as a preventative tool for early intervention in this population. For example, perhaps by identifying and modifying defeatist beliefs (among other distorted beliefs/perceptions) in those with high levels of schizotypy professionals may be able to disrupt the sequence of behaviors/events that ultimately contribute to the development of disorder for a proportion of those at-risk for psychosis. This is speculative and would require evidence from controlled research trials. However, there is already great potential in these age groups for implementation of CBT as individuals of school-age have ample opportunities for in-vivo exposure to potential stressors, especially those related to academic, professional, and social performance. Additional research is also needed to elucidate how academic performance and social functioning are impacted by defeatist beliefs, given the similar importance of these domains in both high school and college environments. An important limitation

of this study was the relatively small sample sizes collected from the Northeastern region of the US, limiting generalizability. Thus, we can only conclude that we found evidence for continuity of schizotypy and defeatist beliefs in our sample, but this requires confirmation in independent community samples, ideally from diverse regions and with diverse participant groups, to better determine if this is universal. Additionally, data was cross-sectional and self-report, thus we were not able to track the relationship of defeatist beliefs and schizotypy (or conversions to psychosis) overtime. Thus, the predictive value of defeatist beliefs in the ultimate development of schizophrenia in those at-risk remains to be determined. Future research into this domain should include longitudinal evaluation of defeatist beliefs (ideally beginning in adolescence) through young adulthood to better understand its behavioral/developmental impacts. Specific attention should be provided to the possible connection with negative schizotypy and the avoidant coping mechanisms that may stem from defeatist attitudes.

CONCLUSION

Our findings in healthy adolescents and emerging adults support past work examining individuals who are at ultra-high risk for schizophrenia or who have recently had their first episode. The link between defeatist beliefs and schizotypy, particularly for negative symptoms, is supported by our data. The current study extends this association further backwards into adolescence from previous research findings involving only young adults. Further, these findings indicate that the negative impacts associated with defeatist beliefs may exert their influence earlier than previously considered. Longitudinal research is needed to evaluate how these beliefs first form (e.g., existing cognitive processing deficits), and the magnitude of their impact during this formative period factors such as avoidant behaviors, self-identity, social relationships, academic functioning, and the development schizophrenia spectrum disorders. This form of research might help inform possible preventative strategies/policies (e.g. screening/interventions in those at-risk, perhaps extending back to adolescence) that would disrupt the development of disorder in a meaningful proportion of individuals.

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Declarations:

- i) IRB approval for this study was obtained prior to data collection. Participants provided consent or assent prior to participation.
- ii) All authors provide consent for the publication of this work.
- iii) Data is available upon request.
- iv) No authors have competing interests.
- v) This study was not funded.
- vi) The author DM wrote the first draft of this paper and helped coordinate with site affiliates. Authors SE and GM assisted with the High School data collection and provided input into the initial methodology and IRB approval of the study. Authors GN and TD supervised the collection of data (High School & University, respectively) and provided oversight on all data analysis and written products.

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