The Dissertation Committee for Fortunato N. Medrano Certifies that this is the approved version of the following Dissertation.

Status, Respect, and Adolescents' Responsiveness to Educational Interventions

Committee:

David S. Yeager, Supervisor

Jessica A. Church-Lang

Christopher J. Bryan

Robert Crosnoe

K. Paige Harden

Status, Respect, and Adolescents' Responsiveness to Educational Interventions

by

Fortunato N. Medrano

Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

December 2023

Acknowledgements

I have immense gratitude to my advisor David Yeager for your unwavering encouragement, endless enthusiasm, and relentless optimism. David's commitment to rigorous science aimed at promoting positive change in the world is a constant inspiration.

I would also like to thank the members of the Texas Behavioral Science and Policy Institute and the Adolescent Development Research Group for years of intellectual growth and support. Melanie Gonzalez, Julia Chafkin, Hae Yeon Lee, Joseph O'Brien, Ryan Bell, Michael Mullarkey, Mallory Dubias, Jess Hennessey, Cameron Hecht, Eric Smith, Kyle Dobson, and Mac Clapper, thank you for being the most supportive colleagues I could ever ask for. I would also like to thank Mesmin Destin and David Uttal for starting my journey in research and encouraging my growth as an early scientist.

I would like to thank my committee members Paige Harden, Jess Church-Lang, Rob Crosnoe, and Chris Bryan for your insightful comments, stimulating discussion, and practical advice as I worked to complete this project.

Finally, I would like to acknowledge my family: my siblings Christyna, Monyca, Nathan, Noah, and of course, my mother Angela. There are not enough words to thank you for the endless support, love, and understanding you have shown me over this long journey.

Abstract

Status, Respect, and Adolescents' Responsiveness to Educational Interventions

Fortunato N. Medrano, Ph.D.

The University of Texas at Austin, 2023

Supervisor: David S. Yeager

As adolescents progress through school, they exhibit declining interest and motivation, which can have lifelong negative consequences. The adolescent status-respect sensitivity hypothesis posits that adolescents do not only consider how beneficial education is to their long-term success, but they also pay disproportionate attention to whether their environment is affording them respect before deciding whether they will align their behavior with their long-term educational interests. Here, respect is defined as a gestalt judgment of whether one's rights, beliefs, and abilities are being afforded. In this dissertation, we test for the first time, a key prediction of the status-respect sensitivity hypothesis: adolescents' feelings of being respected in their environment should moderate the extent to which they profit from an attempt to influence their academic motivation and achievement (Study 1). We do this by examining the moderating effect of feeling respected on a growth mindset of intelligence intervention delivered in a nationally representative sample. Then we show this effect operates on an individual level, that is, how different students in the same class report different levels of respect from the same teacher and these within classroom differences explain variation in intervention effects. Next, we address the most significant barrier standing in the way of teachers being able to act on these findings:

a lack of clarity about which teacher practices communicate respect to adolescents most effectively (Study 2). Using an inductive qualitative process, involving adolescents' own descriptions of teacher's respectful practices, we show that there is very little consensus about specific behaviors that were respectful or disrespectful. However, there were higher-order organizations of practices that led to a simple and practical framework of respect. Respect emerged from the combination of high standards conveying that a student could be competent and valuable and therefore has worth to the group (i.e., academic press), and providing the necessary support to help the student meet these high expectations. These inductive conclusions were confirmed using applications of natural language processing and machine learning with the language data. While promising, Study 2's results were based on a small number of adolescents. To assess whether the framework generalized, we applied it to student reports of teacher behavior in a nationally representative dataset (Study 3). Using a machine learning analytical technique, we found comparable results, whereby students reported feeling more respected by teachers if those teachers had high academic press and offered supports to meet high standards. Overall, these studies highlight respect as a potential mechanism through which adults' behaviors influence adolescent behavior. This is important because it suggests that during this developmental stage of adolescence, individual experiences of respect from the environment could be having powerful effects on adolescent trajectories. Furthermore, by providing educators with a "recipe" for respectful interactions in the classroom, this dissertation simplifies for teachers the challenge of motivating and engaging their students. This theory could be extended beyond academic motivation to other key areas of adolescent behavior, e.g., drug use, school discipline, reckless driving, healthy eating, and more.

Table of Contents

List of Tables

List of Figures

Chapter 1: Adolescents' Need to Feel Respected

Adolescents' motivation in school matters profoundly for their lifespan development, because actions taken during this critical transitional period have compounding effects later in life. For instance, taking additional math courses during high school leads to greater success in college and lifetime earnings (Byun et al., 2015). Unfortunately, adolescence is also a time when motivation and interest in school decrease dramatically (Ainley, 2006; Bailey et al., 2017; Corpus et al., 2009; Gottfried et al., 2001). These facts have spurred policymakers and practitioners to focus on methods that increase motivation to promote achievement during this time.

One promising way to improve adolescent motivation is a "wise" intervention, or an intervention that focuses on the meaning-making process in which people engage (Walton, 2014; Walton & Wilson, 2018). Grounded in a social-cognitive perspective, wise interventions shift the beliefs, construals, and/or mindsets people hold to bring about motivation and behavior change. Several wise interventions have successfully improved motivation and achievement (Eskreis-Winkler et al., 2016; Yeager, 2019; Yeager, Henderson, et al., 2014; Yeager, Purdie-Vaughns, et al., 2014). For example, research has found that instilling a growth mindset in students (the belief that intelligence is malleable through effort and strategy) can lift achievement (Yeager et al., 2019).

One important advance in research on wise interventions, growing out of ecological systems theories of development (Bronfenbrenner, 1977), has been a focus on the contextual factors that allow wise interventions to have lasting effects. This is in line with recent calls to focus on exploring treatment heterogeneity rather than average treatment effects (Bolger et al., 2019; C. J. Bryan et al., 2021; Tipton et al., 2019). In general, research has found recently that interventions will be more successful if they are delivered in

environments that support them, i.e. a "seed in fertile soil" (Walton & Yeager, 2020). Contextual factors are therefore important to understand if researchers are to effectively understand how to promote academic achievement. To date, however, these contextual moderators of adolescent interventions are rarely investigated.

The present dissertation examines a crucial aspect of adolescents' context: how respected they feel. As explained below, obtaining and maintaining social status and positive regard (i.e. respect) from others is a key task during adolescence, one that adolescents are uniquely geared toward accomplishing. Adolescence starts with pubertal maturation which leads to a host of biological, cognitive, and social shifts that each contribute to an acute sensitivity to and ability to garner social status from others. As a result, respect becomes an important influence on how much motivation and attention adolescents direct towards certain tasks or behaviors. Signs of disrespect in a particular environment will likely lead adolescents to avoid or abandon certain activities.

To illustrate the importance of status and respect in motivation for adolescents, consider the example of a student getting harsh, unfair comments on a test, or being called out in front of the entire class. This could lead an adolescent to conclude they are unable to succeed in school, and be perceived as competent in the eyes of others (Cohen et al., 1999). They may subsequently put forth less effort or entirely abandon schoolwork. On the other hand, signs of respect towards a student in a particular environment will likely encourage an adolescent to pursue certain activities. As a result, whether adolescents are afforded respect in an environment directly impacts how much effort, attention, and motivation adolescents will put towards a task. This line of reasoning leads to a key hypothesis at the heart of this dissertation: how respected adolescents feel should moderate the effectiveness of an adolescent intervention on academic outcomes.

Specifically, in this dissertation I propose the *Status and Respect Hypothesis*, which holds that adolescents possess an outsized desire to feel respected and that this desire guides their motivational priorities and subsequent sensitivity to behavior change efforts. Although the foundations of this hypothesis have appeared in the literature (Yeager et al., 2018), no study has directly tested whether attempts to shift adolescent behavior depend on how respected they feel.

Beyond this basic hypothesis test is a pivotal question: what counts as respect in the eyes of adolescents? Answering this can help the field move toward practical advice on how promote more respectful environments for youth, which could inform future researchers, practitioners, and policy makers. Established frameworks in the literature, such as those related to social status, institutional trust, and interpersonal relationships, are starting points for identifying what feels respectful to youth (discussed in depth below). To date, however, there has not been a comprehensive investigation into what adolescents find respectful.

This dissertation attempts to answer these questions in three studies. Study 1 examines the importance of adolescents feeling respected by looking at how perceptions of classroom respect moderate the impacts of an otherwise-effective wise intervention (growth mindset). Study 2 analyzes adolescents' own views of what being respected means, using both qualitative content analysis and quantitative machine learning text analysis, yielding a framework for feeling respected in the classroom. Study 3 then takes this framework and maps it to student reports of teacher behaviors in a large representative sample to predict students' feelings of respect.

This dissertation makes three key contributions to the literature on adolescent development. First, it directly tests the link between adolescents' feelings of respect and school achievement and motivation, in a large, randomized trial. Second, this dissertation

utilizes both qualitative and quantitative methods to explore what adolescents find respectful about their interactions with teachers. Up until now, reviews and commentaries have only inferred what is respectful to adolescents, often *post-hoc*. Finally, this work begins the work of providing teachers and other practitioners with guidance on how to craft more respectful environments for their students.

ADOLESCENT SENSITIVITY FOR STATUS AND RESPECT

What do we mean by respect? We do not mean admiration, as when an observer says, "I respect his accomplishments." Nor do we mean compliance due to fear, as when a prison guard says, "respect my authority." Instead, in this dissertation respect is defined as *a gestalt social judgment based on the personal regard one feels when one's rights, thoughts, feelings, and wishes are being granted, given one's role in society* (see Miller, 2001; Ruck et al., 1998). In short, we feel respected when our humanity is taken seriously.

Psychological, sociological, and anthropological theories suggest that feeling respected is critically important for the transition from childhood into a role that contributes to adult society (for review, see Yeager et al., 2018; Blau, 1986; von Rueden, 2014; Dornbusch, 1989; Fuligni, 2019). Further, respect is elicited differently in different contexts; the specific needs, wishes, and rights that should be respected, and how to do so, vary depending on the situation and cultural milieu (Anderson et al., 2015; Huo et al., 2010; Leary et al., 2014; Torelli et al., 2014). In general, however, one feels respected when they are treated as competent, autonomous, and capable of contributing to the group because such treatment suggests that one has social value, contribution, and prestige in the group (Anderson et al., 2015; De Cremer & Tyler, 2007; Simon & Stürmer, 2003; Tyler & Blader, 2003; Ryan & Deci, 2018). Adolescents in particular may be more sensitive to signs that they are being respected (and disrespected) because of the biological changes involved in

16

pubertal maturation (e.g. increases in hormones such as testosterone during gonadarche), their increasingly more complex social contexts (e.g. navigating larger schools and a dynamic online world), greater social-cognitive skills that heighten attention to others' evaluations of them (e.g. mentalizing), and an overall increase in the importance of the peer group on behavior (Blakemore & Mills, 2014; Crosnoe, 2011; Dahl et al., 2018; Harden et al., 2017; Yeager et al., 2018). Adolescents are therefore likely to align their attention, motivation, and behavior to attain the rewarding feeling of being respected and avoid the pain of disrespect (see Yeager et al., 2018). These findings suggest that behavior change approaches are more likely to capture adolescents' attention and improve motivation to change when they offer the prospect of feeling respected and do not threaten to disrespect them.

Thus, the status and respect sensitivity hypothesis involves three propositions:

1. Pubertal maturation spurs an increased sensitivity to status and respect that influences motivation and behavior change during adolescence.

2. Adolescents seek out signals of whether they are seen as competent, capable, and well-liked in order to determine if they are respected.

3. Messages and environments that honor the need to be respected lead to greater motivation and subsequent behavior change.

We predict that feelings of respect will be linked to stronger motivation and subsequent achievement in school. Moreover, interventions and practices that capitalize on fulfilling this need for adolescents will be more effective at changing adolescent behavior. Below, we present a short review of relevant literature that supports each of these claims and point out the current gaps in the literature that this dissertation directly addresses.

The start of adolescence is precipitated by the pubertal maturations that bring about a cascade of physiological and cognitive shifts. A well-researched aspect of these pubertal

changes is that they spur a period of greater social and affective reasoning that directs goals and motivation (Crone & Dahl, 2012). Middle adolescence in particular is a time of greater reactivity to signals of rejection and social evaluation compared to earlier and later stages of development. For instance, middle adolescents (age 15) showed greater stress responses (measured via salivary cortisol) during the Trier Social Stress Test, or TSST, compared to younger adolescents (ages 9 - 13) (Gunnar et al., 2009). (The TSST involves participants performing tasks (mental math, public speaking) while receiving negative social feedback from confederates.) Another study expanded this finding by looking at both the TSST and Yale Interpersonal Stressor, or YIPS, and other biological measures of stress (blood pressure, heart rate, and salivary alpha amylase) in addition to salivary cortisol. YIPS is a peer rejection scenario in which a participant is continually excluded and rejected from a conversation with two other confederates. The study found that adolescents (age 13 - 17) had higher stress reactivity across measures compared to children (age 9 - 12) across both tasks and all stress measures (Stroud et al., 2009).

Adolescents' greater sensitivity to status can be broken down into two components: 1) the desire to acquire and maintain status and 2) the skills necessary to discern one's status from the environment (as well as predict the impact of potential behavior). By middle to late adolescence, both components are in place, which results in adolescents being aware of the status and respect they garner from others and willing and able to change their behavior and goals to be in line with whatever affords status and respect in an environment.

Desire to Acquire and Maintain Social Status

Several lines of converging evidence suggest that adolescence is a period of a greater desire to acquire and maintain social status. First, the feelings of adoration and pride that are a result of being granted status and respect are highly rewarding and, as a result,

highly motivating. Indeed, another way to conceptualize a sensitivity to status and respect, is an increase to the rewards status and respect elicit (see Foulkes & Blakemore, 2016). This increase in reward is what some have theorized as an explanation for increases in adolescent risk-taking behaviors and the development of mental health issues (Galván, 2013; Silk et al., 2012). While animal studies confirming this sensitivity to social reward are relatively common and in agreement in animal research (Robinson et al., 2011; Yates et al., 2013), studies involving human adolescents are less prominent. In one study, however, researchers simulated a popular social media website where individuals could share and like photos while examining adolescent participants in an fMRI. They found that when viewing pictures with a greater number of likes, adolescents showed greater activation in neural regions associated with reward processing and social cognition. Follow-up analyses implicated the nucleus accumbens, a key center in the brain's reward processing, in the experience of receiving positive social feedback (Sherman et al., 2016). Together, these findings suggest that adolescence is a time when social stimuli can be particularly rewarding.

A second line of research has examined the role that pubertal hormones play in social reactivity and motivation; i.e. the hormones that surge at the start of and through puberty (for reviews, see Blakemore et al., 2010; Peper & Dahl, 2013; Sisk & Zehr, 2005). One of these key hormones is testosterone, which increases in both boys and girls throughout gonadarche (Braams et al., 2015). Recent research has demonstrated its role in influencing adolescents' desire to learn about and attain status and respect (De Lorme & Sisk, 2013; Josephs et al., 2006; see Terburg & van Honk, 2013). For instance, one study found that testosterone levels in adolescents predicted greater activity in response to social emotional stimuli compared to basic emotional stimuli (Goddings et al., 2012). Other

studies have looked at how testosterone administration leads to increased reward processing, vigilance, and motivation to act in social environments (Bos et al., 2012).

The exact motivational and behavioral effects of testosterone depend on what improves social status in a particular context, and therefore can manifest as pro- or antisocial, adaptive or maladaptive, and aggressive or passive behavior. While much of the research around testosterone and social decision-making has been in animals, there is a growing body of human based research demonstrating this effect (for overview, see Eisenegger et al., 2011). One study found that in adolescent boys, higher testosterone levels were associated with greater aggression among those with deviant friends but leadership among those without deviant friends (Rowe et al., 2004). Another study demonstrated that administered testosterone can lead to either prosocial or antisocial behavior depending on which behavior was associated with gaining status (Dreher et al., 2016). While historical work often associated only testosterone with male aggression, more recent work now understands testosterone as having a complex role alongside other hormones in relation to social behavior.

Taken together, this evidence suggests that adolescents in particular have a sensitivity to status and its associated reward, along with a motivation to attain and maintain their status.

Ability to Discern One's Status

Along with the physiological shifts that occur during adolescence, certain cognitive abilities related to navigating social environments of increased complexity continue developing. As a result, adolescents are increasingly able to discern the signals indicating their own status, process social emotional information, and predict the impact of their behavior on their status (for a review, see Blakemore & Mills, 2014). This increase in

ability to contend with status allows adolescents to act on their increased desire to attain and maintain status. These abilities can collectively be thought of as "social cognition" or social cognitive abilities, which include facial processing, social emotions, and the ability to mentalize (i.e., theory of mind; the ability to discern the mental statues of others). While there are many studies that examine how a theory of mind develops among young children, until recently, few studies have focused on how it continues to develop into adolescence (Hughes & Devine, 2015; e.g. Meinhardt-Injac et al., 2020). Meinhardt-Injac et al. found that both social-perceptual ability (inferring mental states from nonverbal cues) and social-cognitive ability (verbal reasoning of mental states) linearly increased with age from young adolescence (age 12) to young adulthood (age 22). Moreover, the relationship between age and social-percentual ability could not be accounted for increases in other cognitive abilities (language, reasoning, and inhibitory control), indicating that perceiving others' mental states develops independently of other improvements in general cognitive ability.

Mentalizing, appears to have its neural correlates in the "social brain network:" the dorsal medial prefrontal cortex (pmPFC), temporoparietal junction (TPJ), posterior superior temporal sulcus (pSTS), and anterior temporal cortex (ATC) (Adolphs, 2009; Frith, 2007). Gray matter volume and cortical thickness in the pmPFC, TPJ, and pSTS decreased and increased in the ATC throughout childhood through adulthood, while surface area peaked for each area during adolescence (Mills et al., 2014). Functionally, a study found that adolescents but not adults recruited the dmPFC during a social task even when social cues were not needed (Dumontheil et al., 2012). Another study shows that adolescents had greater activity in the dmPFC than adults when reading social emotional sentences relative to basic emotional sentences (Burnett et al., 2009). These structural and functional shifts indicate that this brain network has a protracted developmental trajectory and that the ability to infer the mental states of others is still developing during adolescence.

These basic neural and hormonal changes in adolescents set the stage for a "social awakening" throughout adolescence. Although much of the research in the literature has focused on how these developments contribute to sex, sexuality, and reproductive maturity, in this dissertation I emphasize that there are other types of social rewards that adolescents prioritize. Examples include being a good friend, impressing your community with your accomplishments, or simply feeling good about yourself and your social standing. Collectively, these are experiences that signal the *respect* one has in one's reference group. A key assumption in this dissertation is that the basic biological maturations of adolescence are not solely implicated in sex and aggression but are also a reason why the pursuit of feelings of respect have an outsized influence on adolescents' behavior changes.

HOW IS RESPECT DEFINED AND STUDIED?

As noted above, the concept of respect is in a nomological network of concepts that have both scientific and lay definitions, such as status (Anderson et al., 2015), face (Eriksson et al., 2017; Goffman & Best, 2017; Merkin, 2018), trust (Bryk & Schneider, 2002; Cohen & Steele, 2002; Dunning et al., 2014), social worth (Rothers & Cohrs, 2022), prestige (Maner & Case, 2016), fairness (Tyler, 2010), politeness (Naiditch, 2018; Teitelbaum & Ben-Ze'ev, 2023), acceptance (Hirsch & Clark, 2019) and affirmation (Spencer et al., 2001) to name a few. Past work has defined respect as providing status and inclusion (Huo et al., 2010), as a way to show deference and provide status (Anderson et al., 2015), as showing fairness and care (Tyler & Blader, 2003), as engaging in polite speech and behaviors (Naiditch, 2018; Voigt et al., 2017), as being fully accepting of another (Simon & Grabow, 2014), and as acknowledging the social worth one has (Rothers & Cohrs, 2022). For the purposes of this dissertation, I consider respect to be a socially-constructed experience—one that that does not exist outside of a social group—and that

22

emerges from actions or qualities that are worthy of status in a reference group. I say reference group because adolescents inhabit many different worlds and have overlapping and non-overlapping roles (e.g. as a student, a friend, a relationship partner, a teammate, and more), and each of these roles can have different criteria for status and earning respect (Crosnoe, 2011; Goffman & Best, 2017).

Despite the various conceptualizations of respect, there are two general threads that emerge throughout the literature: respect as status and respect through trust. First, status and respect are inextricably linked with one another, often being used interchangeably. In fact, respect researchers will define being respected as having status and being included by others (Huo et al., 2010) while status researchers will define having status as being respected and admired (Anderson et al., 2015). Therefore, one should be respected when they have status, and one garners status by having instrumental value (i.e. competencies and skills) and being willing to use those skills for the benefit of others (Anderson et al., 2015; Blau, 1986). High status individuals are therefore seen as being competent, skillful, capable of contributing to the group, and as having agency; as a result, one should feel respected when these traits are acknowledged. This is conceptually similar to the idea of fulfilling self-determination needs (Ryan & Deci, 2000), the basic human needs to feel included in the group and capable of contributing.

Second, respect often coincides with the presence of trust. Trust is created when one feels another person, group, or institution is treating them with dignity, fairness, and equality, especially in the context of authority interactions (Tyler, 1990; Tyler & Lind, 1992). Therefore, trusting in another equates to a belief that they will be fair, supportive, and have respect for one's rights as a person. This is especially relevant in contexts where one is subject to the authority of another, such as students interacting with their teacher. Violations of fairness and trust are often the surest way to elicit feelings of disrespect, i.e.,

23

when people are treated as someone who is not worthy of basic human rights that are appropriate to one's developmental stage. This fact is particularly relevant to adolescents who are more likely to experience a mismatch between what they believe is appropriate for their abilities and age and the beliefs of adults around them.

These links between the concepts of respect, trust, status, and more have led to some challenges with measurement of status and respect sensitivity in the literature. The first challenge concerns whether feelings of respect are an individual judgment or collective judgment of a context. Concepts like trust appear to be more individually oriented, while respectful treatment appears to be more about the context. This raises a question: is it more consequential if an individual member of a group feels disrespected vs. respected (regardless of how the rest of the group feels), or is it more important for the group to collectively discern that a given leader is disrespectful? In this dissertation, my starting assumption is that feelings of respect are an individual judgment, in part because one's personal background or experiences can shape one's gestalt perception of an interaction or relationship, and lead to different treatment from authorities. For example, research by McFarland showed that different adolescents in the same classroom tend to receive very different disciplinary actions from teachers (McFarland, 2001). Nevertheless, I will empirically test the differential moderating impact of individual judgments of respect versus collective judgments of a group (e.g., a classroom).

Another measurement challenge comes from the survey items used to measure feelings of respect. The literature includes many different measures. Some items ask individuals how respected they feel, others ask about their perceptions of others (e.g., "others look up to me"), still others examine the known contributors to respect such as procedural justice (e.g., "I am treated fairly") or belonging (e.g., "others feel warmly towards me"). In the present dissertation studies, I used measures that simply ask about

respect, allowing participants to define it how they wish. I include measures that are highly associated with respect when conducting secondary analyses of datasets I did not design, but ensure there is strong construct fit when doing so.

WHAT COMMUNICATES RESPECT?

As with the definition of respect, there are many ways in which respect could be communicated to adolescents. By taking our definition of respect as the personal regard and dignity one gets from having their thoughts, feelings, and rights recognized and acknowledged, we can start to identify potential frameworks that may help to understand what contributes to a feeling of respect. Below I identify at least three frameworks that could help articulate what instills feelings of respect, and therefore can offer insight into the kinds of teacher or parent practices that likely lead to respect (vs. disrespect) in field settings.

Self-Determination Theory and Respect

One possible way to convey respect to an adolescent is to support their psychological needs. Self-determination theory (SDT) posits that humans have three basic psychological needs -- autonomy, competence, and relatedness – that produce ongoing motivation and well-being when satisfied (Ryan & Deci, 2018). *Autonomy* is the feeling that one has choice and control over their behavior, *competence* is the feeling of having mastery or being skillful, and *relatedness* is the need to be connected and have a sense of belonging with those around you. Structures and environments that support the three needs of autonomy, competence, and relatedness facilitate more positive outcomes, such as sustained motivation. This theory distinguishes motivation along a spectrum that varies in the level of control vs. autonomy one has, ranging from amotivation (low/no motivation)

to extrinsic motivation (outside influences), to intrinsic motivation (internal, self-directed interests). In sum, people feel more motivated, fulfilled, and confident when they are acting in autonomous ways and for self-directed reasons.

Although many studies have demonstrated the link between satisfying the three SDT needs and motivation, I propose that a missing perspective is the role of respect in this process. Specifically, supporting a person's basic psychological needs (autonomy, competence, and relatedness) is one way to support the human dignity of another person. In other words, creating a sense of autonomy, competence, and relatedness should lead to feelings of respect, because they signal valuing the abilities of a person and their acceptance into the community, which are key concerns for many adolescents. For example, a teacher that offers a student's choice in how they complete their project, acknowledges their skills and abilities, and makes them feel welcome as part of the community will have created a respectful environment for their students. Following this logic, I propose that supporting SDT needs should lead to greater experiences of respect, while thwarting those needs should lead to experiences of disrespect. Thus, although studies have tested the link between SDT need fulfillment and motivation/performance, we are not aware of any that have tested whether this greater motivation comes about, in part, because supporting SDT needs is respectful.

Procedural Justice

Another possible way to respect adolescents is for powerful authority figures in a setting to use fair procedures. Said differently, one way to make adolescents feel disrespected is to be unfair and unjust. What are examples of just and fair procedures?

Procedural Justice is a theory born out of sociological and political science research on institutional authority and legitimacy (Nagin & Telep, 2017; Tyler, 2010). Proposed by

Tom Tyler (1990), the theory stipulates that individuals evaluate an institution or authority based on whether they are fair in their decision making and just in their treatment of individuals. Mazerolle et al. (2014) defined aspects of procedural justice having four key components: dignity and respect, trustworthy motives, neutrality, and voice. Procedural justice has primarily been applied to understanding how governmental authorities, such as police, courts, and legislation, can promote perceptions of legitimacy and ultimately lead to greater compliance with policies.

Applying this to adolescent behavior, we can think of many adult-youth interactions as being rooted in the adult's attempt to gain compliance (e.g., manage a student's behavior); therefore, the procedural justice with which the behavior-change request was delivered could influence the adolescent's readiness to comply. In the context of schools, procedural justice refers to whether students believe their treatment by authority figures (e.g., teachers) is fair, especially as it relates to punishment. Prior work has demonstrated that students who perceive a greater sense of fairness and justice show positive academic progress, less delinquent behavior, and greater bonds faculty and staff (Bracy, 2010, 2011; Downey et al., 2009; Gottfredson et al., 2005; Gottfredson & Gottfredson, 2012; Kupchik, 2016; Preiss et al., 2016; for review, see Granot & Tyler, 2019). For example, students rated a teacher who applied rules impartially and allowed students to explain themselves as more legitimate and said they were less likely to break those rules in the future (Trinkner & Cohn, 2014).

How teachers can create *procedurally just* environments is less understood. Research so far has rarely tested the tenets of procedural justice theory in the classroom or with adolescents. Moreover, much of the work so far has been focused on looking at compliance with an authority rather than an internalized and sustained motivation to do what is in one's long-term self-interest (e.g., completing difficult homework).

Nevertheless, procedural justice theory is a promising lens through which to view respect, because it offers a framework to examine the process playing out between students and teachers. These theories point to trust and fairness being key factors to the student-teacher relationship, which other developmental theories corroborate. Indeed, adolescents are increasingly aware of and expectations for being treated fairly (Ruck et al., 1998), and are capable of using personal experiences to assess the fairness of social institutions such as schools (Brown & Bigler, 2005). We theorize that the basic tenants of procedural justice theory will be linked to adolescents' experiences of respect.

Warm-Demanders and Wise Feedback

A third framework—the *warm demander* framework—has the potential to simplify and integrate the insights from SDT and procedural justice theory, which could make analyses and results more interpretable to both researchers and practitioners alike.

Warm demanders are defined in the literature as teachers who hold high standards while having high personal regard for their students (Vasquez, 1988). That is, in the warm demander framework there are two dimensions: the rigor of one's standards (demandingness) and the support provided for meeting those standards (warmth). Born out of ethnographic accounts of highly successful teachers of minority and disadvantaged students and aligned with classic frameworks of authoritative parenting (Baumrind, 2013), the warm demander description is used to describe teachers who are culturally responsive to diverse students by simultaneously acting as a disciplinarian, a caregiver, and a pedagogue (Ware, 2006). This teaching style is recognized as being particularly good at motivating and encouraging success for low-achieving, disadvantaged students because teachers can hold students to a high expectation of learning while providing warmth.

While being a tough authority figure may initially seem disrespectful, students report the opposite. One student said, "she doesn't disrespect us in any way. It's not like, 'I'm the teacher and I'm the authority and I am gonna use it however I want to'" (Gregory & Weinstein, 2008). By showing they have their students' best interests at heart along with high standards of success, these teachers instill a sense of trust with their students. Empirically, the combination of high standards and personal regard predicted higher achievement among negatively stereotyped and disadvantaged students (Gregory & Weinstein, 2004; Yeager et al., 2017; Yeager, Purdie-Vaughns, et al., 2014). In a large survey study of high school students, academic press (high standards) and a strong sense of community (personal regard between teachers and students) predicted higher achievement among low- and middle-SES schools (Shouse, 1996).

Cohen, Steele, and Ross (1999) experimentally demonstrated that when African American students were told they received critical feedback because of their instructor's high standards and belief in their ability to reach those standards (personal regard), those students showed more academic motivation. Moreover, students were less likely to attribute their instructor's comments to bias against them and instead as a signal of believing in their success (Cohen et al., 1999). Described as "wise feedback", this method helps to combat the negative feelings that come when being critically evaluated. This type of feedback is especially relevant when students have reason to believe their instructor is being biased or unfair towards them, e.g., a woman pursuing a STEM degree, a student of color in a majority white classroom, a previously delinquent student, etc. Wise feedback buffers against the sting of criticism by communicating to students that they will not be judged or held back by stereotypes and instead will be treated with respect as a worthwhile individual. While respect has not been explicitly measured as a result of wise feedback, a daily diary study found that when students experienced high standards and personal regard

29

from teachers, they were more likely to trust those teachers (Gregory & Weinstein, 2008). Moreover, a wise feedback intervention conducted with middle schoolers halted the decline of student's trust in their teacher observed in prior semesters (Yeager, Purdie-Vaughns, et al., 2014).

Warm Demander theory and Wise Feedback arose from the specific practices that good teachers implement and offer clear behaviors to focus on, an advantage over the previously discussed frameworks. They offer insight into how to mitigate the bias and barriers students of color and other disadvantaged groups face in the classroom. However, they have not been explicitly connected to developmental theories nor have they been expanded on much since their introduction. Perhaps these approaches are affected because they provide a critical need (to feel respected) to students who are less likely to experience it (e.g., marginalized students). Regardless, the combination of high standards and high support appears to be a powerful recipe for student success.

Summary of Frameworks.

Overall, each of these theories (SDT, Procedural Justice, and Warm Demander/Wise Feedback) offer insight into candidate teacher behaviors and candidate practices that will instill a sense of respect. However, each of these theories has fully linked positive teacher practices to respect through a developmental lens. SDT is a robust theory of human motivation with many links to school practices and human development (see Ryan & Deci, 2018); however, it does not offer concrete practices or guides for practitioners, nor does it integrate respect and status fully. Procedural justice theory offers many concrete practices for authority figures to implement to increase trust; however, this framework has little work focusing on schools or accounting for developmental context.

Warm Demander and Wise Feedback theories are grounded in the practices of teachers and experiences of students but have not yet been linked to SDT or procedural justice.

In my dissertation, I propose that SDT need-support, and actions that promote procedural justice, can be categorized along the two dimensions of the warm demander framework: standards (i.e., press or demandingness) and support (i.e., personal regard or fairness). According to my theorizing, adult actions that combine the two dimensions should be rated as the most respectful by adolescents, and those that lack both of the two dimensions should be rated as the least respectful. My dissertation will be the first to use qualitative and machine-learning methods to empirically test this possibility.

INTERVENING ON ACADEMIC MOTIVATION: THE CASE FOR WISE INTERVENTIONS

Increasing students' motivation with school is at the heart of many efforts to improve academic achievement; most teachers, administrators, policy makers and other stake holders chase after any method that will make students more interested, engaged, and driven to succeed in school. These student-oriented approaches to improving educational outcomes usually attempt to either address a deficit in the person, i.e. skills (e.g. self-control), competencies (e.g. remedial classes, extra tutoring), or habits (e.g. study sessions), or the situation, i.e. resources (e.g. tutoring), opportunities (e.g. free pre-school), or incentives (e.g. payments for complete homework). While these approaches are undoubtedly important, and several have been shown to be helpful (see), they often miss an important part of the process: individual's own construals and interpretations. How individuals create meaning from their experiences and the world around them can have profound impacts on their subsequent interactions with their environment (i.e. their behavior). "Wise" interventions seek to shift this subjective meaning-making (i.e.

mindsets, construals, beliefs, etc.) in order to create lasting impact on behavior in a variety of contexts (see Walton & Wilson, 2018).

Wise interventions were developed from a long tradition of social and developmental psychology; mainly Lewin's proposition (1947) that prior experiences shape the present psychological field individuals act in. In other words, the beliefs and mental representations people develop influence their current and future behavior. Moreover, this process is ongoing with feedback and information gleaned from the present environment shaping future representations. Such a process becomes recursive when feedback from the environment reinforces the held representations which in turn go on to influence future behaviors. These recursive processes can lead to large effects over time, an impact that can be seen in life-span models of human development (Elder Jr & Shanahan, 2007). Wise interventions seek to disrupt, or at least modify, these recursive processes by changing these internal representations (or "construals") in order to elicit subsequent behavior change.

A Focus on Heterogeneity: Person and Contextual Effects

More recent work on wise interventions have focused on examining heterogeneity of treatment effects. In other words, researchers have moved from asking "is there an effect" to asking "where and for whom is there an effect" (Bolger et al., 2019; Bryan et al., 2021). Carroll et al. (2023) recently proposed an ecologically informed model that emphasizes both social cognitions (i.e., mindsets) during critical turning points of developments and of the contexts that shape the effects of mindsets during long-term outcomes. As a result, any intervention effects that attempt to shift these processes will likely depend on both individual differences (e.g., mindsets/beliefs, identity groups) and contextual factors (e.g. teacher beliefs, supportive environments).

A relevant example of these individual differences relating to treatment effects can be seen in Yeager et al.'s wise intervention on student mistrust (2014). Many students, though especially minority students, wonder whether they can trust their teachers and institutions to have their best interests at heart. As minority students are more likely to be aware of racial bias in society at large, and to personally experience bias at school, they are more likely to develop chronic mistrust. This mistrust can lead students to interpret critical feedback, something necessary for academic improvement, as being a sign of the teacher's apathy, bias, or derision and therefore something that should be rejected. Yeager et al. intervened on this feedback by attaching notes to a teacher's critique of essays their students wrote that explained they were giving feedback because they had high standards for success and believed in students' abilities to reach those standards. The note led to an increase in the number of students that revised their essay, and the subsequent grade students received on the essay, with effects being stronger among minority students. Effects were particularly larger for minority students who mistrusted school more at baseline, with the treatment halting the decline in trust observed in the control group.

A relevant example of the contextual effects can be seen with Walton et al.'s belonging intervention among college students (2023). Many college students question whether they belong during their time at college, especially during their first year and disadvantaged (minority and first-generation) students. This belonging uncertainty has been shown to relate to first year completion rates and achievement, and prior interventions designed to assuage these worries are effective as closing achievement gaps (Walton & Cohen, 2011). These researchers demonstrated how contexts (i.e., campuses) that afforded opportunities for belonging (as measured by the control groups average end of year belonging ratings) showed greater treatment effects, especially among historically disadvantaged groups (Walton et al., 2023).

33

Both studies demonstrate something interesting about the direction of moderation, in that individual differences tend to show negative moderation. Meaning, more at risk students (e.g., low-belonging and low-trusting students) tend to show greater effects of the intervention (compared to high-belonging and high-trusting students). On the other hand, contextual effects tend to be in the positive direction; meaning, environments that have higher affordances and supports (e.g., greater belongingness) show greater treatment effects compared to lower-supportive groups. The theoretical interpretation of these findings is that educational interventions are providing a resource that is lacking among disadvantaged or struggling students ("water on parched soil"), but can only be effective long term when the environment supports the intervention ("seed in fertile soil") (Walton & Yeager, 2020).

As another example, the National Study of Learning Mindsets (NSLM; examined in Study 1) tested the effects a growth mindset of intelligence (teaching students that intelligence can change and grow). Researchers found the treatment effects were negatively moderated by student achievement level and baseline mindset (individual differences), with higher treatment effects among lower achieving and less growth mindset endorsing students (Yeager et al., 2019). Subsequent analyses also found treatment effects were positively moderated by teachers' mindset beliefs and schools' peer norms (contextual factors), with higher treatment effects among more supportive environments that afforded students opportunities to enact a growth mindset (Yeager et al., 2022).

As of yet, respect has not been explored as a potential source of heterogeneity of educational intervention effects. Yet, given the importance it plays in the guiding the behavior of adolescents, it is likely to influence how effective attempts to change that behavior are. However, there is still an open question of what exactly an effect of respect on the treatment effect of an intervention will look like. Will it be positive, i.e. stronger

among students who feel more respected like a contextual effect, or will it be negative, i.e. stronger among students who feel more disrespected like an individual difference. This is an interesting puzzle that this dissertation will (hopefully) begin to solve.

OVERVIEW OF THIS DISSERTATION

The present dissertation answers three main research questions in three studies. Collectively, they reveal the role of respect in adolescents' readiness to change their behavior, and they identify feature of the context (as well as concrete adult actions) that can provide guidance for researchers and practitioners who wish to create more respectful environments for youth.

RQ 1: Does the experience of respect moderate adolescents' responsiveness to a behavior-change intervention? This first question is a basic hypothesis test of a core tenet of the status and respect sensitivity hypothesis. I use an established "wise" intervention (i.e., a growth mindset intervention) and assess whether treatment impacts on long-run behavior change (i.e., grades) are weaker or stronger among 9th grade adolescents who felt respected versus disrespected. This first question is an important foundational test of the model proposed here and can justify further work on what counts for respect.

RQ 2: Which teacher practices best predict adolescent experiences of respect, and how can these practices best be summarized? The second question I answer uses qualitative methods, and insights from the three established theoretical models noted above, to identify the descriptions of respectful practices that best relate to adolescents' experiences of respect. Then I assess whether simplifying the practices along two dimensions can yield meaningful patterns in the data. This question is important to answer both because it could unite competing theoretical frameworks, and because it could provide a simplifying heuristic for educators and practitioners to use in applied settings.

35

RQ 3: Do respect-communicating practices relate to student outcomes in a large, nationally representative sample? The final question I answer takes the insights from RQ2 and applies them in a re-analysis of a large, nationally representative dataset of 9th grade students' math achievement. This confirmatory test of the model is important because it can provide more generalizable evidence that goes beyond the convenience sample used to answer RQ2. In addition, this study could identify simple measures that might be used in future studies to continue to interrogate the adolescent status and respect sensitivity hypothesis.

Throughout, I use multiple methods, including state-of-the-art machine learning and Bayesian analysis methods to test my hypotheses. This rigorous, multi-method approach is intended to yield converging evidence on a complex space from divergent sources.

Chapter 2. Growth Mindset Intervention Effects Moderated by Feelings of Respect (Study 1)

In Study 1 I examined a foundational premise of the status and respect sensitivity hypothesis: Adolescents will show a weaker response to an intervention when they are in environments that they perceive to be disrespectful. To do so, I analyzed data from an intervention that sought to instill a growth mindset—the belief that intelligence can change and grow through effort and good strategies—and I examined whether the effects were weaker when adolescents reported feeling disrespected by their teachers. The data come from the National Study of Learning Mindsets (NSLM), which was a randomized field experiment conducted in a nationally representative sample of 9th graders attending U.S. public high schools in 2015-2016 (Yeager et al., 2019). Previous analyses have found that the intervention changed students' mindset beliefs, challenge-seeking choices, and grades, but these results were heterogeneous across school and teacher contexts (Rege et al., 2021; Yeager et al., 2019, 2022). Here we extend these findings by examining a novel source of heterogeneous effects: students' feelings of respect from their teachers.

As mentioned in Ch. 1, moderation seen in prior interventions can be thought of as individual differences (e.g., traits, beliefs, backgrounds) and contextual factors (e.g., teacher beliefs, peer norms, affordances) which each fall into similar patterns. Moderation by individual differences tends to be negative (greater among more at risk students) and moderation by contextual factors tends to be positive (greater among more supportive environments). Another interesting pattern relates to proximal (immediate post-treatment) versus longitudinal effects (long-term effects). For individual differences, moderation of treatment effects is present for proximal outcomes (e.g., mindset beliefs after a mindset intervention) and longitudinal outcomes (e.g., GPA, first-year completion). Meanwhile, moderation by contextual effects tend to occur more with longitudinal outcomes. Meaning

that, in general, participants' initial response to the intervention are similar across contexts yet differ when looking at long-term outcomes. For instance, prior analyses of the NSLM found that teachers' mindset of intelligence belief moderated the treatment effect of the intervention on end of the year math GPA, but not with post-test manipulation checks of students' mindset beliefs (Yeager et al., 2022).

This observation leads to the natural question of what a respect moderation of the treatment effects will look like. If it is a contextual factor (i.e., something about the classroom ecology) we would expect to see positive moderation (greater effects among high respect contexts) on longitudinal (math GPA) but not proximal outcomes (mindset beliefs). If it is more of an individual difference, we might expect see a negative moderation (greater effects among low respected individuals) on both longitudinal and proximal outcomes. However, the observed effect may be a product of how respect is operationalized, as either a within- or between-classroom effect. It may be that individual variations in respect (within: classroom-centered) behave in ways similar to individual difference variables (negative interaction across outcomes) while between classroom respect (between: mean classroom respect) behaves in ways similar to contextual factors (positive interaction with longitudinal outcomes).

As a result, I will first test whether there is moderation by either within-classroom respect, suggesting that individual variation in the perception of respect will relate to treatment effects, or between-classroom respect, suggesting that classroom context will relate to treatment effects. Next, I will test where in the process respect is moderating the treatment effects; namely in more proximal or longitudinal outcomes.

METHODS

Participants

The National Study of Learning Mindsets (NSLM) was a randomized trial and longitudinal study conducted with nationally representative sample of over 16,000 ninth grade students in 76 public schools in the United States during the 2015-16 school year (see Yeager et al., 2019). The NSLM evaluated a student growth mindset intervention in a nationally representative sample of students in U.S. public schools. Details on the study sample and procedures appear in Yeager (2019).

The present study's focus on experiences of respect or disrespect from math teachers required the analyses to focus on the subset of students whose records could be matched to their math teachers and who reported respect from their math teachers. Therefore, the starting sample for this analysis was the analytic dataset from Yeager et al. (2022), which reported analyses of math teachers' beliefs as moderators of the treatment effect only among participants who took math after the intervention and could be linked to a math teacher (see the supplement to that paper for an analysis of national representativeness of the dataset). Of the N = 16,302 students in the Yeager et al. (2022) dataset: 1,514 students were not assigned a treatment condition, 4,501 could not be matched to a math teacher (due to lack of administrative data or unclear teacher assignment), 3,214 were missing some demographic information (race, gender, and/or SES) that could not be filled with administrative sources, and 4,144 did not have grade data (i.e. no post-treatment math grade or prior achievement).

Therefore, the analytic sample was N = 9,076 students nested within 377 teachers for our focal analysis using math GPA as the outcome. Of these students, 3.5% identified as Asian, 9.9% as Black/African American, 20.6% as Hispanic, 54% identified as White,

and 11.9% as from another racial group (e.g., Middle Eastern, Pacific Islander, etc.). 49.4% of the sample were female, 60.3% were from families with low socioeconomic (SES) backgrounds, and the average age was 14.92 (based on age at start of intervention). The sample was evenly distributed between the control (50.8%) and treatment conditions (49.2%).

Procedures

National Study of Learning Mindsets. In the NSLM, the treatment group received a short (<50-minute), online, classroom-based, two-session growth mindset intervention in which they learned about how the brain learns and develops and what that means for schooling. The control group received a general lesson about adolescent brain development that was not explicitly tied to the idea of growth and malleability. Participants completed one of these exercises at the beginning of the 9th grade school year. Their academic achievement was tracked until the end of the school year, when administrative data were obtained from schools. Students completed survey measures of feelings of teacher respect prior to the first treatment session (one item) and after the second session (four items).

Growth mindset intervention. The growth mindset intervention involved three elements that, collectively, aimed to persuade students that intelligence can grow and change through effort and improved strategies (Dweck & Yeager, 2020). These elements were scientific information (e.g., that the brain is made up of networks of neurons, and these networks grow more efficient when the brain works on rigorous learning challenges), descriptive norms (e.g., stories from upper-year students who describe how they came to act on their growth mindset beliefs), and writing exercises (e.g., so-called "self-persuasion" prompts in which participants attempt to persuade a future student to adopt more of a

growth mindset; see Aronson et al., 2002). The control condition focused on brain functioning but did not include information about intelligence beliefs.

The growth mindset intervention was designed to be respectful. More specifically, the growth mindset information is presented in a way that acknowledges student's current competence and effort, students are explicitly asked for their own thoughts and opinions to improve the message, and students actively participate in the messaging through a writing exercise (Yeager et al., 2016). All of these elements were thought to respect student's abilities and autonomy. This respectfulness was important, because if intervention materials themselves were disrespectful then they would not be expected to be effective even in respectful classroom environments.

Measures

Feelings of Respect. The focal moderating measure of respect was measured through a composite of ratings of five statements from 1 = *Not at all true* to 5 = *Extremely True*. To get a reliable measure of the overall experience of respect in the school, the statements assessed two highly-correlated elements: direct reports of respect (e.g. "My math teacher treats me with respect") and trust (e.g. "I trust my math teacher"), which is an immediate consequence of being respected or disrespected according to established theories of trust (Bryk & Schneider, 2002; Tyler, 2006; Tyler & Blader, 2003; Tyler & Jackson, 2014). The items asked separately about the math teacher (above), and about "teachers and other adults at my school." Only one item was administered at baseline because the NSLM study design restricted survey space during the first session of the treatment to only single item composites, in order to avoid interfering with the treatment message. At post-test, the full four items were administered (about respect/trust, for

math/all adults). All five items were combined by taking their unweighted average and had good fit ($\alpha = 0.84$).

Because analyses used items assessed at post-test, the treatment could have influenced how students respond to the respect measures. Notably, presenting material in a respectful manner to students was a key design principle to the NSLM treatment. Preliminary analyses showed that the results were not likely to be due to this feature of the NSLM study design, in that they did not find significant treatment effects on the respect composite, $p = 0.99$ (see Table 1), or the individual items, ps $> .11$. In addition, when we re-conducted analyses using just the single baseline item, rather than the more reliable five-item composite, we found the same overall pattern of results (see Supplement Section 1).

Within-Classroom Respect. To examine whether students subjective experience of respect moderated treatment effects, I centered respect within classrooms by subtracted the classroom (defined by math teacher) mean of respect from students individual rating of respect. This measure represented how respect or disrespected students felt relative to their classroom peers. While the average was 0 (given it is centered), the standard deviation of within-classroom respect was 0.77 and interquartile range was -0.45 - .53.

Between-Classroom Respect. To examine whether the average classroom feelings of respect moderated treatment effects, I computed the average feeling of respect for each classroom (defined by math teacher). This measure represented the student consensus on how respectful a classroom context was on average. Between-classroom respect had an average of 3.73, a standard deviation of 0.29, and interquartile range of 3.54 – 3.93.

Fixed Mindset. Fixed mindsets were assessed prior to the intervention (as a covariate) and after the second session of the intervention (as a manipulation check). Fixed mindset beliefs were an aggregate of two items that were rated on a scale from 1 = Strongly agree to 6 = Strongly disagree. They were "You have a certain amount of intelligence, and

42

you really can't do much to change it" and "Your intelligence is something about you that you can't change very much." A composite was created by taking the unweighted average ($\alpha = 0.72$).

Challenge Seeking. Challenge seeking was assessed by the make-a-worksheet task in which students are asked to create a practice worksheet of math problems. Students could choose from a list of easier or harder problems for a total of 8 practice problems. The pre-registered challenge-seeking variable is the number of harder problems minus the number of easier problems (higher means more challenge-seeking), thus having a range of 8 (meaning all hard problems picked) to -8 (meaning all easy problems picked). This operationalization of challenge seeking (hard minus easy problems) predicted 10th grade math course taking and was validated in prior pre-registered study using the NSLM data (Rege et al., 2021).

Math Achievement. Our main outcome of interest was math course GPA in semester following the intervention. This measure was obtained from administrative sources in each participating school and transformed into a standardized measure ranging from 0 (F) to 4.3 (A+).

Covariates. We included several covariates based on the pre-registration of the NSLM analysis reported in Yeager et al. 2019 (https://osf.io/afmb6). These included: pre-intervention GPA in math, self-reported expected math achievement, gender, underrepresented racial minority status, and socio-economic status (parental education). Pre-intervention math GPA was taken from the semester prior to the intervention (8th grade if the intervention was given in the fall or Fall 9th grade if the intervention was given in the spring) using administrative data. Self-reported expected math achievement was measured with the item, "Thinking about your skills and the difficulty of your classes, how well do

you think you'll do in math in high school?" and measured in a 1-7 scale (extremely poorly – extremely well).

Gender and Race were self-reported at the end of the intervention survey and filled in using administrative data when available. Gender was a binary variable (0: Male, 1:Female). Race was transformed into a binary variable representing underrepresented racial minority status which was coded as 1 if a student identified as Black, Hispanic, Middle Easter, Native American, and/or Pacifica Islander and 0 if they did not identify with any of these racial groups. Socio-economic status was computed using a combination of mother's education level and free/reduced lunch participation, following prior validation analyses (Destin et al., 2019). Students were considered low SES when they reported their mother had less than a bachelor's degree, schools reported them as having free/reduced lunch, or when students who reported not knowing their mother's education.

The BCF model does not allow for missingness in the analytic data. Thus, instead of list-wise deletion of cases with missing covariate we used the dummy method (imputing a zero or the sample mean, then including a dummy variable indicating whether an imputation was used). For nearly every covariate, this applied to less than 2% of cases. Pre-intervention Math GPA was the only exception, where about 16% of cases were imputed using the mean. No imputation was conducted for outcome data.

Modeling Approach: Bayesian Causal Forest

We conducted analyses using a Bayesian Causal Forest (BCF) approach (Hahn et al., 2020; Yeager et al., 2019). BCF is a specific use of Bayesian statistics and machine learning that is optimized to estimate heterogeneous treatment effects sizes across multiple potential moderators that could interact non-parametrically. Thus, this approach is

uniquely suited to detect the moderating nature of feeling respected on the magnitude of the growth mindset treatment.

BCF models are an adaptation of previously established BART (Bayesian Additive Regression Trees) methodologies (Hill et al., 2020). BCF has two primary advantages over the conventional frequentist regression approach. First, treatment heterogeneity is regularized separately from other covariates. What this means is that the machine-learning process for using information from covariates to produce a more precise estimate of the treatment effect (e.g., adjusting for chance failures of randomization within classrooms) is separate from the machine-learning process for moderators, thus avoiding a problem called "regularization-induced confounding," (Hahn et al., 2020). Second, BCF uses a flexible, "tree-based" method to identify moderation, which allows it to detect non-linear moderation. In doing so, BCF applies conservative prior distributions to avoid overfitting to the data. This feature results in "shrinkage towards heterogeneity", i.e. it can detect complex moderation if it is present, but not if moderation is pure noise. BCF has been shown to be more robust and performs more reliably when put head-to-head with other methods for drawing causal inferences in open data competitions (see Hahn et al., 2020 for explanation and examples). All analyses for this study were conducted in RStudio using the multibart and possum packages (Murray et al., 2022). A more traditional mixed effects linear regression found similar results (see Supplement Section 2).

RESULTS

Preliminary Analyses

Random Assignment. We first confirmed that the treatment groups did not differ in feelings of respect: the treatment (M = 3.78) and control (M = 3.77) did not significantly differ (see Table 1, Row 1), indicating random assignment was successful and that the

intervention content did not lead to differences in respect levels. The latter point is important, as the growth mindset intervention did not lead to students feeling more respect in their classrooms despite prior research showing the content itself was perceived as being respectful (Yeager et al., 2016).

Next, there was balance across the two experimental groups in terms of covariates: Prior Math GPA, expectations of success, white vs. non-white racial or ethnic identity, SES, or gender (ps > .25; see Table 1). These tests indicate that random assignment was successful for both the main moderator and covariates.

Correlations between Respect, Covariates, and Outcomes. Initial correlational analyses revealed positive relationships of students' feelings of respect in their classroom with prior GPA ($r = .095$, $p < .001$) and self-reported expectations of success ($r = .221$, $p < .001$). Feelings of respect were not related to with non-white status ($r = -.01$), but related to SES ($r = -.034$, $p = .001$) and gender ($r = -.024$, $p = .022$). This result is somewhat consistent with theories of stereotype threat (Cohen & Steele, 2002), which might predict that marginalized groups in mathematics (minority students, girls, and low-SES) may feel less respected in their classrooms compared to other students.

We next examined whether feelings of respect were related to any of the outcome measures (post-treatment math GPA, the worksheet task, and fixed intelligence beliefs) among the control group only. Feelings of respect were positively related to both post-treatment math GPA ($r = 0.168$, $p < .001$) and picking more hard problems on the worksheet task ($r = 0.128$, $p < .001$), and negatively related to fixed intelligence beliefs ($r = -0.165$, $p < .001$).

Variable	Control *M (SD)*	Treatment *M (SD)*	*t*	*p*
Feelings of Respect	3.74 (0.82)	3.74 (0.83)	-0.007	0.994
Prior Math GPA	2.79 (1.09)	2.76 (1.11)	1.170	0.242
Achievement Group	5.21 (1.12)	5.19 (1.15)	0.788	0.431
Math Expectations	0.51 (0.50)	0.52 (0.50)	-0.430	0.667
Post-Treatment Respect	3.96 (0.95)	3.97 (0.98)	-0.576	0.565
Session 1 Respect Item Only	3.70 (1.1)	3.67 (1.10)	1.141	0.254
	Control %	**Treatment %**	χ^2	*p*
Minority Status	50.6%	50.6%	<0.001	0.986
Female	49.3%	49.7%	0.164	0.685
Low SES	59.6%	60.4%	0.650	0.420

Table 1: Comparison of control vs. treatment groups and missing vs. analytic samples across several key variables.

Note: For continuous variables (top rows), we report group means and standard deviations along with the *t*-test statistic and *p*-values comparing the groups. For categorical variables (bottom rows), we report what percentage of each intervention group has each characteristic, the chi-squared value, and *p*-value for between groups.

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Feelings of Respect	0	0.77									
2. Prior Math GPA	0.07	0.87	.10** [.07, .12]								
3. Math Expectations	5.20	1.13	.22** [.20, .24]	.37** [.35, .39]							
4. Minority Status	0.51	0.50	-0.01 [-.03, .01]	-.15** [-.17, -.13]	-.15** [-.17, -.13]						
5. Low SES	0.6	0.49	-.03** [-.05, -.01]	-.15** [-.17, -.13]	.17** [.15, .19]	.22** [.20, .24]					
6. Gender	0.5	0.50	-.02* [-.04, -.00]	.17** [.15, .19]	-.05** [-.07, -.03]	0.00 [-.02, .02]	0.02 [-.01, .04]				
7. Low Achiever	0.52	0.50	-.09** [-.11, -.07]	-.63** [-.64, -.61]	-.32** [-.34, -.30]	.16** [.14, .18]	-.23** [-.26, -.21]	-.16** [-.18, -.14]			
8. Post Math GPA	2.50	1.22	.17** [.14, .20]	.56** [.54, .58]	.42** [.40, .45]	-.20** [-.23, -.17]	.16** [.14, .18]	.18** [.15, .21]	-.52** [-.54, -.49]		
9. Challenge Worksheet	-0.19	3.86	.13** [.10, .16]	.11** [.08, .14]	.20** [.17, .23]	0.01 [-.02, .04]	-.06** [-.09, -.03]	-.06** [-.09, -.03]	-.10** [-.13, -.07]	.14** [.11, .17]	
10. Fixed Mindset	2.48	1.17	-.17** [-.19, -.14]	-.14** [-.17, -.11]	-.20** [-.23, -.17]	.12** [.09, .15]	.09** [.06, .11]	-0.02 [-.05, .01]	.15** [.12, .18]	-.20** [-.23, -.17]	-.16** [-.19, -.13]

Table 2. Means, standard deviations, and correlations with confidence intervals.

Note. M and SD are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. * indicates p < .05. ** indicates p < .01.

Main Analyses

Preview of BCF analysis methods. As these analyses use BCF, which produce posterior distributions rather than test statistics (e.g., *p*-, *t*-, *F*-values), the results focus on effect size estimates, uncertainty intervals, and continuous probabilities rather than null hypothesis significance testing. In these analyses specifically, we focus on a comparison of the magnitude of the treatment effect on post-test math GPA at different levels of perceived respect. Analyses using a more traditional mixed effects regression model revealed a similar pattern of results (see Supplement Section 3).

The posterior distributions yielded by BCF analyses allowed for categorical moderation analyses (i.e., comparisons of treatment effects participants in different "bins") without affecting the rate of false discoveries. This is because the model is fit once, and summarizing the posterior distribution in different ways does not affect the underlying model parameters and uncertainty. Therefore, we present results in two ways: first with a continuous moderation by respect, and second when binning students into terciles based on their respect levels relative to peers in the same classroom. Each tercile group represents an equal 33% of the sample, labeled Low, Mid, and High. Importantly, in the BCF model we treated the respect variable as continuous; the group label was only used to interpret the posterior.

Within vs. Between-Classroom Effects. Interestingly, I only found moderation when respect was scored as a difference from the classroom mean (i.e. the *within-classroom* variation), not when scored as a classroom mean (i.e. the *between-classroom*

variation). Figure 1 demonstrates that there is only a moderation of the treatment effects when looking at the classroom centered variable of respect.
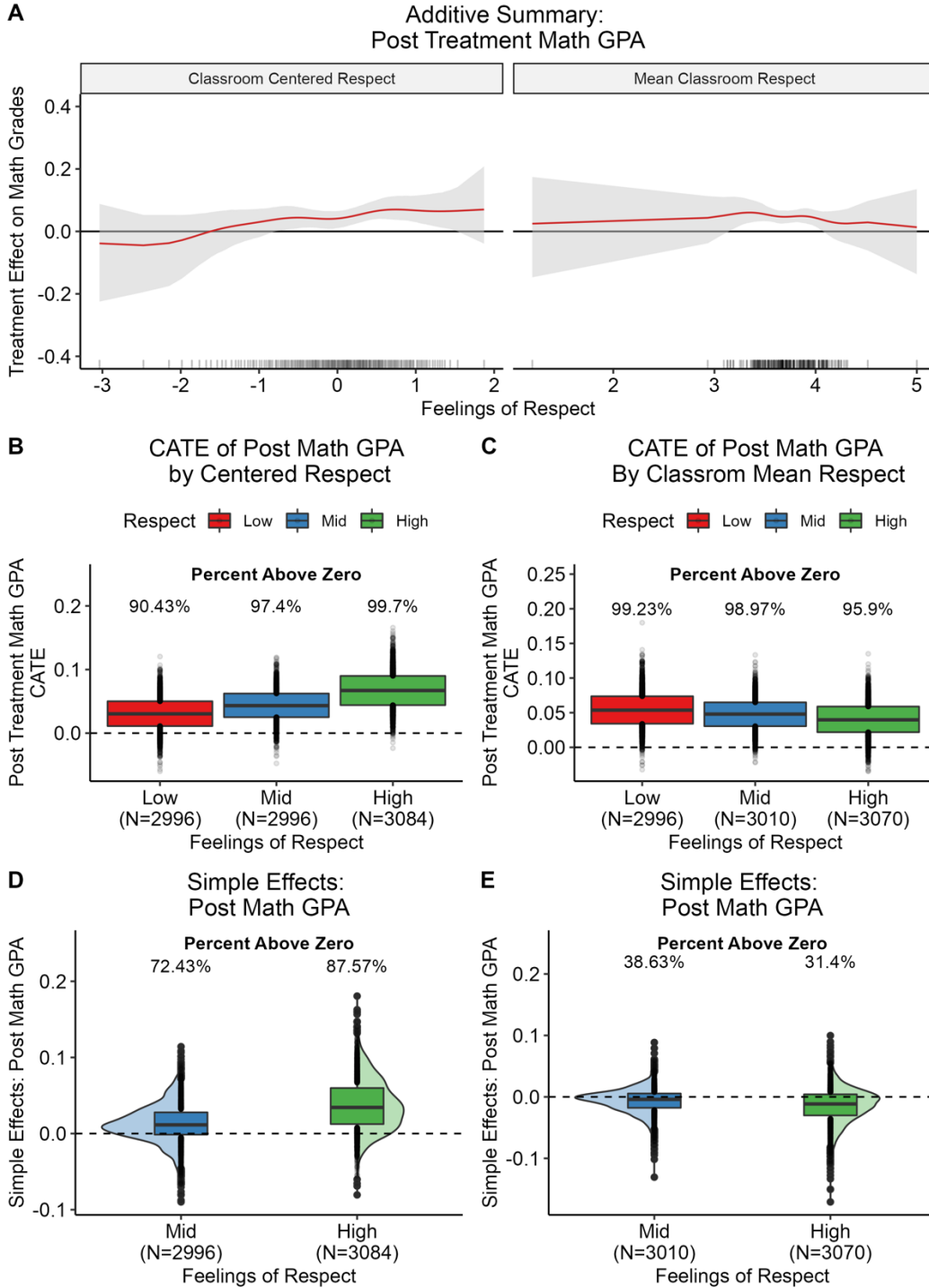
Figure 1: Results of BCF analysis of growth mindset treatment effects on math GPA by within-classroom and between classroom respect.

Note: Panel A: Additive summary of the posterior distribution for each level of feelings of respect holding all covariates to the sample mean showing the relative treatment effect of within-classroom respect on the right and between-classroom respect on the right. Panel B: Boxplot of each level of within-classroom respect's posterior distribution of CATEs for post math GPA, with labels of what percent of the distribution is above 0. Panel C: Boxplot of each level of between-classroom respect. Panel D: Boxplot of the difference posterior distributions of the Mid and High within-classroom respect groups compared to the Low respect groups. Panel E: Boxplot of the difference posterior distributions of the Mid and High between-classroom respect groups.

Within-Classroom Respect			
Posterior distribution of CATEs			
Respect Group	M (SD)	% Above Zero	$10^{th} - 90^{th}$ Range
Low	0.03 (0.02)	90.43%	0.011 - 0.05
Mid	0.043 (0.02)	97.40%	0.025 - 0.062
High	0.068 (0.03)	99.70%	0.044 - 0.09
Difference Compared to Low Group			
Mid	0.013 (0.03)	72.43%	0.005 - 0.032
High	0.037 (0.03)	87.57%	0.008 - 0.066
Between-Classroom Respect			
Posterior distribution of CATEs			
Respect Group	M (SD)	% Above Zero	$10^{th} - 90^{th}$ Range
Low	0.054 (0.02)	99.23%	0.034 - 0.074
Mid	0.048 (0.02)	98.97%	0.031 - 0.065
High	0.04 (0.02)	95.90%	0.022 - 0.059
Difference Compared to Low Group			
Mid	-0.006 (0.02)	38.63%	-0.021 - -.008
High	-0.014 (0.03)	31.40%	-0.035 - 0.008

Table 3: Summary of the Posterior Distribution of CATEs for Growth Mindset Intervention Effects on Math GPA by Within- vs. Between- Respect

Table 3 contains the conditional average treatment effect (CATE) for each level of respect,; only within-classroom respect seems to be moderating the treatment effect on math GPA. There is little to no variation of CATEs by between-classroom, as seen by the average difference in CATEs being low and a small majority of the difference distribution being below 0. See Supplement Section 3 for the linear model output that replicate this finding.

Moderation of Effects on Post-Treatment Math GPA (Longitudinal). As shown in Figure 2 Panel A, feelings of respect moderated the treatment effect of the growth mindset intervention. Treatment effects were higher effects at greater levels of respect. Panel A depicts the additive summary of the posterior's conditional average treatment effects of the intervention across the levels of respect (holding the covariates to the sample mean). The solid black line represents the posterior mean of the conditional average treatment effect (CATE) at each level of respect. The bands represent the IQR for 90% of the posterior distribution of CATEs. The figure is colored according to the respect level group. We see a clear positive trend whereby the intervention effect is greater at higher levels of respect. Panel B quantifies these differences by depicting a boxplot based on the posterior distributions of the CATE for each level of respect. A CATE greater than zero would mean that the intervention was successful at shifting post math GPA of students. Means, SDs, the proportion of the distribution above 0, and the 10th to 90th %ile posterior density intervals are reported in Table 2. This shows a positive average CATE for each group, Low (M =.032), Mid (M =.046), and High (M =.079). Most CATEs were above zero for each group, 89% of Low, 97% of Mid, and 99% of High. Panel C depicts the difference in distributions between the Mid and High respect group from the Low respect group (letting us see the difference in CATEs more clearly).
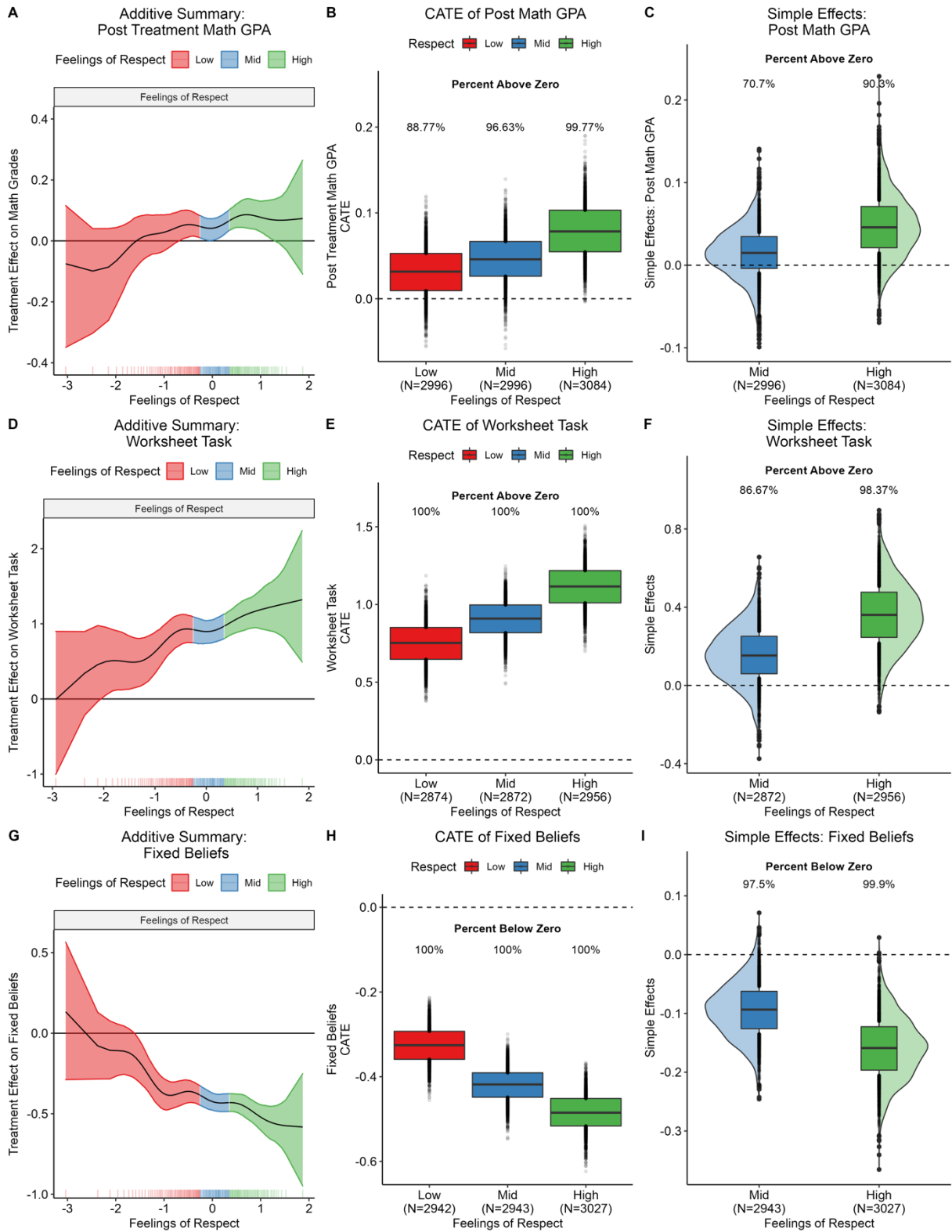
Figure 2: Results of BCF analysis of growth mindset treatment effects for each outcome
          moderated by respect.

Note: Panel A: Additive summary of the posterior distribution for each level of feelings of respect holding all covariates to the sample mean showing the relative effect of respect on post math GPA. Panel B: Boxplot of each level of respect's posterior distribution of CATEs for post math GPA, with labels of what percent of the distribution is above 0. Panel C: Boxplot of the difference posterior distributions of the Mid and High respect groups compared to the Low respect groups showing the estimated difference in moving from one group to another for post math GPA. Panel D: Additive summary of posterior for each level of respect on the effect of the number of difficult problems chosen on the worksheet task. Panel E Posterior distribution of CATEs by respect group for the worksheet task. Panel F: Difference in posterior distributions of Mid and High respect groups compared to Low respect group for the worksheet task. Panel G: Additive summary of posterior distribution for each level of respect on the effect on fixed intelligence beliefs. Panel H: Boxplots of the posterior distribution for each level of respect's CATE on fixed intelligence beliefs. Panel I: Difference in posterior distributions comparing Mid and High respect levels to Low respect for fixed intelligence beliefs.

	Math GPA		
	Posterior distribution of CATEs		
Respect Group	*M* (*SD*)	% Above Zero	$10^{th} – 90^{th}$ Range
Low	0.031 (0.03)	88.77%	0.009 - 0.053
Mid	0.046 (0.02)	96.63%	0.026 - 0.067
High	0.079 (0.03)	99.77%	0.055 - 0.103
	Difference Compared to Low Group		
Mid	0.015 (0.03)	70.70%	-0.009 - 0.039
High	0.047 (0.04)	90.30%	0.051 - 0.078

Table 4: Summary of the Posterior Distribution of CATEs for Growth Mindset
          Intervention Effects on Math GPA

Proximal Outcomes.

Make-a-Worksheet Task: When looking at the number of difficult problems chosen during the worksheet task immediately after the treatment as the outcome, a similar pattern of results emerged. Namely, there was a positive moderating effect of feelings of respect on the treatment effect such that we saw greater treatment differences at higher

levels of respect. Panel D in Figure 2 depicts this positive trend in the treatment effect as a function of a continuous respect moderator. Panel E in Figure 2 most clearly demonstrates this trend as the average CATE for High respect level (M = 1.114) is greater than the Mid (M = .907) and Low (M = 0.751) levels. Unlike the math GPA outcome, there seems to be positive CATEs for every level of respect, rather than seeing a null effect at even the lowest levels of respect.

Worksheet Task			
Posterior distribution of CATEs			
Respect Group	M (SD)	% Above Zero	$10^{th} - 90^{th}$ Range
Low	0.751 (0.12)	100%	0.647 - 0.852
Mid	0.907 (0.11)	100%	0.818 – 0.997
High	1.114 (0.12)	100%	1.011 - 1.218
Difference Compared to Low Group			
Mid	0.155 (0.14)	86.67%	0.039 - 0.276
High	0.362 (0.17)	98.37%	0.217 - 0.506

Table 5: Summary of the Posterior Distribution of CATEs for Growth Mindset Intervention Effects on the Worksheet Task

Fixed Mindset Beliefs: I found the expected negative moderating effect of feelings of respect on the treatment effect such that we saw larger treatment differences (greater reduction in fixed mindset beliefs) at higher levels of respect. Panel G in Figure 2 depicts this negative trend in the treatment effect as a function of a continuous respect moderator. Panel E in Figure 2 most clearly demonstrates this trend as the average CATE for High respect level (M = -0.485) is stronger than the Mid (M = -0.419) and Low (M = -.326) levels. Like the worksheet task, there seems to be positive CATEs for every level of respect.

Fixed Beliefs			
Posterior distribution of CATEs			
Respect Group	*M* (*SD*)	% Below Zero	$10^{th} - 90^{th}$ Range
Low	-0.326 (0.04)	100%	-0.359 - -0.293
Mid	-0.419 (0.04)	100%	-0.448 - -0.391
High	-0.485 (0.04)	100%	-0.516 - -0.451
Difference Compared to Low Group			
Mid	-0.094 (0.05)	97.50%	-0.135 - -0.054
High	-0.159 (0.05)	99.90%	-0.205 - -0.114

Table 6: Summary of the Posterior Distribution of CATEs for Growth Mindset Intervention Effects on the Fixed Mindset Beliefs

Subgroup Analysis by Race, Gender, and SES. Given that students reported feeling less respected based on some identity grouping (gender and SES) in this sample, I also explored whether any higher order interactions were present. In order words, did identity subgroups differ in how respect related to treatment effects? I found no evidence for subgroup differences in how respect moderated treatment effects on math GPA based on underrepresented racial minority status, gender, or SES (see Supplement Section 4). The effect of respect on treatment effects seems to be similar across each of these subgroups.

STUDY 1 DISCUSSION:

Study 1 revealed four main findings. First, the study showed that these moderation patterns were apparent primarily for the *within-classroom* variation in ratings of respectful treatment, not for the *between-classroom* variation. This suggests that it was something about how a student idiosyncratically experienced a teacher's classroom culture—perhaps driven by the student's personal characteristics or history—and the moderation was not about what the student consensus was about the teacher's classroom. This is important because it suggests that even in classrooms where a teacher attempts to respect all students, the minority of students who nevertheless feel disrespected may still be reluctant to change. This final finding suggests that it is important to look more closely on how students idiosyncratically and individually discern respect in a classroom, so that more comprehensive and practical guidance may be given to teachers in the future.

Second, it showed that students' reports of feeling respected by their math teachers were meaningful moderators of the growth mindset intervention effects on math grades. This was important because it showed that even in a circumstance in which researchers had applied the science of "wise" interventions to develop respectful materials, a feature of the context (i.e., respect from teachers) could turn "off" the effects of that effective intervention. This is the strongest illustration to date of a core tenet of the status and respect sensitivity hypothesis. This also justifies the present dissertation's focus on adolescent feelings of respect as a target of study in the pursuit of a better understanding of adolescent behavior-change.

Third, the study showed a similar pattern of moderation for immediate outcomes: a manipulation check (fixed mindset beliefs) and a behavioral task (the make-a-worksheet task). This finding was not a foregone conclusion, because it would have been possible to have the weaker effects of the growth mindset treatment emerge only over time, and

57

manifest only in grades, after repeated exposure to a disrespectful environment. Instead, it appears that the disrespectful classroom context *at the moment of treatment delivery* caused adolescents to close their ears to the growth mindset message. This interpretation is supported by the finding of far weaker immediate effects on post-test attitude and behavior change.

Fourth, the moderation of treatment effects on Math GPA by feelings of respect did not seem to differ among subgroups based on underrepresented racial minority status, gender, or SES. This results is somewhat surprising given prior work on stereotyping and discrimination (e.g. see Cohen et al., 2012; Crocker et al., 1991), and may suggest more complexity when thinking about the role identity groups play in respect's relationship to educational interventions. Implications for this are discussed more in Ch. 5.

The results of this study have implications for the status and respect sensitivity hypothesis (Yeager, Dahl, & Dweck, 2017), in that it provides direct empirical evidence. Namely, it appears that adolescents are more likely to benefit from an intervention if they also feel respected by adults around them. This result suggests that adolescents are more open to attempts to shift their behavior when they feel respected but are closed off to behavior change attempts when they feel disrespected. This finding then raises the question, "what do adolescents look for in order to feel respected"?

Chapter 3. Examining Adolescents Descriptions of Respect Using Open Coding and Natural Language Processing (Study 2)

INTRODUCTION

Study 1 demonstrated that students' ratings of respect from math teachers were meaningful moderators of the impact of a student-delivered intervention on their math grades, at the end of the school year. This first step leads to my second question: what, exactly, do students find respectful versus disrespectful? In this study, I combine bottom-up qualitative methods with top-down theoretical frameworks to arrive at a comprehensive, yet practical, framework of what lies underneath adolescents' perceptions of a respectful environment. Next, I use the content codes from this qualitative analysis in a Bayesian, machine-learning analysis that seeks to identify the constructs that interact to predict respectful versus disrespectful environments.

METHODS

Participants

This study collected data from 9th and 10th grade students who were recruited as part of a larger study on student well-being and achievement in an urban area in Texas. The data consists of 513 9th, and 10th graders who were 50% female, 59% White, 24% Hispanic, 10% Asian, 2.0 % African American, 4.7% Multiracial, and 19% in a Gifted/Talented Program. Passive consent for participation was gained at the district level so that all students could participate; any student or parents who withdrew from the study also had their data destroyed. In addition, only responses that could be reliably matched to administrative records were included.

Procedure

As part of a daily survey that included other measures that were being piloted for an NIH-funded study of adolescent health, students responded to the question "In general, how much respect do teachers and adults in your school treat you with?". Students chose 1 of 5 options ranging from "no amount" to "an enormous amount". Their responses were then piped in the following prompt:

"You said teachers and adults in your school treat you with _____ of respect. Can you describe a specific time when a teacher did or did not treat you with respect? Please write a few sentences below."

Participants then could write several sentences in response to the prompt before continuing with the survey. Only responses that contained more than 3 words were included in the final analytic dataset ($N = 520$); approximately 33 responses were dropped this way.

Variable	M (SD)	Min	Q25	Median	Q75	Max	N
characters	109.386 (91.31)	11	53	87	140	1252	513
words	26.312 (22.038)	4	13	21	34	295	513
sentences	1.452 (0.997)	1	1	1	2	15	513

Table 7: Descriptive Statistics of Students' Open-Ended Responses

Measures

Self-Reported Respect. Students responded to the question, "In general, how much respect do teachers and adults in your school treat you with?". Responses were on a 5-point scale ranging from "no amount" to "a great amount".

Thematic Coding. We trained several research assistants to code the responses to the open-ended respect prompt along two different frameworks. These frameworks were developed using Self-Determination Theory and Procedural Justice Theory. Each response was coded by two independent coders, then any discrepancies were discussed before assigning a final code. If agreement could not be reached, the first author made a final decision. For each response, codes were applied to each independent thought or idea coded as 1 if present in a positive way, -1 if present in a negative way, and 0 if absent. If a response contained a positive and negative code of the same category, it was coded as 1. See table 7 for further details and examples.

SDT. The SDT framework coding had five categories: Caring (teacher offering support for their well-being and success), Competence (student's ability to complete tasks and have skills), Autonomy (student's ability to act on their own and form own thoughts), Belonging (making the student feel a part of the classroom community), Understanding (efforts to listen to student's point of view), and Equal Individual (treated like their own entity, forged a reciprocal relationship).

Procedural Justice. The procedural justice framework had six categories: Fairness (equal and reasonable in treatment, especially with punishments/rewards), Politeness (showing kindness beyond typical etiquette), Suppressing Bias (presence of judgmental attitudes or favoritism), Truthfulness (honest and open with students, offers "insider knowledge", Autonomy/Process Control (gives voice and power to students in decision making), and Rationales (gives reasoning or justification for decisions, rules, punishments, and procedures).

Academic Press (Standards) and Supports. Mirroring the warm demander framework, we categorized variables to fit along with our theoretical model of Academic Press and Academic Supports. We did so by combining several of these coded categories

to create two aggregate measures. Academic Press is the average of Competence and Equal Individual from the SDT framework. Academic Supports is the average of Caring, Belonging, and Understanding from the SDT framework along with Autonomy, Fairness, and Rationales from the Procedural Justice framework; Both scores range from -1 to 1 with lower scores indicating more negative codes and higher scores indicating more positive codes.

Natural Language Processing. In addition to the human-led coding, we also employed naturalistic language processing algorithms to score and rate each response. We used the politeness package in R to rate each response on several linguistic dimensions (Yeomans et al., 2018). This package was developed to identify different characteristics indicative of polite conversation (e.g., First-person nouns, Hedges, Gratitude, Negations, etc.). We looked at several of these dimensions but focus here on two prominent scores.

Receptiveness. The developers of the politeness package developed a specialized algorithm that combines several of the linguistic features in a single score of receptiveness. This score is based on several different features such as higher agreement, more first-person singular pronouns, fewer negations, and higher gratitude. It has been shown to be similar to human-rated receptiveness and related to more positive interactions (Yeomans et al., 2020).

Emotionality. Each response was rated on the presence of positive (e.g., good, happy, joy) and negative (e.g. bad, angry, sad) emotional language. These scores were then combined so that a 2 meant only positive language, 1 meant both positive and negative language, 0 meant neither, and -1 meant only negative language. Scores ranged from -1 to 2 with higher scores indicating greater positive emotionality.

Analytic Plan

We utilized Bayesian Additive Regression Trees (BART) to estimate the links between each category of ratings on student feelings of respect (Chipman et al., 2010). BART is a machine learning-based modeling approach that has several strengths over a more traditional OLS regression approach. First rather than a simple single regression, BART (like BCF) uses a "sum of trees" approach to understand each predictor's influence on the outcome, allowing for non-parametric and non-linear relationships to emerge. This is important for the current study as feelings of respect could be skewed or bimodal in nature. As a result, the likelihood of finding false negatives is mitigated with BART. Second, BART builds each tree using a regularized prior to prevent over-fitting by penalizing larger trees. This conservative approach in addition to the iterative nature of the sum of trees method results in fewer false positives due to any idiosyncrasies in the data resulting in conservative effect estimates. Notably, strides have been made in allowing for work in higher dimensional spaces (i.e. high number of interacting predictors); which is excellent for our purposes. BART has also been shown to be user-friendly in that it requires less computational resources, less model tuning, and produces uncertainty intervals that are more readily interpretable than other machine learning methods.

In this study, we use a BART to explore the coded teacher practices most predictive of students' feelings of respect. BART is well suited to this task, given we have many candidate teacher practices that may interact in unknown ways. A classical approach would either have us predict what relationships should be present before analysis or rapidly inflate the chance of false positives by testing every combination of predictors. The resulting output of BART is a posterior distribution of the response surface, allowing us to look for trends that naturally emerge from the data. Specifically, we can see each predictor's independent, additive, and interactive effects without biases from post-hoc comparisons.

Category	Prevalence	Example	Relevance to Respect
Academic Press			
<u>Competence</u> Belief in students' skills and abilities	10.00%	*Positive:* "They usually treat me with respect and commend my drive to know more." *Negative:* "they all smart and expect me to be but I'm not, so when that's become clear it seems like they lose respect in me"	Having their effort and capabilities recognized (or lack of) and being presumed instilled a sense that high standards could be met.
<u>Equal Individual</u> Forged reciprocal relationship	12.70%	*Positive:* "Teachers are treating me like the independent thinker that I would like to be" *Negative:* "not treating us as though we were humans with lives, but mindless drones whose sole purpose was to do work."	Often students accused teachers of "babying" or coddling students, which indicated a lack of respect in their intellectual abilities.
Academic Supports			
<u>Caring</u> Support for well-being	50.00%	*Positive:* "one day I was coughing a lot and I had a sore throat so my teacher offered me a water bottle" *Negative:* "Some teachers really don't care what students have to do after school they just want to dump homework on us"	Generally, students interpreted a lack of warmth or attention towards their well-being as disrespectful. Teachers who offered kindness or were aware of the students' lives outside the classroom were more respectful.
<u>Belonging</u> Make students feel a part of the community	12.70%	*Positive:* "They make a classroom setting seem welcoming and not as threatening or overburdening it may seem" *Negative:* " I just don't feel noticed very often."	Students of respectful teachers reported a greater sense of community and efforts to form bonds. Some reported feeling ignored or sidelined by disrespectful teachers.
<u>Understanding</u> Effort to listen to students	16.90%	*Positive:* "My teacher was understanding when I told them I didn't have the assignment and I needed more time." *Negative:* "Sometimes teachers will not listen to you when you try to explain yourself, and steamroll what you say."	Positive responses reported efforts to hear their point of view and/or flexibility about schoolwork. Negative responses reported feeling shut down or silenced when giving explanations about themselves.

<u>Autonomy / Process Control</u> Gave voice and power to students	18.10%	*Positive:* "they allow us to be mostly independent and help us learn at our own pace" *Negative:* "sometimes adults don't let me express my full opinion about something that concerns me."	Positive responses featured having a say in how students learned or how the class was run. Negative responses featured being shut down when expressing independent ideas.
<u>Fairness</u> Reasonable and equal treatment	12.90%	*Positive:* "My teachers give me a fair chance to work on things" *Negative:* "Sometimes I see others get treated worse by a teacher, even though they were in the same situation I am."	Students mentioned teachers who treated everyone equally and as individuals. Negative responses often referred to collective punishments, disproportionate punishments, and/or showing favoritism.
<u>Rationales</u> Offering reasons for behaviors and actions.	4.20%	*Positive:* "When I ask my teachers why I get a certain grade on a project and how I can improve in the future." *Negative:* "my spanish teacher who just throws in random grades and can barely speak to us"	Some students reported teachers giving them explanations for why rules or decisions were made; in addition to reasoning for why they were learning certain material. Most negative responses referred to no explanations given for grading or punishments.
<u>Unbiased</u> Not judgmental or making assumptions about students	6.82%	*Positive:* " Every teacher and adult is very good and respecting everyone no madder the grade they get or any other factor." *Negative:* "He thinks I´m a know it all because I came from a magnet middle school and I used to get tutored at a high level tutoring center"	Some students reported teachers who treated them equally to other students and. Negative responses referred to instances of discrimination based on background or working from assumptions about the student.

Table 8: Coding Scheme for Scoring Positive (+1) and Negative (-1) Responses

RESULTS

Self-Reported Respect

Consistent with the warm demander framework, the BART analysis showed that students who described their teachers as having both academic press (high standards) and high support also rated their teachers as the most respectful. See Figure 3 panel A. As shown in Table 8, the mean respect ratings for students who rated teachers as high in both press and support did not overlap with the 80% interval of any other group, suggesting a meaningful difference.

On the opposite side of the spectrum, also in Figure 3 panel A, teachers who were described by students as having both low academic press and low support were rated as the most disrespectful (i.e., low respect ratings). That group's 80% prediction interval did not overlap with any other group. See Table 8.

Next, we examined the interactive effect of press and support. Figure 3 panel B shows the effect of supports separately for high and low academic press. It shows that the effect of high support on ratings of respect was greater among those who described their teachers as lacking academic press. Figure 3 panel C shows that the two-way interaction effect was meaningfully different from zero. Thus, the data showed that supportiveness was quite meaningful to students, in terms of making them respected, even if the teacher lacked academic press—even more meaningful than when the teacher already had academic press.

Natural Language Processing

As shown in Figure 3 panels D to F, a similar pattern of results was held when examining the natural language processing (NLP) algorithm's score of the text data. The receptiveness scores (which are a proxy for respectful language, Yeomans et al., 2020), again showed that the lack of both press and support yielded the most disrespect-filled

descriptions of teachers, while the combination of both press and support yielded the most respect-filled text. The same results were held when examining positive versus negative emotionality, as shown in Figure 3, panels G to I. See Tables 9 and 10 for the Bayesian inferential statistics and interaction effects.
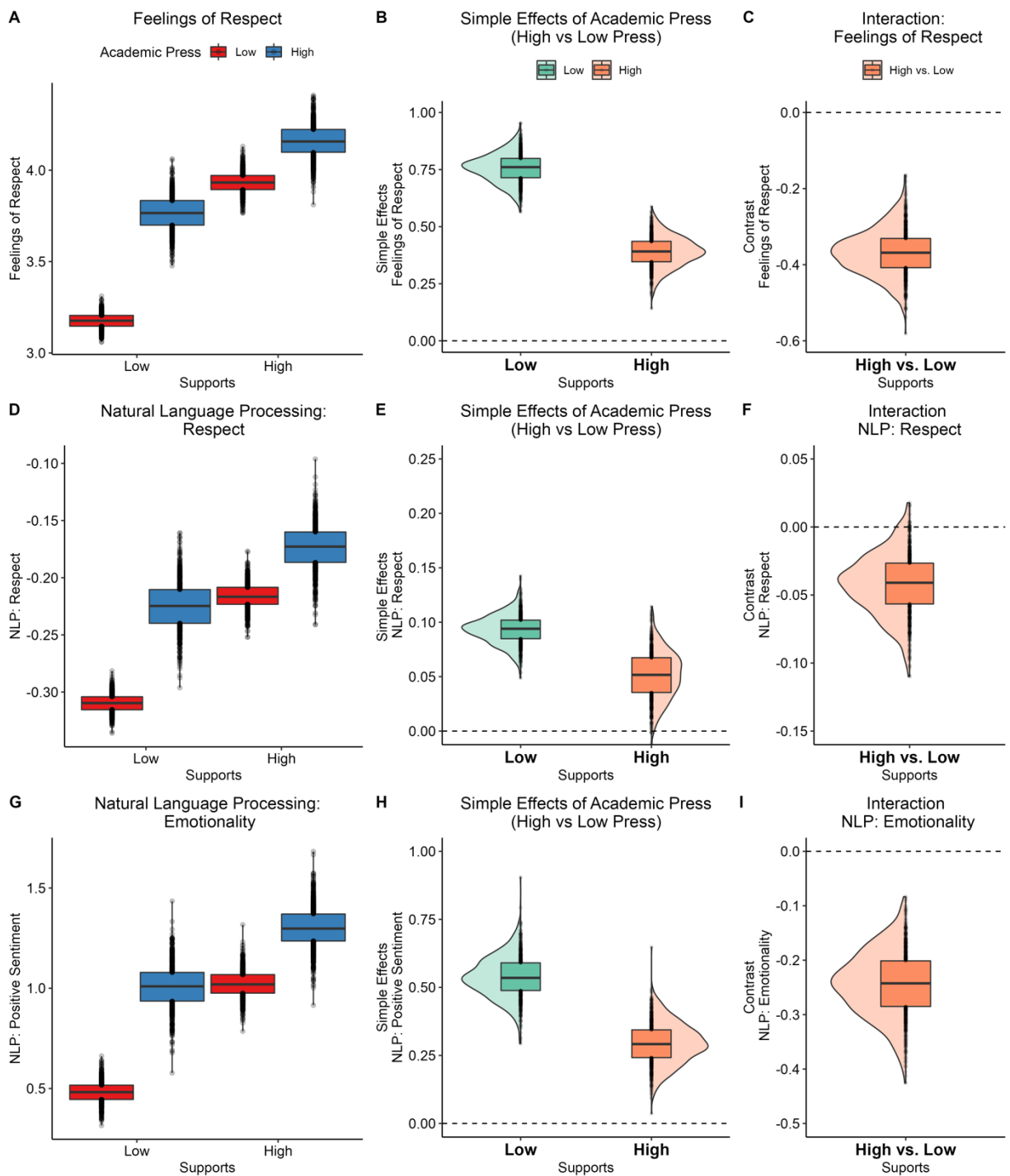
Figure 3. Posterior Distributions from BART Model Predicting Feelings of Respect with Student Descriptions of Teachers' Practices

Note: Panel A: Boxplot of the BART derived posterior distribution of predicted level of respect based on the qualitative coding combination of academic press and support. Panel B: Boxplot of difference posterior distributions of the Low and High press groups by support level, demonstrating the simple effect of academic press on self-reported respect. Panel C: Boxplot of the difference between Low and High support's simple effect of academic press on predicted self-reported respect. Panel D: Boxplot of BART derived posterior distribution based on academic press and support combination on natural language processing score of respect (responsiveness). Panel E: Boxplot of difference posterior distributions of the Low and High press groups by support level, demonstrating the simple effect of academic press on NLP scored respect. Panel F: Boxplot of the difference between Low and High support's simple effect of academic press on NLP scored respect. Panel G: Boxplot of BART derived posterior distribution based on academic press and support combination on natural language processing score of emotionality. Panel H: Boxplot of difference posterior distributions of the Low and High press groups by support level, demonstrating the simple effect of academic press on emotionality. Panel I: Boxplot of the difference between Low and High support's simple effect of academic press on emotionality.

Self-Reported Respect			
Support Level	*Press Levels*	*M* (*SD*)	$10^{th} - 90^{th}$ Range
Low	Low	3.179 (0.04)	3.144 - 3.213
Low	High	3.76 (0.09)	3.684 - 3.836
High	Low	3.933 (0.06)	3.885 - 3.98
High	High	4.152 (0.09)	4.077 - 4.227
Difference by Press Levels		*M* (*SD*)	$10^{th} - 90^{th}$ Range
Low		0.754 (0.06)	0.699 - 0.81
High		0.392 (0.07)	0.333 - 0.449
Support Level Difference by Press Level		*M* (*SD*)	$10^{th} - 90^{th}$ Range
High vs. Low		-0.362 (0.06)	-0.411 - -0.311

Table 9. Student Perceptions of Teacher Respect, by Support and Press Levels, Estimated in a BART Model

NLP Respect (Receptiveness)			
Support Level	*Press Levels*	*M* (*SD*)	10th – 90th Range
Low	Low	-0.309 (0.01)	-0.316 - -0.302
Low	High	-0.225 (0.02)	-0.242 - -0.205
High	Low	-0.216 (0.01)	-0.227 - -0.208
High	High	-0.173 (0.02)	-0.193 - -0.157
Difference by Press Levels		*M* (*SD*)	10th – 90th Range
Low		0.093 (0.01)	0.082 - 0.103
High		0.051 (0.02)	0.033 - 0.071
Support Level Difference by Press Level		*M* (*SD*)	10th – 90th Range
High vs. Low		-0.041 (0.02)	-0.06 - -0.023

Table 10. NLP Algorithm-Scored Levels of Respect (Receptiveness) in Teacher Descriptions, by Support and Press Levels, Estimated in a BART Model

NLP Emotionality			
Support Level	*Press Levels*	*M* (*SD*)	10th – 90th Range
Low	Low	0.483 (0.06)	0.439 - 0.529
Low	High	1.009 (0.11)	0.921 - 1.099
High	Low	1.024 (0.07)	0.963 - 1.083
High	High	1.307 (0.11)	1.215 - 1.406
Difference by Press Levels		*M* (*SD*)	10th – 90th Range
Low		0.541 (0.08)	0.468 - 0.611
High		0.299 (0.07)	0.235 - 0.363
Support Level Difference by Press Level		*M* (*SD*)	10th – 90th Range
High vs. Low		-0.242 (0.06)	0.295 - -0.191

Table 11. NLP Algorithm-Scored Levels of Positivity vs. Negativity (Emotionality) in Teacher Descriptions, by Support and Press Levels, Estimated in a BART Model

DISCUSSION

Study 2 yielded three main findings. First, we found that when high school students were asked to describe their respectful (or disrespectful) teachers, they used concepts that were anticipated by SDT and procedural justice theory. This confirms our suspicion that these theories describe constructs that are relevant to how adolescents discern the levels of respect accorded them by adult authorities.

Second, we found that these categories of ratings could be organized into two super-ordinate categories: academic press and support. Consistent with warm demander models of pedagogy (and with Baumrind's theories of parenting, see Baumrind, 1968, 2013), we showed that the combination of both press and support were potent creators of respectful feelings. Further, a lack of both press and support were especially disrespectful, and even toxic. Overall, this finding suggests that teachers hoping to communicate respect, and motivate positive behavior change in adolescents, can first consider which of the two superordinate categories they need to improve. Secondly, they can select specific practices, presented in Table 7, to work on.

Third, there was an interesting finding that the NLP results showed the same findings as the respect ratings. This result shows that my primary results were not driven by an artifact of the self-report measures and could be replicated using a relatively hands-off NLP scoring method. This was also important because it suggests that future analyses could use the far more efficient NLP method to score the respect ratings of teachers.

Chapter 4. Perception of Respectful Teacher Practices in a National Sample (Study 3)

INTRODUCTION

Study 2 provided preliminary support for the notion that super-ordinate categories of teacher behaviors—academic press and support to meet high standards—could predict students' experiences of respect in the classroom. A limitation of the study, however, is that the coding was limited to the student statements which happened to appear in a short prompt. This means that we could not analyze the impact of *multiple* supports, because students usually only wrote about one. In Study 3, I address this limitation by using data from students' ratings of multiple, theory-derived supports, so that we can examine the effect of providing multiple supports versus simply having more than zero.

In addition, Study 2 used a small sample of convenience, which raises questions about the generalizability of the results. In Study 3, therefore, I return to the NSLM dataset from Study 1, and I examine predictors of students' ratings of respect. I use items pre-written to map onto different constructs that, collectively, could also be organized into the warm demander framework of press and support. Thus, Study 3 provides a test of conceptual replication and generalization of Study 2.

METHODS

Participants

This study uses data from the National Study of Learning Mindsets (NSLM). The dataset included several items related to math teacher practices that students reported on (described below) that were measured before the growth mindset treatment materials were shown. Only students who were linked to their current math teachers (based on administrative data) were included in the dataset. Additionally, given the space constraints

of the survey, students only saw a random subset of teacher practices (discussed in the Methods section), which restricted the number of students in the sample. This led to a final analytic dataset of 6,396 students: 49.9% Female, 56.2% White, 9.6% African American, 22.1% Hispanic, 3.5% Asian, 8.5% another racial group (e.g. Middle Eastern, Native American) and 36% had a mother with a bachelor's degree or higher.

Variable	*Mean* (*SD*)	*Median*	Range
Respect	3.734 (0.823)	3.80	1 - 5
Prior Math Achievement	2.766 (1.101)	3.00	0 - 4.3
Student Math Expectations	5.202 (1.135)	5.00	1 - 7
Teacher Ability	3.71 (0.823)	3.75	1 - 5
Teacher Press	3.703 (0.828)	3.80	1 - 5
Teacher Clarification	3.456 (1.01)	3.67	1 - 5
Teacher Rationale	3.23 (1.088)	3.50	1 - 5

Table 12. Descriptive Statistics for Respect and Candidate Predictors of Respect

Measures

Student's Feelings of Math Teacher Respect. Our main outcome of interest is students' reported feelings of respect from their math teachers based on an aggregate of two-items on a 5-point scale: "I trust my math teacher", and "My math teacher treats me with respect". Rather than have the full five-item aggregate as in Study 1, we only included the math teacher specific items as each of the teacher practices are math teacher specific, while the other respect measures were teacher/adult general. However, using the full suite of measures did not change the pattern of results significantly. As in Study 1, the respect measure was centered within math classrooms such that higher scores reflect relatively higher feelings of respect compared to classmates. This was done to estimate relative changes in feelings of respect within each classroom, which Study 1 found to be the key

moderator for intervention effectiveness. Therefore, these analyses will show how global ratings of teachers' practices predict feelings of respect within classrooms (A supplemental analysis using the untransformed respect variable found a similar pattern of results).

Teacher Practices. Students reported on their math teacher's behaviors and beliefs which served as the predictors of the BART model. These measures were based on the Tripod's 7Cs framework of effective teaching (Ferguson & Danielson, 2015), a validated metric that is shown to relate to positive student outcomes. Some of the subscales were adapted and included as part of the NSLM. In addition, ability beliefs based on previous work on teacher mindsets (Yeager & Dweck, 2012) were also included. For some of the constructs, the NSLM survey randomly displayed a subset of items such that some values for items are missing at random. This missingness was intentional, due to space constraints in the survey; by using an average of each construct we mitigated this for the purpose of analyses. Reliability measures for each construct are discussed.

High Standards were measured by five items based on the Challenge category of the Tripod: "My teacher accepts nothing less than our full effort", "My math teacher asks questions to make sure we are following along…", "In my math class, we learn a lot everyday", "My math teacher doesn't let people give up when the work gets hard", and "My math teacher wants us to use our thinking skills not just memorize things". All items were measured on a 5-point scale and averaged. The NSLM survey randomly displayed four out of the five items due to space limitations. The construct fit was fairly high (α = .83) and did not change substantially if one item was left out (α's =.79). Thus, the average was used in all analyses.

Clarification Support was measured by three items based on the Clarify category of the Tripod: "If I don't understand something, my teacher explains it another way", "My math teacher has several good ways to explain each topic that we cover", and "My teacher

explains difficult things clearly". All items were measured on a 5-point scale and averaged. Much like before, the NSLM survey randomly displayed two out of the three items due to space limitations. The construct fit was very high (alpha = .89) and remained high when one of the items were dropped (alphas > .81); the individual items were highly correlated as well (rs > .74). Thus, the average was used for all analyses.

Rationales Provision was measured by two items based on the Captivate category of the Tripod: "My math teacher explains how what we are learning may be important" and "My math teacher provides reasons for what we are learning in class". Both items were measured on a 5-point scale and averaged into one measure.

Teacher Ability Beliefs were measured by ten items based on past work on Growth mindset and Failure Mindset. While distinct, these are conceptually similar and fit well together (α = .76). These included: " My math teacher let people do assignments over so that they can do better", "My math teacher thinks that some kids are smart and others are not", and "My math teacher thinks failure helps us learn and grow". All items were measured on a 5-point scale and averaged. The NSLM randomly dropped 1-3 of these items at a rate of 20%, such that some students are randomly missing values for some items. As before, the Cronbach's alpha level does not change substantially if any one item is dropped (alphas > .71); thus, the average for each student was used in our main analyses to handle missingness.

Academic Press and Supports. Based on our reading of the literature, we further divided the teacher practices into two categories: Academic Press and Academic Support. Academic Press is the pressure that schools, teachers, and parents exert on students to achieve success: it includes having high standards and expectations for achievement. Academic Support includes many practices and behaviors that are conducive to learning, e.g., organization structures, personalized instruction, collaborative activities, etc. Both of

76

these concepts have been shown to be related both directly and indirectly (through positive behavior) to student achievement (Tomaszewski et al., 2022). While not planned at the conception of the NSLM, these data offer a unique opportunity to test whether student perceptions of respect are related to these core constructs of teacher practice. As such, Academic Press includes the High Standards category (i.e., Challenge) while Academic Support includes Clarification (i.e., Clarify), Rationale Provision (i.e., Captivate), and Ability Beliefs (i.e., Growth and Failure Mindsets).

Covariates. Similar to Study 1, we included several student-level covariates in our BART analysis: gender (coded as Male vs. Female; when students did not answer this item themselves, administrative records were used), mother's education level (bachelor's degree or higher vs. below bachelor's degree), race (White, Black, Latino/a, Asian, and other), math success expectations, and previous achievement in math (standardized GPA for the previous semester supplied by administrative records).

Variable	M	SD	1	2	3	4	5	6	7	8
1. Feelings of Respect	-0.00	0.85								
2. Teacher Press	3.68	0.83	.55** [.53, .57]							
3. Teacher Clarification	3.44	1.02	.56** [.54, .58]	.69** [.67, .70]						
4. Teacher Rationales	3.21	1.09	.44** [.42, .46]	.55** [.53, .57]	.62** [.61, .64]					
5. Teacher Ability Beleifs	3.68	0.77	.37** [.34, .39]	.39** [.37, .41]	.42** [.40, .44]	.27** [.24, .29]				
6. Prior Math Achievement	0.09	0.86	.07** [.05, .10]	.05** [.02, .07]	.01 [-.01, .04]	-.03** [-.06, -.01]	.08** [.06, .11]			
7. Female	0.50	0.50	-.04** [-.06, -.01]	.05** [.02, .07]	-.04** [-.06, -.01]	-.05** [-.07, -.02]	.07** [.04, .09]	.17** [.14, .19]		
8. Low SES	0.60	0.49	-.03* [-.05, -.00]	-.00 [-.03, .02]	.01 [-.02, .03]	.07** [.05, .10]	-.00 [-.03, .02]	-.15** [-.17, -.12]	.02 [-.01, .04]	
9. Minority Status	0.49	0.50	-.00 [-.03, .02]	.02 [-.01, .04]	.04** [.01, .06]	.09** [.07, .12]	-.02 [-.04, .01]	-.16** [-.18, -.13]	.00 [-.02, .03]	.22** [.20, .25]

Table 13: Means, standard deviations, and correlations between feelings of respect and teacher practices.

Note. M and SD represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. * indicates p < .05. ** indicates p < .01.

Analytic Plan

I again used Bayesian Additive Regression Trees (BART) in order to estimate the impact of each category of teacher practices on student feelings of respect (Chipman et al., 2010). The only difference from Study 2 is that we used a multilevel model (with teacher-level random intercepts) to account for nesting of students within teachers.

RESULTS

Individual Practices Linked to Respect

As shown in Figure 4, panel A, all four of the student ratings of teacher practices were positively associated with greater respect. Note that panel A shows the relative effect of each practice, controlling for the others, suggesting that each had an independent relation with ratings of respect in this nationally-representative sample.

Interactive and Additive Effects of Supports and Press

Next, we scored each support (and press) as present or not, and then conducted an analysis that conceptually replicated the findings from Study 2. Figure 4, panel B shows that each addition of a support (a growth mindset classroom culture, instructional support, and autonomy support) was related to higher ratings of respect, consistent with the continuous analysis in panel A. Further, every single support was made more effective when it was accompanied by academic press. As in Study 2, we found that adolescents

79

felt most disrespected when their math teachers lacked both academic press and any supports (bottom left box in Figure 4, panel B). Mean predicted respect values and 10th – 90th percentile range for each combination of press and number of supports.

Interaction effect analyses showed that, as in Study 2, the effect of adding press (i.e., standards) was greatest among adolescents who did not report any supports. See Figure 4, panels C and D. Thus, we replicated a surprising finding from Study 2, which is that adding any respectful practice—either press or support—makes the biggest difference among adolescents who were not receiving anything. Mean differences of the posterior distributions by press, percent of the difference distribution above 0 and 10th = 90th percentile ranges are reported in Table 15.
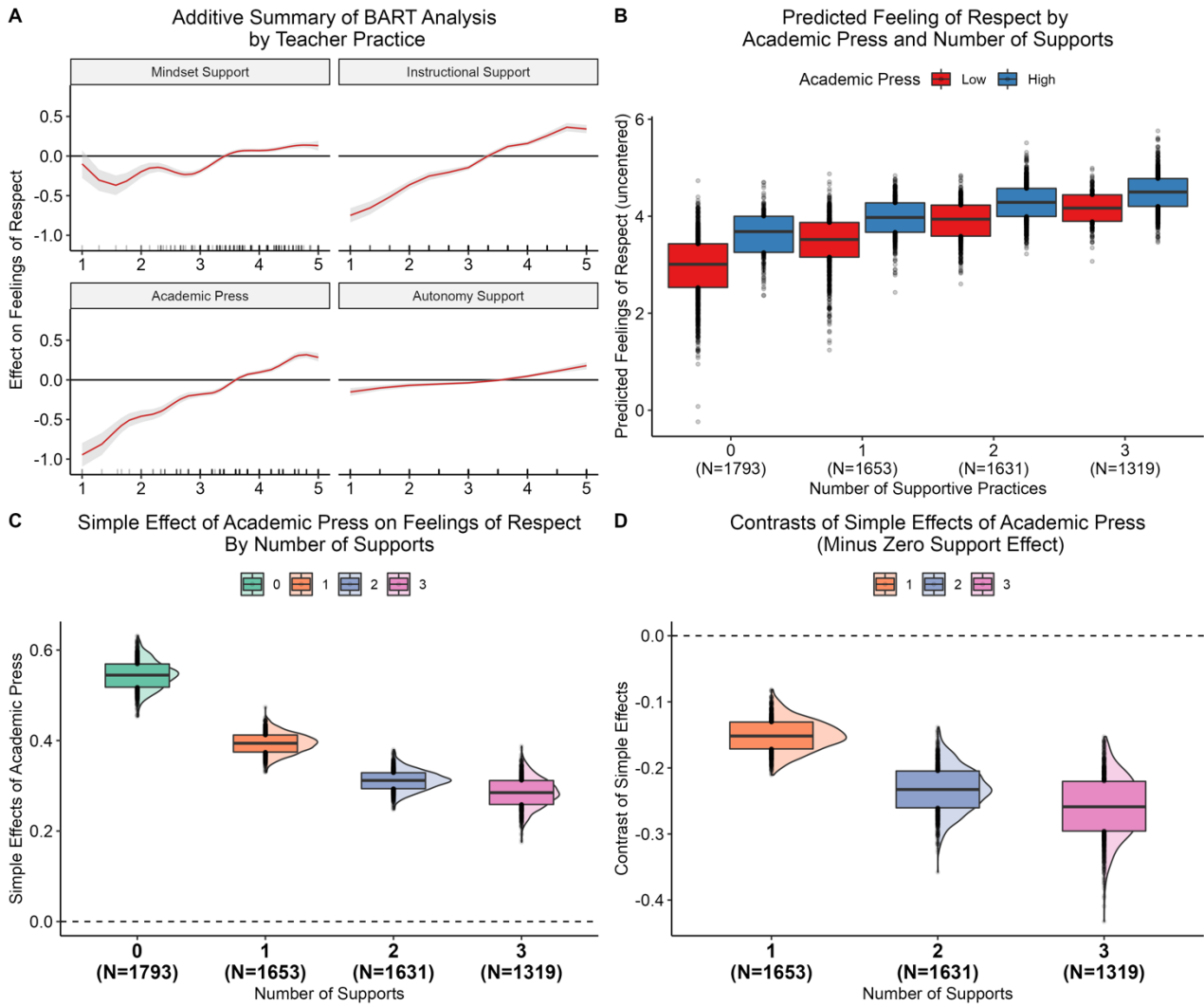
Figure 4. Posterior Distributions from BART Model Predicting Feelings of Respect with Student Reports of Teacher Practices

Note: Panel A: Additive summary of the posterior distribution of each category of teacher practices, demonstrating positive effects on predicted feelings of respect for each. Panel B: Boxplot of the posterior distribution of predicted value of student's feelings of respect by number of supportive teacher practices and academic press. Panel C: Boxplot of the difference posterior distributions of High vs Low Academic press by number of supports. Panel D: Contrasts of posterior distribution of the simple effect of academic press comparing one, two, and three supports with zero supports.

# of Supports		Press Level	*Mean* (*SD*)	10th – 90th Range
	0	High	2.951 (0.57)	1.890 - 3.761
	0	Low	3.63 (0.43)	2.842 - 4.243
	1	High	3.472 (0.48)	2.569 - 4.151
	1	Low	3.969 (0.36)	3.390 - 4.513
	2	High	3.907 (0.36)	3.247 - 4.449
	2	Low	4.285 (0.34)	3.715 - 4.835
	3	High	4.170 (0.30)	3.735 - 4.695
	3	Low	4.494 (0.34)	3.933 - 5.008

Table 14. Predicted Level of Respect by Press and Support Level

# of Supports		*M* (*SD*)	% Above Zero	10th – 90th Range
	0	0.544 (0.03)	~100%	0.519 - 0.568
	1	0.391 (0.02)	~100%	0.373 - 0.409
	2	0.308 (0.02)	~100%	0.291 - 0.327
	3	0.286 (0.03)	~100%	0.259 - 0.313
Difference Compared to Zero Support				
	1	0.153 (0.02)	~100%	0.133 - 0.172
	2	0.236 (0.03)	~100%	0.209 - 0.264
	3	0.258 (0.05)	~100%	0.220 – 0.297

Table 15. Difference In Posterior Means of Press Level by Number of Supports

DISCUSSION

In this study we replicated the framework derived in Study 2 in a large nationally representative sample of classrooms. Using student reports of teacher behavior, we found that the high levels of academic press and supports successfully predicted students' feelings of respect from their math teacher. Using a BART model, each category of teacher practices was related to students' feelings of respect (Academic Press, Mindset Support, Instructional Support, and Autonomy Support). Moreover, examining the posterior distribution from the BART model I found that there were additive and interactive effects of having academic press and support. Having more of either academic press or greater numbers of support related to higher feelings of respect (Figure 4: Panel B). The effect of having academic press present related to higher respect when supports were *lower*, which suggest the impact of having either component of respect related to measurable differences in student ratings. This finding suggests that the greatest changes in feelings of respect relate to having no respectful practices to having a few with diminishing differences occurring when more are added.

Chapter 5. General Discussion

OVERVIEW OF FINDINGS

In this dissertation, I showed that students' relative feelings of respect within their classrooms moderated the effect of an otherwise effective intervention (Study 1), that students' descriptions that mention teachers who offered support and held them to a high standard were rated as more respectful (Study 2), and students who reported their teachers as having high standards and supportive teacher practices felt more respected (Study 3). Study 1 specifically demonstrated that students who felt more respected in their classrooms show greater treatment effects from a growth mindset intervention in terms of both longitudinal (their math grades) and proximal (challenge seeking behavior and fixed mindset beliefs) outcomes. These results were found using a cutting-edge machine learning technique (Bayesian Causal Forest) designed to test for heterogeneity of treatment effects. Study 2 applied two different qualitative coding frameworks to students' own descriptions of respect, then used machine learning (BART) to predict student self-reported level of respect and national language processing (NLP) scores of respect and positive sentiment based on those codes. When those codes were grouped into categories of academic press and support, descriptions that included high academic press and a higher support had the highest predicted levels of respect. Study 3 applied those categories to student reported teacher practices using a large representative dataset and found that high academic press and support related to higher feelings of respect. This effect on respect was both additive (the greater presence of either category related to higher respect) and interactive (the impact of having academic press was greatest when there were fewer supports in place).

CONTRIBUTIONS TO THE LITERATURE

Looking across the studies, this dissertation made several contributions to the literature on adolescent development. First, it identified an important moderator of adolescent intervention effects: feelings of respect. At a theoretical level, this provided further evidence to the status and respect sensitivity hypothesis (Yeager et al., 2018), and therefore this dissertation is an advance toward a more integrative, multi-disciplinary perspective on adolescent behavior change. This is important because a major area of focus in the social and behavioral sciences currently is to develop models of behavior change (and health promotion) that lead to real-world impact (see Dahl et al. 2018; Nielson et al 2018). This is especially relevant as efforts to intervene during middle to late adolescence often fall short of expectations, and maladaptive behaviors emerge during this time. Crafting more respectful environments for adolescents may lead to more impactful interventions during a particularly sensitive period of development.

Second, given that the items used to measure respect were short and easy to administer, future experimental research could use our short scale to understand heterogeneous effects of adolescent interventions. This is important because there have been a growing number of calls for research that uncovers sources of heterogeneous effects, to design better and more reliable social programs and behavioral interventions (see Bolger et al. 2019; Tipton et al. 2019). If more investigators used the items validated in Study 1, then it could lead to a more systematic and comprehensive literature on the topic of when, and under what conditions, a behavioral intervention will have effects.

Third, this dissertation linked together very different literatures to produce a simplified framework for how to promote a feeling of respect among adolescents. By drawing on SDT and procedural justice theory and using the warm demander framework as an organizing heuristic, we were able to both identify two simple dimensions (press and

support) and more granular practices with them that could inform teachers' actions in the future. This is the start of an integration across areas of psychology to develop a more holistic approach to motivating adolescent behavior change. Moreover, research into respect often have disparate theoretical frameworks, and few have attempted to integrate the various work surrounding this concept (see Rothers & Cohrs, 2022; Blader & Yu, 2017). This dissertation offers a simplifying framework for studying respect.

Fourth, this dissertation demonstrated a mixed methods approach to exploring an ambiguous concept using the voice and perspectives of the target population. Specifically, Study 2 combined qualitative coding, natural language processing, and quantitative machine learning analyses on open ended student responses to uncover a heuristic framework of respect. Presumably this method could be used to investigate other contexts in which respect would be relevant for guiding behavior (risky driving, medication compliance, etc.).

Fifth and finally, this dissertation proposes a simple framework for identifying and, by extension, creating more respectful environments for adolescents. This framework should be especially useful for teachers and other practitioners who work with adolescents, as it offers relatively straightforward guidance on how to craft a respectful environment. Though, this will need to be tested more extensively and likely needs to be carefully attuned to specific contexts.

LIMITATIONS

This dissertation had several limitations that temper my findings. Foremost is that all three studies were correlational in nature. Study 1 examined data from a randomized intervention, but the focal moderator of respect was measured and not manipulated. Study 2 also found relationships between our framework of academic press and supports to higher

levels of respect but did not experimentally manipulate the pretense of either. Study 3 also looked at the reports of certain teacher practices and how they related to feelings of respect but did not experimentally manipulate the practices teachers used. This means that no causal claims can be made about the impact or structure of respect in the classroom at this time.

Second, studies 2 and 3 are limited because they only examined student's descriptions of teacher practices and did not account for their teachers' perceptions. Teachers and students are likely to differ in their perceptions of classroom practices. Moreover, teachers may intend to engage in a particular practice, but it is not necessarily perceived by students. This limitation is especially relevant when translating this research in practical guidance for teachers as teachers may intend to engage in high academic press and support yet have students who do not perceive it as such.

Third, given that students descriptions of what they found to be respectful varied substantially, these results may not generalize to other populations and settings (i.e., beyond American 8th -10th grade students). It may be the case that students in different contexts use different frameworks for detecting whether they are being respected or not. Such a possibility suggests the need to carefully attune to the specific settings and populations of interests, and to more extensively test the framework found in this dissertation in different contexts, cultures, and settings.

FUTURE DIRECTIONS

With those limitations in mind, this dissertation sets the stage for several lines of future work. First, and foremost, this framework of eliciting feelings of respect from students should be experimentally tested. Academic press and support could be manipulated, and consequent respect measured; this would test whether the combination

of these two elements elicit respect and if just having one element is enough to lead to respect. This respect manipulation could also be crossed with a mindset intervention to causally test the moderating impact of respect as well as whether respectful interactions lead to positive student mindsets. A teacher communicating they believe students are able to reach a high standard and have their support may lead to students thinking more positively of their competencies and ability to improve.

Second, one way to interpret the overarching finding of these studies is that disrespected students are driving the effects. Students who feel disrespected by teachers and adults are shut off from attempts to shift their beliefs or behaviors while reporting little support or encouragement from their teacher, an experience that is not necessarily shared by their peers in the same context. What exactly is happening among these students? What is leading to these different perceptions even when students share the same teacher? A closer examination of these students that consider their perspectives and individual traits is warranted.

Third, further research is needed to design training programs and tools for educators shifting to more respectful practices. This line of work needs several components: 1) listening to teachers about their teaching practices and beliefs about students, 2) experimentally testing belief and behavior change approaches with teachers, and 3) testing the impact of changing practices on student perceptions and behavior. The first component could take the form of focus groups, surveys, and collaboration with teachers to identify the respectful practices teachers are already engaged in as well as the barriers teachers likely face in implementing these practices. The second component relates to a burgeoning field of work focused on testing teacher training approaches in a practical, contextually sensitive manner that acknowledges the realities teachers face (Bryan et al., 2021; Hecht

et al., 2023). The third component is critical in ensuring that the changes teachers are hoping to make have impact on students in the intended manner.

The first step to working in this new context would be to interview and work with teachers to identify how respectful practices and beliefs. The second would be to assess what values and beliefs current teachers hold by administering a representative survey. Both the qualitative and quantitative explorations could be used to design/refine measures of teacher beliefs and practices and to design a teacher training module aimed at shifting those beliefs and practices. Last the impact of training could be assessed among both teachers and their students through observational and administrative data. One context where this could be urgent is in the developing world and the global south, as students face greater barriers to success and the impact of teacher practices often have only been explored in western contexts.

Last, the question of how race, social class, gender, or other identity grouping influences the effect of respect is still open. Several theories on stereotyping and discrimination (e.g. see Cohen et al., 2012; Crocker et al., 1991; Croizet et al., 2001; Jussim et al., 1996) would predict that individuals of marginalized groups would receive less respect than their peers. Indeed, we find such an effect for SES and gender in our sample, whereby women and low SES students reported lower feelings of respect, though not for race but that may be due to how we define race in our study. Moreover, low prior achievement was also related to feeling less respected suggesting the possibility of a recursive cycle where low achieving students feel disrespected and disengage from class work which leads to less respect from teachers. Additionally, success and achievement could be recognized by teacher differently depending on group membership (e.g. boys could be praised more openly than girls). It is likely that respect, group membership, and other factors interact in complex and context-dependent ways.

89

In Study 1, I examined whether the respect moderation of math GPA varied by underrepresented racial minority status, gender, and SES, but did not find any differences (see Supplement Section 4). This is somewhat surprising given students from some identity groups (female and low SES students) in this study report feeling less respected; a reasonable hypothesis is that students who are typically subjected to disrespect might prosper when they feel respected. On the other hand, perhaps the lack of moderation by identity group suggests a universal effect of respect whereby adolescents largely react similarly to being respected and disrespected. Yet another possibility is that respect relates more to intersectional identities (e.g., low SES girls, underrepresented minority boys, etc.; for an example see Carroll et al., 2023) or local identity groups (i.e., how others like you are treated in your environment; for an example see Walton et al. 2023). Regardless, this is a fruitful topic for future research.

CONCLUSION

Overall, this dissertation is an important step in the investigation of how respect plays a crucial role in adolescent life, and how it may be harnessed to improve those lives. I demonstrated that respect can be a powerful tool for educators and is likely useful for others who work with adolescents. Respect is a rich concept that has many interacting theocratical underpinnings and practical applications. My hope is that this dissertation serves a steppingstone for further investigation into the concept of respect and offers a promising framework for practitioners to begin cultivating more respectful environments in which adolescents can thrive.

Supplement

STUDY 1

Section 1: Analysis Using only Pre-Intervention Item
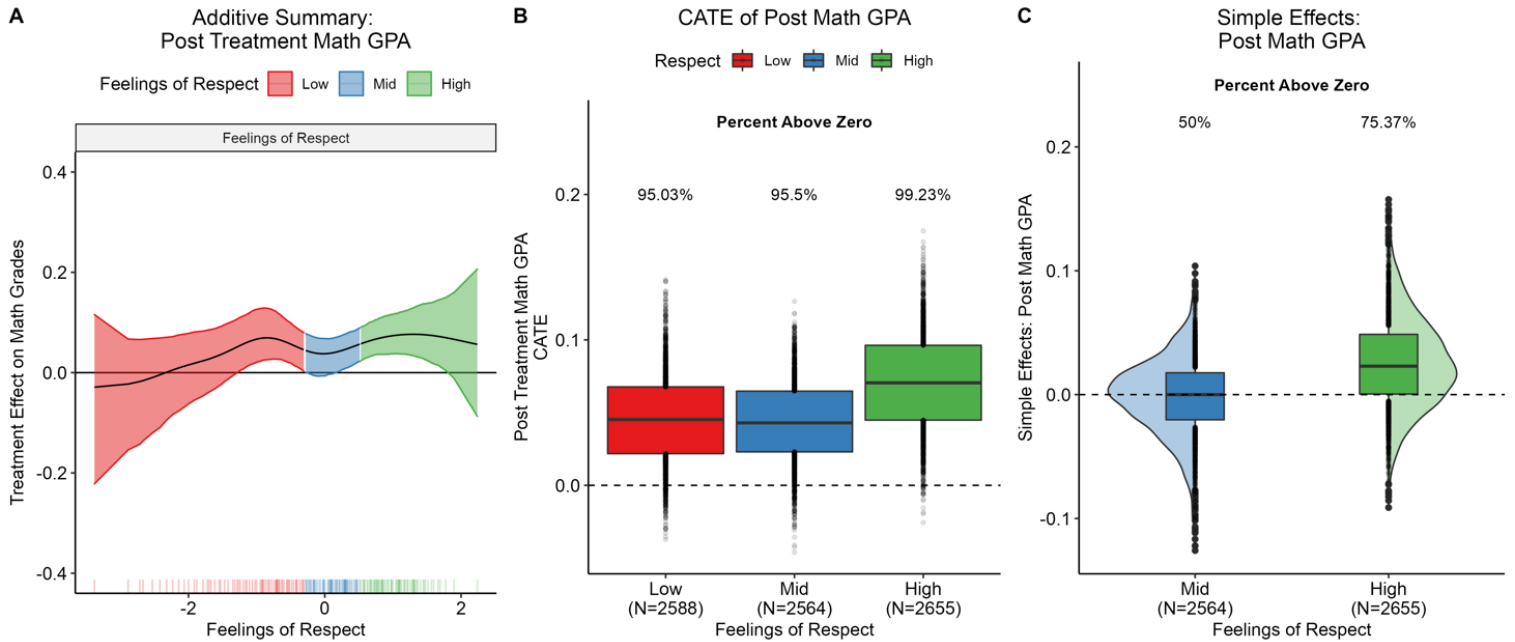
Figure 5: Results of BCF Analysis of Only Baseline Respect Item

Note: This figure corresponds to panels A-C in Figure 2 from Study 1, showing similar findings using the single item of respect measured before the intervention materials. Panel A: Additive summary of the posterior distribution of CATEs on post math GPA by level of pre-intervention respect. Panel B: Boxplot of each level of pre-intervention respect's posterior distribution of CATEs for post math GPA. Panel C: Boxplot of the difference posterior distributions of the Mid and High groups compared to the Low groups of pre-intervention respect.

	Math GPA			**Challenge Worksheet**			**Fixed Mindset**		
Predictors	b	CI	p	b	CI	p	b	CI	p
(Intercept)	0.56	0.43 – 0.69	**<0.001**	-3.53	-4.08 – -2.98	**<0.001**	3.63	3.46 – 3.80	**<0.001**
Condition	0.06	0.03 – 0.09	**0.001**	0.95	0.80 – 1.11	**<0.001**	-0.41	-0.46 – -0.37	**<0.001**
Feelings of Respect (Baseline Only)	0.02	0.00 – 0.05	**0.045**	0.08	-0.03 – 0.18	0.160	-0.03	-0.07 – -0.00	**0.036**
Pre Math-GPA	0.43	0.41 – 0.46	**<0.001**	-0.05	-0.15 – 0.06	0.352	-0.04	-0.08 – 0.01	**0.007**
Pre Math-GPA Dummy	0.00	-0.06 – 0.06	0.098	-0.10	-0.34 – 0.14	0.407	-0.01	-0.09 – 0.06	0.733
Math Expectations	0.20	0.18 – 0.22	**<0.001**	0.56	0.49 – 0.64	**<0.001**	-0.14	-0.17 – -0.12	**<0.001**
Math Expectations Dummy	-0.07	-0.57 – 0.43	0.783	-0.06	-2.23 – 2.11	0.957	0.69	0.02 – 1.35	**0.043**
Minority Status	-0.16	-0.20 – -0.12	**<0.001**	0.29	0.12 – 0.46	**0.001**	0.08	0.03 – 0.14	**0.002**
Gender	0.22	0.18 – 0.25	**<0.001**	-0.42	-0.58 – -0.26	**<0.001**	-0.01	-0.05 – 0.04	0.805
Low SES	-0.15	-0.19 – -0.11	**<0.001**	-0.24	-0.41 – -0.06	**0.007**	0.06	0.01 – 0.12	**0.016**
Low Achiever	-0.50	-0.55 – -0.46	**<0.001**	-0.24	-0.44 – -0.04	**0.018**	0.11	0.05 – 0.17	**<0.001**
Condition x Respect	0.03	-0.01 – 0.06	0.131	0.18	0.03 – 0.33	**0.021**	-0.05	-0.09 – 0.00	**0.040**
Random Effects									
σ^2		0.68			13.21			1.24	
τ_{00}		0.14			0.49			0.07	
ICC		0.17			0.04			0.05	
K (math teachers)		379			373			377	
N (students)		9028			8654			8864	
Marginal R^2 / Conditional R^2		0.400 / 0.534			0.057 / 0.091			0.075 / 0.123	

Table 16: Model Output Examining Only Baseline Respect Item

Section 2: Traditional Linear Model of Respect Interaction

Predictors	Math GPA			Challenge Worksheet			Fixed Mindset		
	b	CI	p	*b*	CI	p	*b*	CI	p
(Intercept)	0.59	0.46 –0.73	**<0.001**	-3.43	-3.98 – -2.88	**<0.001**	3.57	3.40 – 3.74	**<0.001**
Condition	0.06	0.02 – 0.09	**0.001**	0.95	0.80 – 1.10	**<0.001**	-0.41	-0.46 – -0.37	**<0.001**
Feelings of Respect	0.06	0.03 – 0.09	**<0.001**	0.20	0.06 – 0.34	**0.007**	-0.09	-0.13 – -0.05	**<0.001**
Pre Math-GPA	0.43	0.41 – 0.46	**<0.001**	-0.05	-0.15 – 0.06	0.360	-0.04	-0.07 – 0.01	**0.011**
Pre Math-GPA Dummy	0.00	-0.06 – 0.06	0.981	-0.14	-0.36 – 0.11	0.297	-0.01	-0.08 – 0.06	0.779
Math Expectations	0.20	0.18 – 0.21	**<0.001**	0.54	0.47 – 0.62	**<0.001**	-0.13	-0.16 – -0.11	**<0.001**
Math Expectations Dummy	-0.15	-0.63 – 0.32	0.531	0.00	-2.08 – 2.08	0.999	0.69	0.05 – 1.32	**0.034**
Minority Status	-0.16	-0.20 – -0.12	**<0.001**	0.29	0.12 – 0.46	**0.001**	0.08	0.03 – 0.14	**0.002**
Gender	0.22	0.18 – 0.25	**<0.001**	-0.44	-0.59 – -0.28	**<0.001**	0.00	-0.05 – 0.05	0.944
Low SES	-0.15	-0.19 – -0.11	**<0.001**	-0.24	-0.42 – -0.08	**0.004**	0.07	0.02 – 0.12	**0.008**
Low Achiever	-0.50	-0.54 – -0.45	**<0.001**	-0.23	-0.43 – -0.03	**0.024**	0.10	0.04 – 0.16	**<0.001**
Condition x Respect	0.05	0.01 – 0.10	**0.017**	0.24	0.04 – 0.45	**0.018**	-0.11	-0.17 – -0.05	**0.001**
Random Effects									
σ^2	0.68			13.17			1.22		
τ_{00}	0.14			0.49			0.07		
ICC	0.17			0.04			0.05		
K (math teachers)	379			373			377		
N (students)	9076			8702			8912		
Marginal R^2 / Conditional R^2	0.440 / 0.535			0.059 / 0.093			0.080 / 0.130		

Table 17: Model Output Using Traditional Mixed Effect Regression

Section 3: Within vs Between Classroom Respect Linear Multilevel Model

Predictors	Main Model with Teacher Centered Respect			Uncentered Respect			Teacher Mean Included		
	b	CI	*p*	*b*	CI	*p*	*b*	CI	*p*
(Intercept)	0.59	0.46 – 0.73	**<0.001**	0.34	0.18 – 0.51	**<0.001**	-0.32	-0.87 – 0.22	0.246
Condition	0.06	0.02 – 0.09	**0.001**	-0.1	-0.26 – 0.06	0.214	0.23	-0.21 – 0.68	0.304
Pre Math-GPA	0.43	0.41 – 0.46	**<0.001**	0.43	0.41 – 0.46	**<0.001**	0.43	0.41 – 0.46	**<0.001**
Pre Math-GPA Dummy	0.00	-0.06 – 0.06	0.981	0.00	-0.06 – 0.06	0.984	0.00	-0.06 – 0.06	0.936
Math Expectations	0.2	0.18 – 0.21	**<0.001**	0.19	0.18 – 0.21	**<0.001**	0.19	0.18 – 0.21	**<0.001**
Math Expectations Dummy	-0.15	-0.63 – 0.32	0.531	-0.15	-0.63 – 0.32	0.532	-0.15	-0.63 – 0.32	0.531
Minority Status	-0.16	-0.20 – -0.12	**<0.001**	-0.16	-0.20 – -0.12	**<0.001**	-0.16	-0.20 – -0.12	**<0.001**
Gender	0.22	0.18 – 0.25	**<0.001**	0.22	0.18 – 0.25	**<0.001**	0.22	0.18 – 0.25	**<0.001**
Low SES	-0.15	-0.19 – -0.11	**<0.001**	-0.15	-0.19 – -0.11	**<0.001**	-0.15	-0.19 – -0.11	**<0.001**
Low Achiever	-0.5	-0.54 – -0.45	**<0.001**	-0.5	-0.54 – -0.45	**<0.001**	-0.5	-0.54 – -0.45	**<0.001**
Teacher Centered Respect	0.06	0.03 – 0.09	**<0.001**				0.06	0.03 – 0.09	**<0.001**
Treatment x Teacher Centered Respect	0.05	0.01 – 0.10	**0.017**				0.05	0.01 – 0.10	**0.017**
Uncentered Respect				0.07	0.04 – 0.10	**<0.001**			
Treatment X Uncentered Respect				0.04	0.00 – 0.08	**0.048**			
Mean of Teacher Respect							0.25	0.10 – 0.39	**0.001**
Treatment X Teacher Mean Respect							-0.05	-0.17 – 0.07	0.433

Random Effects			
σ^2	0.68	0.68	0.68
τ_{00}	0.14	0.14	0.14
ICC	0.17	0.17	0.17
K (Teachers)	379	379	379
N	9076	9076	9076
Marginal R^2 / Conditional R^2	0.401 / 0.539	0.404 / 0.538	0.411 / 0.541

Table 18: Model Comparison of Teacher Center Respect, Uncentered Respect, and
Teacher Mean Respect Treatment Interactions

Section 4: Respect Moderation by Underrepresented Racial Minority Status, Gender, and SES
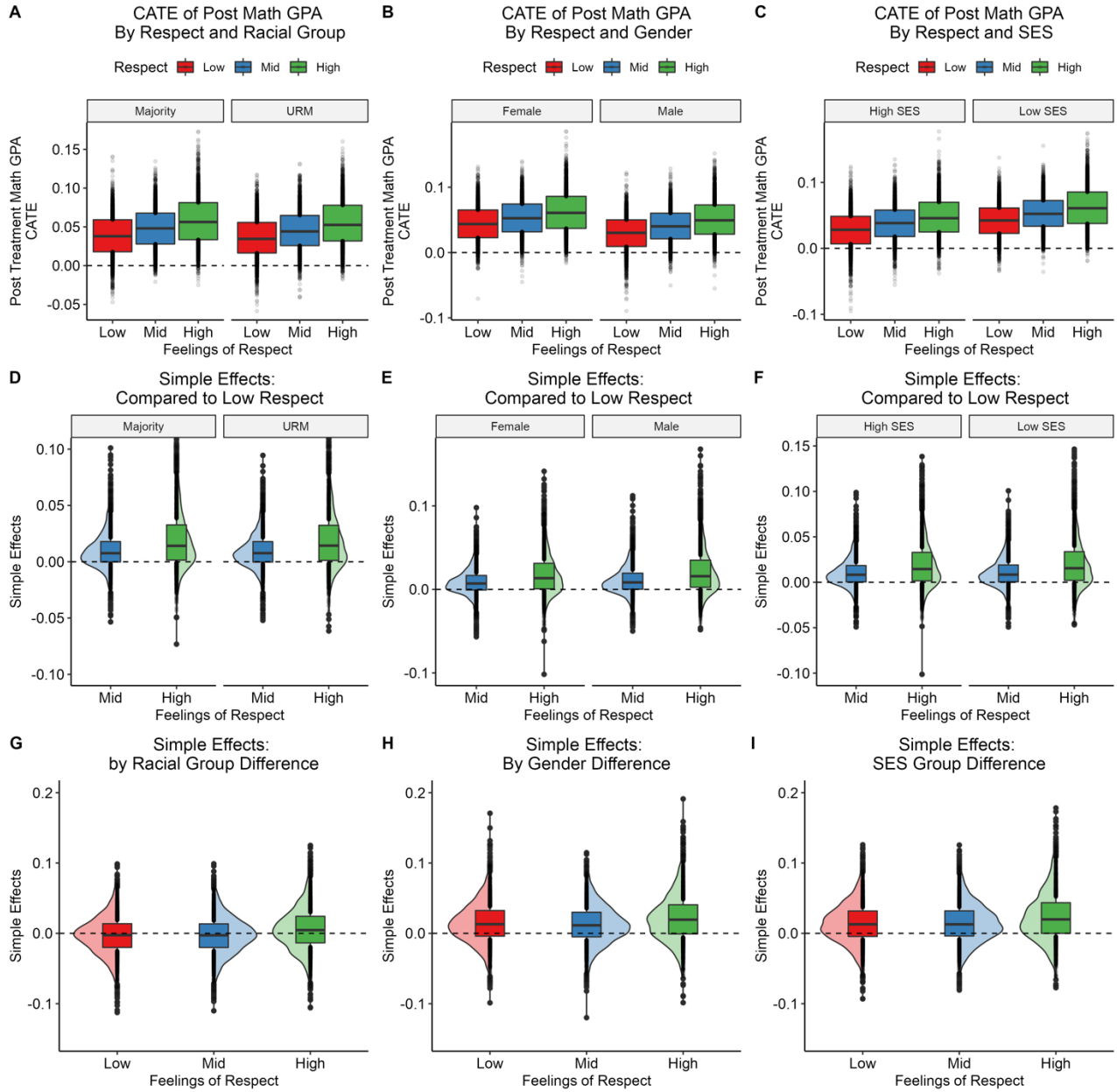
Math GPA

Figure 6: BCF Results of Respect Moderation on Math GPA Treatment Effects by Identity Group

Note: This figure corresponds to panels B-C in Figure 2 from Study 1, showing differences in treatment effect by both feelings of respect and identity group. Panel A-B: Boxplot of posterior distribution of CATEs for post math GPA by each level of pre-intervention respect by A: underrepresented racial minority status, B: gender, and C: SES. Panel D-F: Boxplot of the difference posterior distributions of the Mid and High respect groups compared to the Low groups of pre-intervention respect by D: underrepresented racial minority status, E: gender, and F: SES, demonstrating a lack of interaction of level of respect by identity group on treatment effects. Panel G-I: Boxplot of the difference posterior of G: underrepresented racial minority status, H: gender, and I: SES by level of respect (similar to Panels D-F but comparing differences in identity group by respect level) also demonstrating a lack of an interaction of level of respect by identity group.

Respect Group	Subgroup	*M* (*SD*)	% Above Zero	10th – 90th Range
Low	URM	0.036 (0.02)	93.87%	0.016 - 0.056
Mid	URM	0.045 (0.02)	97.77%	0.026 - 0.065
High	URM	0.055 (0.03)	98.67%	0.032 - 0.078
Low	Majority	0.038 (0.02)	94%	0.018 - 0.059
Mid	Majority	0.048 (0.02)	98.33%	0.028 - 0.068
High	Majority	0.058 (0.03)	99.03%	0.033 - 0.081
Low	Female	0.044 (0.03)	96.70%	0.023 - 0.065
Mid	Female	0.053 (0.02)	98.93%	0.032 - 0.074
High	Female	0.062 (0.03)	99.27%	0.037 - 0.086
Low	Male	0.029 (0.02)	88.80%	0.009 - 0.05
Mid	Male	0.040 (0.02)	96.60%	0.021 - 0.06
High	Male	0.051 (0.03)	98.37%	0.028 - 0.073
Low	Low SES	0.042 (0.02)	96.40%	0.023 - 0.061
Mid	Low SES	0.053 (0.02)	99.10%	0.034 - 0.073
High	Low SES	0.062 (0.03)	99.40%	0.038 - 0.085
Low	High SES	0.028 (0.03)	87.40%	0.007 - 0.049
Mid	High SES	0.038 (0.02)	94.97%	0.018 - 0.058
High	High SES	0.047 (0.03)	97.07%	0.025 - 0.07

Table 19: Summary of the Posterior Distribution of CATEs for Math GPA by Respect
        Level and Identity Subgroup

References

Adolphs, R. (2009). The social brain: Neural basis of social knowledge. *Annual Review of Psychology*, *60*, 693–716.

    https://doi.org/10.1146/annurev.psych.60.110707.163514

Ainley, M. (2006). Connecting with learning: Motivation, affect and cognition in interest processes. *Educational Psychology Review*, *18*(4), 391–405.

    https://doi.org/10.1007/s10648-006-9033-0

Anderson, C., Hildreth, J. A. D., & Howland, L. (2015). Is the desire for status a fundamental human motive? A review of the empirical literature. *Psychological Bulletin*, *141*(3), 574–601. https://doi.org/10.1037/a0038781

Aronson, J. M., Fried, C. B., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, *38*(2), 113–125.

    https://doi.org/10.1006/jesp.2001.1491

Bailey, D., Duncan, G. J., Odgers, C. L., & Yu, W. (2017). Persistence and fadeout in the impacts of child and adolescent interventions. *Journal of Research on Educational Effectiveness*, *10*(1), 7–39.

    https://doi.org/10.1080/19345747.2016.1232459

Baumrind, D. (1968). Authoritarian vs. Authoritative Parental Control. *Adolescence*, *3*(11), 255–272.

Baumrind, D. (2013). Authoritative parenting revisited: History and current status. In *Authoritative parenting: Synthesizing nurturance and discipline for optimal child*

development (pp. 11–34). American Psychological Association.

https://doi.org/10.1037/13948-002

Blakemore, S.-J., Burnett, S., & Dahl, R. E. (2010). The role of puberty in the developing

adolescent brain. *Human Brain Mapping*, *31*(6), 926–933.

https://doi.org/10.1002/hbm.21052

Blakemore, S.-J., & Mills, K. L. (2014). Is adolescence a sensitive period for

sociocultural processing? *Annual Review of Psychology*, *65*, 187–207.

https://doi.org/10.1146/annurev-psych-010213-115202

Blau, P. M. (1986). *Exchange and power in social life*. Transaction Books.

Bolger, N., Zee, K. S., Rossignac-Milon, M., & Hassin, R. R. (2019). Causal processes in

psychology are heterogeneous. *Journal of Experimental Psychology: General*,

148(4), 601–618. https://doi.org/10.1037/xge0000558

Bos, P. A., Panksepp, J., Bluthé, R.-M., & van Honk, J. (2012). Acute effects of steroid

hormones and neuropeptides on human social–emotional behavior: A review of

single administration studies. *Frontiers in Neuroendocrinology*, *33*(1), 17–35.

https://doi.org/10.1016/j.yfrne.2011.01.002

Braams, B. R., van Duijvenvoorde, A. C. K., Peper, J. S., & Crone, E. A. (2015).

Longitudinal changes in adolescent risk-taking: A comprehensive study of neural

responses to rewards, pubertal development, and risk-taking behavior. *Journal of*

Neuroscience, *35*(18), 7226–7238. https://doi.org/10.1523/JNEUROSCI.4764-

14.2015

Bracy, N. L. (2010). Circumventing the Law: Students' Rights in Schools With Police.

    Journal of Contemporary Criminal Justice, *26*(3), 294–315.

    https://doi.org/10.1177/1043986210368645

Bracy, N. L. (2011). Student Perceptions of High-Security School Environments. *Youth*

    & Society, *43*(1), 365–395. https://doi.org/10.1177/0044118X10365082

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development.

    American Psychologist, *32*(7), 513–531. https://doi.org/10.1037/0003-

    066X.32.7.513

Brown, C. S., & Bigler, R. S. (2005). Children's perceptions of discrimination: A

    developmental model. *Child Development*, *76*(3), 533–553.

    https://doi.org/10.1111/j.1467-8624.2005.00862.x

Bryan, C., Hecht, C., Blazar, D., Kraft, M., & Solheim, O. (2021). *Global Mindset*

    Initiative Working Paper 2: Designing an Intervention to Motivate Growth

    Mindset-Supportive Teaching Practices (SSRN Scholarly Paper 3911995).

    https://doi.org/10.2139/ssrn.3911995

Bryan, C. J., Tipton, E., & Yeager, D. S. (2021). Behavioural science is unlikely to

    change the world without a heterogeneity revolution. *Nature Human Behaviour*,

    5(8), 980–989. https://doi.org/10.1038/s41562-021-01143-3

Bryk, A. S., & Schneider, B. (2002). *Trust in schools: A core resource for improvement*.

    Russell Sage Foundation.

Burnett, S., Bird, G., Moll, J., Frith, C., & Blakemore, S.-J. (2009). Development during adolescence of the neural processing of social emotion. *Journal of Cognitive Neuroscience*, *21*(9), 1736–1750. https://doi.org/10.1162/jocn.2009.21121

Byun, S., Irvin, M. J., & Bell, B. A. (2015). Advanced Math Course Taking: Effects on Math Achievement and College Enrollment. *Journal of Experimental Education*, *83*(4), 439–468. https://doi.org/10.1080/00220973.2014.919570

Carroll, J. M., Yeager, D. S., Buontempo, J., Hecht, C., Cimpian, A., Mhatre, P., Muller, C., & Crosnoe, R. (2023). Mindset × Context: Schools, Classrooms, and the Unequal Translation of Expectations into Math Achievement. *Monographs of the Society for Research in Child Development*, *88*(2), 7–109. https://doi.org/10.1111/mono.12471

Cohen, G. L., Purdie-Vaughns, V., & Garcia, J. (2012). An identity threat perspective on intervention. In M. Inzlicht & T. Schmader (Eds.), *Stereotype threat: Theory, process, and application* (pp. 280–296). Oxford University Press.

Cohen, G. L., & Steele, C. M. (2002). A barrier of mistrust: How negative stereotypes affect cross-race mentoring. In J. M. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 303–327). Emerald Group Publishing.

Cohen, G. L., Steele, C. M., & Ross, L. D. (1999). The mentor's dilemma: Providing critical feedback across the racial divide. *Personality and Social Psychology Bulletin*, *25*(10), 1302–1318. https://doi.org/10.1177/0146167299258011

Corpus, J. H., McClintic-Gilbert, M. S., & Hayenga, A. O. (2009). Within-year changes in children's intrinsic and extrinsic motivational orientations: Contextual predictors and academic outcomes. *Contemporary Educational Psychology*, *34*, 154–166. https://doi.org/10.1016/j.cedpsych.2009.01.001

Crocker, J., Voelkl, K., Testa, M., & Major, B. (1991). Social stigma: The affective consequences of attributional ambiguity. *Journal of Personality and Social Psychology*, *60*(2), 218–228. https://doi.org/10.1016/b978-0-08-088579-7.50019-3

Croizet, J.-C., Désert, M., Dutrévis, M., & Leyens, J.-P. (2001). Stereotype Threat, Social Class, Gender, and Academic Under-Achievement: When Our Reputation Catches Up to Us and Takes Over. *Social Psychology of Education*, *4*(3), 295–310. https://doi.org/10.1023/A:1011336821053

Crone, E. A., & Dahl, R. E. (2012). Understanding adolescence as a period of social-affective engagement and goal flexibility. *Nature Reviews Neuroscience*, *13*, 636–650. https://doi.org/10.1038/nrn3313

Crosnoe, R. (2011). *Fitting in, standing out: Navigating the social challenges of high school to get an education*. Cambridge University Press.

Dahl, R. E., Allen, N. B., Wilbrecht, L., & Suleiman, A. B. (2018). Importance of investing in adolescence from a developmental science perspective. *Nature*, *554*(7693), 441–450. https://doi.org/10.1038/nature25770

De Cremer, D., & Tyler, T. R. (2007). The effects of trust in authority and procedural

fairness on cooperation. *Journal of Applied Psychology*, *92*(3), 639–649.

https://doi.org/10.1037/0021-9010.92.3.639

De Lorme, K. C., & Sisk, C. L. (2013). Pubertal testosterone programs context-

appropriate agonistic behavior and associated neural activation patterns in male

Syrian hamsters. *Physiology & Behavior*, *112–113*, 1–7.

https://doi.org/10.1016/j.physbeh.2013.02.003

Dornbusch, S. M. (1989). The Sociology of Adolescence. *Annual Review of Sociology*,

15(1), 233–259. https://doi.org/10.1146/annurev.so.15.080189.001313

Downey, D. B., Ainsworth, J. W., & Qian, Z. (2009). Rethinking the Attitude-

Achievement Paradox Among Blacks. *Sociology of Education*, *82*(1), 1–19.

https://doi.org/10.1177/003804070908200101

Dreher, J.-C., Dunne, S., Pazderska, A., Frodl, T., Nolan, J. J., & O'Doherty, J. P. (2016).

Testosterone causes both prosocial and antisocial status-enhancing behaviors in

human males. *Proceedings of the National Academy of Sciences*, *113*(41), 11633–

11638. https://doi.org/10.1073/pnas.1608085113

Dumontheil, I., Hillebrandt, H., Apperly, I. A., & Blakemore, S.-J. (2012).

Developmental Differences in the Control of Action Selection by Social

Information. *Journal of Cognitive Neuroscience*, *24*(10), 2080–2095.

https://doi.org/10.1162/jocn_a_00268

Dunning, D., Anderson, J. E., Schlösser, T., Ehlebracht, D., & Fetchenhauer, D. (2014).

Trust at zero acquaintance: More a matter of respect than expectation of reward.

Journal of Personality and Social Psychology, *107*(1), 122.

https://doi.org/10.1037/a0036673

Dweck, C. S., & Yeager, D. S. (2020). A growth mindset about intelligence. In G. M.
Walton & A. Crum, (Eds.), *Handbook of wise interventions: How social-psychological insights can help solve problems* (pp. 9–35). Guilford Press.

Elder Jr, G. H., & Shanahan, M. J. (2007). The life course and human development. In
Handbook of child psychology (Vol. 1). John Wiley & Sons, Inc. Hoboken, NJ,
USA.

Eriksson, T., Mao, L., & Villeval, M. C. (2017). Saving face and group identity.
Experimental Economics, *20*(3), 622–647. https://doi.org/10.1007/s10683-016-9502-3

Eskreis-Winkler, L., Shulman, E. P., Young, V., Tsukayama, E., Brunwasser, S. M., &
Duckworth, A. L. (2016). Using wise interventions to motivate deliberate
practice. *Journal of Personality and Social Psychology*, *111*(5), 728–744.
https://doi.org/10.1037/pspp0000074

Ferguson, R. F., & Danielson, C. (2015). How framework for teaching and Tripod 7Cs
evidence distinguish key components of effective teaching. In *Designing Teacher
Evaluation Systems* (pp. 98–143). John Wiley & Sons, Ltd.
https://doi.org/10.1002/9781119210856.ch4

Foulkes, L., & Blakemore, S.-J. (2016). Is there heightened sensitivity to social reward in
adolescence? *Current Opinion in Neurobiology*, *40*, 81–85.
https://doi.org/10.1016/j.conb.2016.06.016

Frith, C. D. (2007). The social brain? *Philosophical Transactions of the Royal Society B: Biological Sciences*, *362*(1480), 671–678. https://doi.org/10.1098/rstb.2006.2003

Fuligni, A. J. (2019). The Need to Contribute During Adolescence. *Perspectives on Psychological Science*, *14*(3), 331–343. https://doi.org/10.1177/1745691618805437

Galván, A. (2013). The teenage brain: Sensitivity to rewards. *Current Directions in Psychological Science*, *22*(2), 88–93. https://doi.org/10.1177/0963721413480859

Goddings, A., Burnett Heyes, S., Bird, G., Viner, R. M., & Blakemore, S. (2012). The relationship between puberty and social emotion processing. *Developmental Science*, *15*(6), 801–811. https://doi.org/10.1111/j.1467-7687.2012.01174.x

Goffman, E., & Best, J. (2017). *Interaction ritual: Essays in face-to-face behavior*. Routledge, Taylor and Francis Group.

Gottfredson, G. D., & Gottfredson, D. C. (2012). *Victimization in Schools*. Springer Science & Business Media.

Gottfredson, G. D., Gottfredson, D. C., Payne, A. A., & Gottfredson, N. C. (2005). School Climate Predictors of School Disorder: Results from a National Study of Delinquency Prevention in Schools. *Journal of Research in Crime and Delinquency*, *42*(4), 412–444. https://doi.org/10.1177/0022427804271931

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology*, *93*, 3–13. https://doi.org/10.1037/0022-0663.93.1.3

Granot, Y., & Tyler, T. R. (2019). Adolescent cognition and procedural justice:

      Broadening the impact of research findings on policy and practice. *Social and*

      Personality Psychology Compass, *13*(10), e12503.

      https://doi.org/10.1111/spc3.12503

Gregory, A., & Weinstein, R. S. (2004). Connection and regulation at home and in school

      predicting growth in achievement for adolescents. *Journal of Adolescent*

      Research, *19*(4), 405–427. https://doi.org/10.1177/0743558403258859

Gregory, A., & Weinstein, R. S. (2008). The discipline gap and African Americans:

      Defiance or cooperation in the high school classroom. *Journal of School*

      Psychology, *46*(4), 455–475. https://doi.org/10.1016/j.jsp.2007.09.001

Gunnar, M. R., Wewerka, S., Frenn, K., Long, J. D., & Griggs, C. (2009). Developmental

      changes in hypothalamus–pituitary–adrenal activity over the transition to

      adolescence: Normative changes and associations with puberty. *Development and*

      Psychopathology, *21*(1), 69. https://doi.org/10.1017/S0954579409000054

Harden, K. P., Kretsch, N., Mann, F. D., Herzhoff, K., Tackett, J. L., Steinberg, L., &

      Tucker-Drob, E. M. (2017). Beyond dual systems: A genetically-informed, latent

      factor model of behavioral and self-report measures related to adolescent risk-

      taking. *Developmental Cognitive Neuroscience*, *25*, 221–234.

      https://doi.org/10.1016/j.dcn.2016.12.007

Hecht, C. A., Murphy, M. C., Dweck, C. S., Bryan, C. J., Trzesniewski, K. H., Medrano,

      F. N., Giani, M., Mhatre, P., & Yeager, D. S. (2023). Shifting the mindset culture

to address global educational disparities. *Npj Science of Learning*, *8*(1), Article 1.

    https://doi.org/10.1038/s41539-023-00181-y

Hirsch, J. L., & Clark, M. S. (2019). Multiple Paths to Belonging That We Should Study

    Together. *Perspectives on Psychological Science*, *14*(2), 238–255.

    https://doi.org/10.1177/1745691618803629

Hughes, C., & Devine, R. T. (2015). Individual Differences in Theory of Mind From

    Preschool to Adolescence: Achievements and Directions. *Child Development*

    Perspectives, *9*(3), 149–153. https://doi.org/10.1111/cdep.12124

Huo, Y. J., Binning, K. R., & Molina, L. E. (2010). Testing an integrative model of

    respect: Implications for social engagement and well-being. *Personality and*

    Social Psychology Bulletin, *36*(2), 200–212.

    https://doi.org/10.1177/0146167209356787

Josephs, R. A., Sellers, J. G., Newman, M. L., & Mehta, P. H. (2006). The mismatch

    effect: When testosterone and status are at odds. *Journal of Personality and*

    Social Psychology, *90*(6), 999–1013.

Jussim, L., Eccles, J., & Madon, S. (1996). Social perception, social stereotypes, and

    teacher expectations: Accuracy and the quest for the powerful self-fulfilling

    prophecy. In *Advances in experimental social psychology, Vol. 28* (pp. 281–388).

    Academic Press.

Kupchik, A. (2016). *The Real School Safety Problem: The Long-Term Consequences of*

    Harsh School Punishment. Univ of California Press.

Leary, M. R., Jongman-Sereno, K. P., & Diebels, K. J. (2014). The Pursuit of Status: A

    Self-presentational Perspective on the Quest for Social Value. In *The Psychology*

    of Social Status (pp. 159–178). Springer, New York, NY.

    https://doi.org/10.1007/978-1-4939-0867-7_8

Maner, J. K., & Case, C. R. (2016). Dominance and prestige. In *Advances in*

    Experimental Social Psychology (Vol. 54, pp. 129–180). Elsevier.

    https://doi.org/10.1016/bs.aesp.2016.02.001

McFarland, D. A. (2001). Student Resistance: How the Formal and Informal

    Organization of Classrooms Facilitate Everyday Forms of Student Defiance.

    American Journal of Sociology, *107*(3), 612–678. https://doi.org/10.1086/338779

Meinhardt-Injac, B., Daum, M. M., & Meinhardt, G. (2020). Theory of mind

    development from adolescence to adulthood: Testing the two-component model.

    British Journal of Developmental Psychology, *38*(2), 289–303.

    https://doi.org/10.1111/bjdp.12320

Merkin, R. S. (2018). Individualism-Collectivism and Saving Face. In R. S. Merkin (Ed.),

    Saving Face in Business: Managing Cross-Cultural Interactions (pp. 81–117).

    Palgrave Macmillan US. https://doi.org/10.1057/978-1-137-59174-6_4

Miller, D. T. (2001). Disrespect and the experience of injustice. *Annual Review of*

    Psychology, *52*(1), 527–553. https://doi.org/10.1146/annurev.psych.52.1.527

Mills, K. L., Lalonde, F., Clasen, L. S., Giedd, J. N., & Blakemore, S.-J. (2014).

    Developmental changes in the structure of the social brain in late childhood and

adolescence. *Social Cognitive and Affective Neuroscience*, *9*(1), 123–131.

https://doi.org/10.1093/scan/nss113

Nagin, D. S., & Telep, C. W. (2017). Procedural Justice and Legal Compliance. *Annual Review of Law and Social Science*, *13*(1), 5–28. https://doi.org/10.1146/annurev-lawsocsci-110316-113310

Naiditch, F. (2018). Respect and Politeness in Different Cultures. In *The TESOL Encyclopedia of English Language Teaching* (pp. 1–6). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118784235.eelt0679

Peper, J. S., & Dahl, R. E. (2013). The teenage brain: Surging hormones—Brain-behavior interactions during puberty. *Current Directions in Psychological Science*, *22*(2), 134–139.

Preiss, D. R., Arum, R., Edelman, L. B., Morrill, C., & Tyson, K. (2016). The More You Talk, the Worse It Is: Student Perceptions of Law and Authority in Schools. *Social Currents*, *3*(3), 234–255. https://doi.org/10.1177/2329496515616813

Rege, M., Hanselman, P., Solli, I. F., Dweck, C. S., Ludvigsen, S., Bettinger, E., Crosnoe, R., Muller, C., Walton, G., & Duckworth, A. (2021). How can we inspire nations of learners? An investigation of growth mindset and challenge-seeking in two countries. *American Psychologist*, *76*(5), 755.

Robinson, D. L., Zitzman, D. L., Smith, K. J., & Spear, L. P. (2011). Fast dopamine release events in the nucleus accumbens of early adolescent rats. *Neuroscience*, *176*, 296–307. https://doi.org/10.1016/j.neuroscience.2010.12.016

Rothers, A., & Cohrs, J. C. (2022). What makes people feel respected? Toward an

    integrative psychology of social worth. *Psychological Review*.

    https://doi.org/10.1037/rev0000393

Rowe, R., Maughan, B., Worthman, C. M., Costello, E. J., & Angold, A. (2004).

    Testosterone, antisocial behavior, and social dominance in boys: Pubertal

    development and biosocial interaction. *Biological Psychiatry*, *55*(5), 546–552.

    https://doi.org/10.1016/j.biopsych.2003.10.010

Ruck, M. D., Abramovitch, R., & Keating, D. P. (1998). Children's and adolescents'

    understanding of rights: Balancing nurturance and self-determination. *Child

    Development*, *69*(2), 404–417. https://doi.org/10.1111/j.1467-

    8624.1998.tb06198.x

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of

    intrinsic motivation, social development, and well-being. *American Psychologist*,

    55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2018). *Self-determination theory: Basic psychological needs

    in motivation, development, and wellness* (Paperback edition). The Guilford Press.

Sherman, L. E., Payton, A. A., Hernandez, L. M., Greenfield, P. M., & Dapretto, M.

    (2016). The power of the like in adolescence: Effects of peer influence on neural

    and behavioral responses to social media. *Psychological Science*, *27*(7), 1027–

    1035. https://doi.org/10.1177/0956797616645673

Shouse, R. C. (1996). Academic press and sense of community: Conflict, congruence, and implications for student achievement. *Social Psychology of Education*, *1*(1), 47–68.

Silk, J. S., Davis, S., McMakin, D. L., Dahl, R. E., & Forbes, E. E. (2012). Why Do Anxious Children Become Depressed Teenagers?: The Role of Social Evaluative Threat and Reward Processing. *Psychological Medicine*, *42*(10), 2095–2107. https://doi.org/10.1017/S0033291712000207

Simon, B., & Grabow, H. (2014). To be respected and to respect: The challenge of mutual respect in intergroup relations. *British Journal of Social Psychology*, *53*(1), 39–53. https://doi.org/10.1111/bjso.12019

Simon, B., & Stürmer, S. (2003). Respect for Group Members: Intragroup Determinants of Collective Identification and Group-Serving Behavior. *Personality and Social Psychology Bulletin*, *29*(2), 183–193. https://doi.org/10.1177/0146167202239043

Sisk, C. L., & Zehr, J. L. (2005). Pubertal hormones organize the adolescent brain and behavior. *Frontiers in Neuroendocrinology*, *26*(3–4), 163–174. https://doi.org/10.1016/j.yfrne.2005.10.003

Spencer, S. J., Fein, S., & Lomore, C. D. (2001). Maintaining One's Self-Image Vis-à-Vis Others: The Role of Self-Affirmation in the Social Evaluation of the Self. *Motivation and Emotion*, *25*(1), 41–65. https://doi.org/10.1023/A:1010659805978

Stroud, L. R., Foster, E., Papandonatos, G. D., Handwerger, K., Granger, D. A., Kivlighan, K. T., & Niaura, R. (2009). Stress response and the adolescent

transition: Performance versus peer rejection stressors. *Development and Psychopathology*, *21*(1), 47–68. https://doi.org/10.1017/S0954579409000042

Teitelbaum, M., & Ben-Ze'ev, A. (2023). Politeness, Respect, Care, and Bias in Social Interactions. In C. Xie (Ed.), *Advancing (Im)politeness Studies: Cultural, Digital and Emotional Aspects* (pp. 73–92). Springer International Publishing. https://doi.org/10.1007/978-3-031-37064-9_5

Terburg, D., & van Honk, J. (2013). Approach–avoidance versus dominance–submissiveness: A multilevel neural framework on how testosterone promotes social status. *Emotion Review*, *5*(3), 296–302.

Tipton, E., Yeager, D. S., Iachan, R., & Schneider, B. (2019). Designing probability samples to study treatment effect heterogeneity. In P. J. Lavrakas (Ed.), *Experimental Methods in Survey Research: Techniques that Combine Random Sampling with Random Assignment.* (pp. 435–456). Wiley. https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119083771.ch22

Tomaszewski, W., Xiang, N., Huang, Y., Western, M., McCourt, B., & McCarthy, I. (2022). The Impact of Effective Teaching Practices on Academic Achievement When Mediated by Student Engagement: Evidence from Australian High Schools. *Education Sciences*, *12*(5), 358. https://doi.org/10.3390/educsci12050358

Torelli, C. J., Leslie, L. M., Stoner, J. L., & Puente, R. (2014). Cultural determinants of status: Implications for workplace evaluations and behaviors. *Organizational Behavior and Human Decision Processes*, *123*(1), 34–48. https://doi.org/10.1016/j.obhdp.2013.11.001

Trinkner, R., & Cohn, E. S. (2014). Putting the "social" back in legal socialization:

      Procedural justice, legitimacy, and cynicism in legal and nonlegal authorities.

      Law and Human Behavior, *38*, 602–617. https://doi.org/10.1037/lhb0000107

Tyler, T. R. (1990). *Why people obey the law: Procedural justice, legitimacy, and*

      compliance. Yale University Press.

Tyler, T. R. (2006). Restorative justice and procedural justice: Dealing with rule

      breaking. *Journal of Social Issues*, *62*(2), 307–326.

      https://doi.org/10.1111/j.1540-4560.2006.00452.x

Tyler, T. R. (2010). Why People Cooperate: The Role of Social Motivations. In *Why*

      People Cooperate. Princeton University Press.

      https://doi.org/10.1515/9781400836666

Tyler, T. R., & Blader, S. L. (2003). The group engagement model: Procedural justice,

      social identity, and cooperative behavior. *Personality and Social Psychology*

      Review, *7*(4), 349–361. https://doi.org/10.1207/S15327957PSPR0704_07

Tyler, T. R., & Jackson, J. (2014). Popular legitimacy and the exercise of legal authority:

      Motivating compliance, cooperation, and engagement. *Psychology, Public Policy,*

      and Law, *20*(1), 78–95. https://doi.org/10.1037/a0034514

Tyler, T. R., & Lind, E. A. (1992). A Relational Model of Authority in Groups. In M. P.

      Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 25, pp. 115–

      191). Academic Press. https://doi.org/10.1016/S0065-2601(08)60283-X

Vasquez, J. A. (1988). Contexts of learning for minority students. *The Educational*

      Forum, *52*(3), 243–253. https://doi.org/10.1080/00131728809335490

Voigt, R., Camp, N. P., Prabhakaran, V., Hamilton, W. L., Hetey, R. C., Griffiths, C. M.,
Jurgens, D., Jurafsky, D., & Eberhardt, J. L. (2017). Language from police body
camera footage shows racial disparities in officer respect. *Proceedings of the
National Academy of Sciences*, 201702413.
https://doi.org/10.1073/pnas.1702413114

von Rueden, C. (2014). The Roots and Fruits of Social Status in Small-Scale Human
Societies. In J. T. Cheng, J. L. Tracy, & C. Anderson (Eds.), *The Psychology of
Social Status* (pp. 179–200). Springer. https://doi.org/10.1007/978-1-4939-0867-
7_9

Walton, G. M. (2014). The new science of wise psychological interventions. *Current
Directions in Psychological Science*, *23*(1), 73–82.

Walton, G. M., & Cohen, G. L. (2011). A Brief Social-Belonging Intervention Improves
Academic and Health Outcomes of Minority Students. *Science*, *331*(6023), 1447–
1451. https://doi.org/10.1126/science.1198364

Walton, G. M., Murphy, M. C., Logel, C., Yeager, D. S., Goyer, J. P., Brady, S. T.,
Emerson, K. T. U., Paunesku, D., Fotuhi, O., Blodorn, A., Boucher, K. L., Carter,
E. R., Gopalan, M., Henderson, A., Kroeper, K. M., Murdock-Perriera, L. A.,
Reeves, S. L., Ablorh, T. T., Ansari, S., … Krol, N. (2023). Where and with
whom does a brief social-belonging intervention promote progress in college?
Science, *380*(6644), 499–505. https://doi.org/10.1126/science.ade4420

Walton, G. M., & Wilson, T. D. (2018). Wise interventions: Psychological remedies for

    social and personal problems. *Psychological Review*, *125*(5), 617–655.

    https://doi.org/10.1037/rev0000115

Walton, G. M., & Yeager, D. S. (2020). Seed and soil: Psychological affordances in

    contexts help to explain where wise interventions succeed or fail. *Current*

    Directions in Psychological Science, *29*(3), 219–226.

    https://doi.org/10.1177/0963721420904453

Ware, F. (2006). Warm Demander Pedagogy: Culturally Responsive Teaching That

    Supports a Culture of Achievement for African American Students. *Urban*

    Education, *41*(4), 427–456. https://doi.org/10.1177/0042085906289710

Yates, J. R., Beckmann, J. S., Meyer, A. C., & Bardo, M. T. (2013). Concurrent choice

    for social interaction and amphetamine using conditioned place preference in rats:

    Effects of age and housing condition. *Drug and Alcohol Dependence*, *129*(3),

    240–246. https://doi.org/10.1016/j.drugalcdep.2013.02.024

Yeager, D. S. (2019). *The National Study of Learning Mindsets, [United States], 2015-*

    2016. Inter-university Consortium for Political and Social Research [distributor].

    https://doi.org/10.3886/ICPSR37353.v1

Yeager, D. S., Carroll, J. M., Buontempo, J., Cimpian, A., Woody, S., Crosnoe, R.,

    Muller, C., Murray, J., Mhatre, P., Kersting, N., Hulleman, C., Kudym, M.,

    Murphy, M., Duckworth, A. L., Walton, G. M., & Dweck, C. S. (2022). Teacher

    Mindsets Help Explain Where a Growth-Mindset Intervention Does and Doesn't

Work. *Psychological Science*, *33*(1), 18–32.

https://doi.org/10.1177/09567976211028984

Yeager, D. S., Dahl, R. E., & Dweck, C. S. (2018). Why interventions to influence

adolescent behavior often fail but could succeed. *Perspectives on Psychological*

Science, *13*(1), 101–122. https://doi.org/10.1177/1745691617722620

Yeager, D. S., & Dweck, C. S. (2012). Mindsets That Promote Resilience: When

Students Believe That Personal Characteristics Can Be Developed. *Educational*

Psychologist, *47*(4), 302–314. https://doi.org/10.1080/00461520.2012.722805

Yeager, D. S., Hanselman, P., Walton, G. M., Murray, J. S., Crosnoe, R., Muller, C.,

Tipton, E., Schneider, B., Hulleman, C. S., Hinojosa, C. P., Paunesku, D.,

Romero, C., Flint, K., Roberts, A., Trott, J., Iachan, R., Buontempo, J., Yang, S.

M., Carvalho, C. M., … Dweck, C. S. (2019). A national experiment reveals

where a growth mindset improves achievement. *Nature*, *573*(7774), 364–369.

https://doi.org/10.1038/s41586-019-1466-y

Yeager, D. S., Henderson, M. D., Paunesku, D., Walton, G. M., D'Mello, S., Spitzer, B.

J., & Duckworth, A. L. (2014). Boring but important: A self-transcendent purpose

for learning fosters academic self-regulation. *Journal of Personality and Social*

Psychology, *107*(4), 559–580. https://doi.org/10.1037/a0037637

Yeager, D. S., Purdie-Vaughns, V., Garcia, J., Apfel, N., Brzustoski, P., Master, A.,

Hessert, W. T., Williams, M. E., & Cohen, G. L. (2014). Breaking the cycle of

mistrust: Wise interventions to provide critical feedback across the racial divide.

Journal of Experimental Psychology: General, *143*(2), 804–824.

https://doi.org/10.1037/a0033906

Yeager, D. S., Purdie-Vaughns, V., Hooper, S. Y., & Cohen, G. L. (2017). Loss of

Institutional Trust Among Racial and Ethnic Minority Adolescents: A

Consequence of Procedural Injustice and a Cause of Life-Span Outcomes. *Child

Development*, *88*(2), 658–676. https://doi.org/10.1111/cdev.12697

Yeager, D. S., Romero, C., Paunesku, D., Hulleman, C. S., Schneider, B., Hinojosa, C.,

Lee, H. Y., O'Brien, J., Flint, K., Roberts, A., Trott, J., Greene, D., Walton, G.

M., & Dweck, C. S. (2016). Using design thinking to improve psychological

interventions: The case of the growth mindset during the transition to high school.

Journal of Educational Psychology, *108*(3), 374–391.

https://doi.org/10.1037/edu0000098

Yeomans, M., Kantor, A., & Tingley, D. (2018). The politeness Package: Detecting

Politeness in Natural Language. *R Journal*, *10*(2).

Yeomans, M., Minson, J., Collins, H., Chen, F., & Gino, F. (2020). Conversational

receptiveness: Improving engagement with opposing views. *Organizational

Behavior and Human Decision Processes*, *160*, 131–148.

https://doi.org/10.1016/j.obhdp.2020.03.011