HHS Public Access

Author manuscript

Perspect Psychol Sci. Author manuscript; available in PMC 2019 January 01.

Published in final edited form as:

Perspect Psychol Sci. 2018 January ; 13(1): 101–122. doi:10.1177/1745691617722620.

Why Interventions to Influence Adolescent Behavior Often Fail but Could Succeed

David S. Yeager,
University of Texas at Austin

Ronald E. Dahl, and
University of California, Berkeley

Carol S. Dweck
Stanford University

Abstract

This paper provides a developmental science-based perspective on two related issues: (1) why traditional preventative school-based interventions work reasonably well for children, but less so for middle adolescents, and (2) why some alternative intervention approaches show promise for middle adolescents. The authors propose the hypothesis that traditional interventions fail when they do not align with adolescents' enhanced desire to feel *respected* and be accorded *status*; however, interventions that do align with this desire can motivate internalized, positive behavior change. The paper reviews examples of promising interventions that (1) directly harness the desire for status and respect, (2) provide adolescents with more respectful treatment from adults, or (3) lessen the negative influence of threats to status and respect. These examples are in the domains of unhealthy snacking, middle school discipline, and high school aggression. Discussion centers on implications for basic developmental science and for improvements to youth policy and practice.

Keywords

adolescence; behavior change; puberty; testosterone; autonomy; status; interventions

Adolescence is a maturational period of tremendous learning, exploration, and opportunity (for reviews see Blakemore & Mills, 2014; Crone & Dahl, 2012; Steinberg, 2014; Telzer, 2016). It is also a time when behavioral and health problems can emerge or worsen, creating consequences that "stick" long into adulthood (e.g. Paus, Keshavan, & Giedd, 2008). For instance, depressive symptoms rise substantially during adolescence (Andersen & Teicher, 2008; Merikangas et al., 2010), and most depressed adults suffered their first depressive episode during adolescence (e.g. Pine, Cohen, Gurley, Brook, & Ma, 1998). Likewise, school engagement often declines during the transition to high school (see Benner, 2011),

Correspondence concerning this article should be addressed to David S. Yeager, 108 E. Dean Keeton Stop A8000, Austin, TX, 78712-1043. dyeager@utexas.edu.

To appear in Perspectives on Psychological Science

and students who drop out of high school go on to earn substantially lower wages even if they later earn a GED (see Heckman, Humphries, & Kautz, 2014)

Educational interventions delivered broadly in schools (i.e., *universal preventative interventions*) are commonly implemented with the aim of preventing these and other problems, including bullying, violence, obesity, delinquency, substance abuse, and teen pregnancy (see Steinberg, 2015 for a commentary). The theory of change underlying many of these interventions comes out of behavioral decision-making theories (e.g., Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Fischhoff, 2008; Fishbein, 2008), which propose that increasing knowledge of health risks, skills for achieving health goals, and awareness of societal values regarding healthy behavior will lead to positive behavior change. Traditional interventions based in these theories typically involve classroom presentations that present relevant health information and invite young people to practice implementing skills (via scenarios, skits, or homework), coupled with school-wide assemblies or announcements during which adults publicly endorse the values taught by the program (see descriptions in Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Stice, Shaw, & Marti, 2006; Yeager, Fong, Lee, & Espelage, 2015).

Unfortunately, just at the developmental stage when universal prevention programs are perhaps most needed, traditional programs show reduced effectiveness. Indeed, Heckman and Kautz (2013), after a review of the literature, concluded, “programs that target adolescents have not been established to be as effective as programs that target earlier ages” (p. 35). Going a step further, Steinberg (2015) stated that adolescent “classroom-based health education is an uphill battle against evolution and endocrinology, and it is not a fight we are likely to win” (p. 711).

This pessimism may be justified given the data we review below. However, the limited success of many traditional prevention efforts might say more about the methods they employ than the impossibility of positive behavior change during adolescence.

In the present paper we propose an explanation for why comprehensive and lengthy school-based universal prevention efforts often go from being somewhat effective with children to being mostly ineffective with middle adolescents. Furthermore, the paper explores why some alternative interventions are showing promising effects in middle adolescence, even though they are relatively targeted and efficient (Cohen & Sherman, 2014; Lazowski & Hulleman, 2015; Walton, 2014; Wilson, 2011; Yeager & Walton, 2011). Our thesis is that adolescents are more sensitive to whether they are being treated with respect and accorded high status, as compared to children. Traditional programs might work against this sensitivity, but effective adolescent interventions allow young people to make choices that benefit their long-term future while also feeling respected and high status in the short term.

Overview of the paper

In the remainder of this paper, we first review evidence from multiple domains that show age-related declines in the efficacy of traditional adolescent problem-behavior prevention. Second, we offer a preliminary developmental model that could account for this. The model integrates emerging evidence in multiple areas of developmental science, including

neuroscience, physiology, and the study of adolescent emotion and behavior. Third, acknowledging that we cannot definitively test this new model based on existing data, we provide evidence from interventions that have shown efficacy in adolescence and that support specific aspects of the model. Fourth, we discuss research ideas for further evaluating and extending the model—and ultimately creating the next generation of improved interventions.

Defining adolescence

Following many past reviews, we define adolescence as the maturational period that begins at the onset of puberty and ends with a transition to an adult-like role in society (e.g., Blakemore & Mills, 2014; Crone & Dahl, 2012; Steinberg, 2014). Thus, adolescence is thought to have a biological onset and a socio-cultural offset.

We focus mainly on "middle adolescence" because this is where the developmental patterns we review here are most striking and where there are plausible developmental mechanisms that could account for them. Middle adolescence is defined as a period after the initial stages of pubertal maturation have begun, but before young people have fully adjusted to the rapid developments in their bodies and before they have been accorded adult-like status by society. In developed nations such as the U.S., the middle adolescent period refers roughly to the ages of 13 or 14 to 17, or grades 7 or 8 to 11.

We acknowledge that chronological age is only a proxy for the relevant developmental processes. The onset of puberty occurs at different chronological ages for different individuals, and maturation can vary substantially across racial, ethnic, or socio-economic groups. Moreover, pubertal maturation involves a series of cascading biological processes (increases in pubertal hormones, and rapid physical changes including body hair, sexual maturation, height velocity, menarche) that can occur in a coordinated fashion, or not (see Mendle, 2014). Nonetheless, we describe findings in terms of *chronological age* or *grade level* because (a) the existing evidence base primarily reports these, and (b) these co-vary with purported developmental mechanisms. As future intervention studies begin to include measures of pubertal maturation and other developmental processes, greater precision will become possible.

Evidence for Age-Related Declines in Traditional Intervention Efficacy

Effect sizes from meta-analyses of a variety of adolescent interventions suggest that average benefits are weaker among middle adolescents (ages 13 to 17) as compared to young children or children transitioning into adolescence (ages 9–12). This is true for individual studies with large sample sizes (e.g., Karna et al., 2011), but below we focus on meta-analyses.

Consider interventions to prevent obesity. A meta-analysis of 64 universal interventions (Stice et al., 2006) found that healthy-eating and exercise-promotion interventions were effective for young children and early adolescents, but not for middle adolescents. For the latter age group, effect sizes clustered around zero and many effect sizes were negative,

meaning that adolescents in many programs tended to gain more weight when they received an anti-obesity program compared to when they did not.

In the domain of depression prevention, one meta-analysis (Horowitz & Garber, 2006) reported that universal preventative interventions for middle adolescents had non-significant average effect of d=.02 at follow-up (p. 409), and weaker effects for adolescents compared to adults. Another (Stice, Shaw, Bohon, Marti, & Rohde, 2009) showed non-significant effects of universal interventions at follow-up, r=.07. Furthermore, we conducted a between-study meta-regression of the Stice et al. (2009) results for children and adolescents only (using data reported in Table 4, pp. 496-7) and found a negative correlation between effect size and age, r=−.48, such that middle adolescents showed smaller (and non-significant) effects compared to younger individuals.[1]

Or consider social-emotional skill training interventions in general, which teach an array of coping and social skills. Durlak, Weissberg, Dymnicki, Taylor, and Schellinger (2011) meta-analyzed 213 school-based, universal social and emotional interventions delivered from kindergarten to 12th grade. A between-study analysis of moderators found a negative correlation between age and effect size, r=−.27, such that middle adolescents showed smaller improvements in social-emotional skills relative to younger children.

These results, although informative, are potentially subject to ecological fallacies. Meta-regressions compare different interventions given to children of different ages, and therefore mask the possibility that the same intervention given to different age groups in the same study might show a different moderation pattern (for a commentary see Cooper & Patall, 2009). However, a recent meta-analysis of anti-bullying interventions avoided this ecological fallacy. Yeager et al. (2015) obtained an effect size for separate age groups in a given study (72 effect sizes total) and then estimated within-study age-related trends. This analysis found that traditional anti-bullying interventions were effective from early childhood to early adolescence (d = .13). When the interventions were delivered to middle adolescents (8th grade or above), however, there was a decline to a null effect (d=.01) (see Figure 1). That is, the interventions that are available to high schools for purchase have not yet been effective, on average, even though several states in the U.S. have mandated that schools purchase and implement anti-bullying programs (Bierman, 2010).

Pessimism about traditional intervention approaches delivered to middle adolescents also comes from meta-analyses of studies conducted only within this age group. Interventions to reduce recidivism for juvenile delinquents were summarized in a meta-analysis of 28 studies and 19,301 youths aged 12 to 16. It found no significant average benefits (Schwalbe, Gearing, MacKenzie, Brewer, & Ibrahim, 2012). There was heterogeneity, however, and one type of intervention, restorative justice, showed benefits (we will return to this later).

[1]The average effect size for universal interventions was not reported in the Stice et al. (2009) paper but we calculated a weighted average using the effect sizes in their Table 4. Stice et al. (2009) also report a between-study meta-regression for age that was not relevant because it combined indicated (i.e., for at-risk youth) and universal interventions; our interest here was in universal interventions. That meta-regression reported a positive effect of age (p. 498), but it is driven by the college student studies, which were only indicated and not universal.

In sum, traditional interventions to prevent problematic behavior or health outcomes have shown some promise with children or early adolescents. There is not yet strong evidence that the traditional programs show benefits on average for middle adolescents, which in the U.S. spans the end of middle school and the first few years of high school.

This summary is not the final word, however. First, only one of the meta-analyses we reviewed (Yeager et al., 2015) employed a within-study moderation by age. Second, there was often unexplained heterogeneity in past meta-analyses. We are not saying that no traditional intervention has ever been effective with middle adolescents, or that no traditional intervention ever could be effective. All we can conclude is that traditional interventions that have appeared in meta-analyses have not yet been effective on average for middle adolescents across multiple domains—including obesity prevention, depression prevention, bullying, recidivism, and social-emotional skill-building in general—even though evaluations of the same or similar programs found benefits for younger individuals.

A Proposed Framework for Understanding and Improving Adolescent Interventions

Do the discouraging results of traditional intervention evaluations mean that, by middle adolescence, we have missed our window for creating positive behavior change? That patterns of behavior have become set, like plaster? We do not think so.

Adolescence is a dynamic period of learning and change (Casey, 2015; Steinberg, 2014; Telzer, 2016), especially, we argue, when what adolescents are learning about or changing is relevant to status and respect in their lives (see Blakemore & Mills, 2014; Crone & Dahl, 2012). We argue that:

1. Compared to younger individuals, middle adolescents show a greater *sensitivity to status and respect*, resulting from pubertal maturation (e.g. changes in hormones), changes in social context (e.g. school transtions), and social-cognitive developments;
2. Traditional interventions do not sufficiently honor this greater sensitivity to status and respect, making the interventions less effective;
3. Improved interventions could honor the sensitivity to status and respect and thereby capture adolescent attention and motivation to create behavior change.

Defining the sensitivity to status and respect

We define the *sensivity to status and respect* as a readiness to align attention, motivation, and behavior with the potentially-rewarding feelings that come from attaining status or being respected. We define aspects of this construct in turn. *Status* is defined as one's relative rank in a social hierarchy (see Anderson, Hildreth, & Howland, 2015; Maner & Case, 2016; Mattan, Kubota, & Cloutier, 2017). Individuals discern their status in part based on how others treat them, and in particular whether others treat them with *respect* (Anderson et al., 2015; Miller, 2001). Respect is a complex, gestalt social judgment that hinges on whether one is being granted the rights one expects to be granted in one's role in society (see Miller,

2001; Ruck, Abramovitch, & Keating, 1998; also see an analysis of naturalistic respectful language in Voigt et al., 2017). Anthropological, evolutionary, and psychological perspectives have noted that individuals feel respected and high status when they are treated as though they are competent, have agency and autonomy, and are of potential value to the group (e.g., when supporting self-determination rights, Ryan & Deci, 2000; also see a discussion of "prestige" in Maner & Case, 2016). Finally, status and respect-relevant experiences can be highly rewarding (e.g., L. E. Sherman, Payton, Hernandez, Greenfield, & Dapretto, 2016); they elicit social emotions such as pride and admiration, making them motivationally salient. Likewise, being disrespected or treated as low status can be painful and elicit social emotions such as shame or humiliation.

1. Compared to younger students, middle adolescents are more sensitive to status and respect

Evidence from three sources shows that middle adolescents have a greater sensitivity to status and respect than younger individuals.

Pubertal hormones—The first source of evidence involves hormones affected by pubertal maturation, such as testosterone, estradiol, cortisol, oxytocin, and dehydroepiandrosterone (DHEA) (e.g., Klapwijk et al., 2013; for reviews see Blakemore, Burnett, & Dahl, 2010; Peper & Dahl, 2013; Sisk & Zehr, 2005). We focus mostly on testosterone because more is known about its relevance to status-pursuit and maintenance.

Testosterone increases dramatically after the onset of puberty in both boys and girls (see Figure 6 in Braams, van Duijvenvoorde, Peper, & Crone, 2015). Testosterone is often stereotyped as an "aggression" or "sex" hormone (Eisenegger, Naef, Snozzi, Heinrichs, & Fehr, 2010), but a growing line of research in both humans and animals suggests it increases the motivation to search for, learn about, and maintain status in one's social environment (De Lorme & Sisk, 2013; Eisenegger, Haushofer, & Fehr, 2011; Josephs, Sellers, Newman, & Mehta, 2006; Mehta & Josephs, 2006; for a review see Terburg & van Honk, 2013).

At an attentional level, endogeneous levels of testosterone predict greater reactivity to status-relevant emotional stimuli (Goddings, Burnett Heyes, Bird, Viner, & Blakemore, 2012). Demonstrating causality, experimentally administered testosterone has increased adults' attention to status-relevant stimuli, such as cues of physical dominance (Goetz et al., 2014; Welling, Moreau, Bird, Hansen, & Carré, 2016; for a review see Bos, Panksepp, Bluthé, & van Honk, 2012).

Behaviorally, testosterone predicts a readiness to learn about the criteria for status and respect in a given context and then behave in ways that satisfy those criteria. In a classic study, adolescent males high in endogeneous testosterone showed greater *aggression* when they had deviant friends, but greater *leadership* when they did not have deviant friends (Rowe, Maughan, Worthman, Costello, & Angold, 2004). In a recent study with adults, experimentally-administered testosterone promoted either anti-social or pro-social behavior depending on which type of behavior the experimenter led participants to believe would enhance status the most (Dreher et al., 2016; for a related Syrian hamster study, see De Lorme & Sisk, 2013).

Illustrating our model, another recent laboratory experiment (Yeager, Hirschi, & Josephs, 2017) randomly assigned adults to be asked to carry out an unpleasant but healthy behavior (i.e., taking "medicine" that was actually a spoonful of Vegemite, a yeast extract). Language was either *respectful* and honored autonomy and competence (e.g., "you might consider taking the medicine") or was *disrespectful* and threatened autonomy and competence (e.g., "just take the medicine" cf. Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004)). Respectful language increased adherence—participants consumed 60% more medicine—and sensitivity to respectful language was stronger among those high in endogeneous testosterone (measured via saliva) and also among low-testosterone individuals who were administered testosterone (via nasal spray; Yeager, Hirschi, et al., 2017). This is direct evidence for a key claim of our model: testosterone—a hormone implicated in pubertal maturation—causes an increased behavioral responsiveness to respectful treatment.

Reactivity to social threat—Second, middle adolescents have shown greater reactivity to experiences that threaten status, at multiple levels of analysis. In one study, middle adolescents (age 15) showed a significant cortisol response when they faced a social threat (i.e. the Trier Social Stress Test (TSST); Kirschbaum, Pirke, & Hellhammer, 1993), but children and early adolescents (age 9–13) did not (Gunnar, Wewerka, Frenn, Long, & Griggs, 2009). The exception was 13-year-old girls who did show cortisol reactivity. This finding is consistent with the notion that pubertal maturation (which girls experience at earlier ages than boys), and not chronological age, causes a greater sensitivity to status and respect threats. In another study, middle adolescents who suffered a threat to status (i.e. peer rejection) reported greater distress and showed more neural activation in regions associated with social cognition, compared to children or younger adolescents (Gunther Moor, van Leijenhorst, Rombouts, Crone, & Van der Molen, 2010). Furthermore, the simple act of being watched by a peer elicited more embarrassment among middle adolescents compared to younger individuals (Somerville et al., 2013; also see research on the adolescent "imaginary audience" by Elkind & Bowen, 1979).

Social-cognitive developments—Third, middle adolescents come to perceive adult authorities' efforts to influence their behavior, even when seemingly benign, as a sign that they are being disrespected or deprived of adult-like status. Research on *self-determination rights* (Ruck et al., 1998; Ruck et al., 2002; also see Ryan & Deci, 2000; Smetana & Villalobos, 2009) shows that adolescents, as compared to children, come to disagree with adults' judgments that they are not ready to display agency and control over personal choices. In one study (Ruck et al., 1998), participants aged 8 to 16 responded to scenarios in which, for example, an adolescent wrote a story for the school paper that was critical of school rules and the principal suppressed it. Only about half of the children and early adolescents (age 8–12) said the adult should have respected the adolescent's right to exert agency over the situation, but nearly three-fourths of middle adolescents (age 14–16) did (calculations conducted with statistics reported in Table 2 on p. 208 of Ruck et al., 1998). More tellingly, eighth grade (roughly age 14) was the grade level with the largest gap between adolescents' beliefs that adults should respect their right to make their own choices, on the one hand, and adults' beliefs that adolescents are competent enough to do so, on the

other (Ruck, Peterson-Badali, & Day, 2002; also see Ruck et al., 1998; for a related perspective on the "maturity gap," see Moffitt, 1993).

2. Interventions are less effective when they fail to honor this adolescent sensitivity to status and respect

We argue that many universal school-based preventative interventions, both in *what they say* and *how they say it*, insufficiently honor adolescents' desire to feel respected and accorded status. This can make the interventions less effective.

What the interventions say—*What* might ineffective interventions be saying that conflicts with adolescents' desire to feel respected and high status? Traditional interventions often focus on providing knowledge or self-regulation skills with the intent of suppressing short-term desires for the sake of long-term goals. In doing so, these interventions may ignore or fight against the powerful reasons why adolescents are engaging in the "problem" behavior in the first place (for a related argument see Ellis et al., 2012).

Recall the ineffective anti-bullying interventions for adolescents (Yeager et al., 2015). Why do adolescents bully? It is not always because they fail to understand aggression hurts others, or because they categorically lack self-control. Although deficits in social and cognitive skills predict greater bullying in childhood, as expected, the same is not true for high school students (for meta-analytic evidence see Cook, Williams, Guerra, Kim, & Sadek, 2010). Middle adolescents often bully to gain or demonstrate social status (Pellegrini & Long, 2002). Moderate-to-highly popular youth—who often have sufficient self-regulatory skills and knowledge of societal norms about aggression, but also have the requisite social competence to strategically undermine others' reputations—often bully the most (Faris & Felmlee, 2011; see Yeager et al., 2015 for a review). Hence traditional interventions that enhance social and cognitive skills among middle adolescents are not always addressing the underlying motivation—a desire to gain or demonstrate social reputation—and may even be increasing the social skills young people need to bully more effectively.

How the interventions say it—*How* do traditional interventions deliver their messages, and how might these modes of delivery be problematic? Heavy-handed methods of instruction— lectures, assemblies, homework—may backfire even when they are disseminating relevant information. Many adolescents are already aware that risky behaviors are bad for their health (for a review see Reyna & Farley, 2006). Imparting information adolescents feel they already have, repeatedly over multiple sessions and in multiple forms, may come across as infantilizing and therefore disrespectful.

We note that research has not definitively shown that *how* an intervention presents its message—its format or tenor—can threaten status or respect and undermine behavior change. However, research has shown that adult-delivered messages that come across as nagging can affect relevant adolescent brain activity. One study found that maternal nagging activating anger-related regions and reducing activity in regions related to planning how to change behavior (Lee et al., 2014).

Furthermore, skill-building programs that require high school students to risk social status to participate can reduce use of the program—even when adolescents know that the skills are useful for their long-term goals. For instance, one field experiment made an SAT-prep course seem low-status. That decreased signups for the free course, even though students believed te course was helpful and knew that high SAT scores were critical for college admission and long-term success (Bursztyn & Jensen, 2015).

Finally, Allen, Philliber, and Herre (1994) showed that adolescents' reports that an intervention supported their feelings of autonomy—a key contributor to feelings of respect and status in adolescence—moderated the efficacy of a school-based preventative intervention on outcomes such as course failures, suspensions, and pregnancy. Adolescents benefitted less when they said that they felt "like the facilitator makes all the decisions" and "the facilitator doesn't listen to things they say," but stronger benefits when they said that they got "to help decide what the group will do" and that the "facilitator really listens to things they say" (Allen et al., 1994).

3. More effective interventions honor the sensitivity to status and respect and promote attention, motivation, and behavior as a result

Last, we argue that it may be possible to capitalize on adolescents' sensitivity to status and respect and redirect it toward positive behavior change.

Imagine interventions that make a young person feel that he or she is worthy of respect and is admired by others. Such interventions would treat young people as though they have worthwhile knowledge, as though they have the ability to exercise their agency in life, and as though they have the potential to make a contribution and be of value to the group. Perhaps even time-limited exposures to such feelings of status and respect could, during this sensitized period of adolescence, be enough to start a meaningful change in behavior. In the remainder of the paper, we discuss various methods to move programs closer to achieving this possibility.

Three Case Studies

Overview

We present concrete examples of interventions that, in various ways, were sensitive to adolescents' desire for status and respect. These illustrate three different approaches:

1. Harnessing the adolescent desire for status and respect
2. Making interactions with adults more respectful
3. Lessening the influence of status and respect threats.

This list is illustrative, not exhaustive. Examples come from the domains of unhealthy snacking, school discipline, and aggression. All of the interventions were evaluated with participants who were between the second semester of 7^{th} grade and the second semester of 10^{th} grade, which is the age range during which traditional interventions lose effectiveness, on average.

Since these represent relatively new approaches, the interventions are more limited in scope and the data are usually from shorter-term demonstrations of efficacy (sometimes one day to a few weeks). However, each case we present shows initial promise, speaks to the theoretical model proposed here, and includes evidence of mechanisms. Therefore each may serve as a guide for the development or improvement of future interventions.

The examples come primarily from studies that we or our colleagues conducted, because we know them intimately and, more importantly, because they included measures of our proposed mechanisms. However, many other examples could have illustrated similar points, most notably in the domain of academic achievement (J. M. Aronson, Fried, & Good, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Destin & Oyserman, 2009; Eskreis-Winkler et al., 2016; Gehlbach et al., 2016; Good, Aronson, & Inzlicht, 2003; Hulleman & Harackiewicz, 2009; Paluck & Shepherd, 2012; D. K. Sherman et al., 2013; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012; for a review see Wilson, 2011).

Finally, each of the interventions reviewed in detail required relatively little time for participants to complete. This does not mean that they took relatively little time to *develop*; R&D can last several years and involve thousands of participants (e.g., Yeager, Romero, et al., 2016). Nor does the brevity of the interventions we highlight mean that longer and more comprehensive interventions cannot be attuned to the adolescent desire for status and respect. We review successful, longer interventions after the three cases.

1. Harnessing the adolescent desire for status and respect: The case of unhealthy snacking

Can the adolescent desire for status and respect be harnessed and put to use in the service of healthy behavior? Bryan, Yeager, and colleagues (2016) recently developed a behavioral approach to reduce junk food snacking among 8th grade students. Bryan et al. (2016) began with the presumption that, for many adolescents, healthy eating is construed as low status—for instance, adolescents may believe that *"healthy eaters are lame nerds who do what their parents tell them*." To combat this, Bryan et al. (2016) sought to re-define what it meant to be a healthy eater so that it had greater social-status appeal, by creating the impression that "*healthy eaters are independent-minded people who make the world a better place*."

What did the intervention say to make healthier eating seem "high-status"? The Bryan et al. intervention took the form of an exposé of industry practices (see the right column in Table 1). It used journalistic accounts (e.g., Moss, 2013) to describe how food companies pay scientists to make junk food addictive to children's brains; how companies hired former tobacco executives to use cartoons to market the food to children so they could become addicted; and how food executives themselves will not eat the junk food or let their children eat it, making them hypocrites.

Hence, the intervention led to the conclusion that people who buy junk food are giving money to executives who are disrespecting young people by thinking they will not stand up for themselves. Viewed from this perspective, being the kind of person who stands up to these executives by eschewing junk food is status-enhancing—it allows one to join a social

movement and it affords the chance to demonstrate one's competence and mastery over adult authorities.

The Bryan et al. (2016) approach was inspired in part by the "truth® " anti-smoking campaign (Farrelly et al., 2002; Farrelly, Davis, Haviland, Messeri, & Healton, 2005; Henriksen, Dauphinee, Wang, & Fortmann, 2006). In the truth® campaign, television advertisements depicted rebellious, autonomous adolescents flooding the streets, screaming into megaphones at rich, old tobacco executives in high-rise buildings in Manhattan, telling them to "take a day off" from tricking and harming children for the sake of profit. This harnessed the desire for status and respect. In an evaluation study, teens exposed to the truth® campaign said "not smoking is a way to express independence" and disagreed that "smoking makes people your age look cool" (Farrelly, Davis, Duke, & Messeri, 2009). In a policy evaluation study, the truth® campaign was estimated to have prevented 450,000 adolescents from initiating smoking (Farrelly, Nonnemaker, Davis, & Hussin, 2009).

How did the Bryan et al. (2016) intervention convey its message? It used now-common methods for social-psychological interventions, which, in retrospect, appear to offer respect and high status (Cohen, Garcia, & Goyer, 2017; Cohen & Sherman, 2014; Walton, 2014; Yeager & Walton, 2011). These social-psychological intervention methods do not "tell" adolescents what to do and not do, so much as they invite adolescents to "discover" the meaning of the messages for their own lives, honoring adolescents' expectation that they not be treated as child-like.

For instance, the Bryan et al. (2016) exposé article takes the form of a news article that the food industry does not want you to read—giving it an illicit status. Next, adolescents, after reading the article, read quotes from irate, high-status older adolescents (e.g., high school football players) who previously read the article and vowed not to eat junk food out of protest. This capitalizes on the psychology of *descriptive norms*—or the notion that individuals may conform to the choices of relevant others when presented with consensus information about their behaviors (Cialdini, 2003). Descriptive norms directly influence adolescents' willingness to conform to behavior, especially when norms come from high-status peers (see Helms et al., 2014).

Adolescents were next asked to author a letter to a future student (i.e. to engage in *self-persuasion*), in which participants explained how they planned on rebelling against the food companies by eating healthy food and avoiding junk food (for a review of self-persuasion see E. Aronson, 1999). First, self-persuasion respects a person's potential for personal agency—the prompts do not say "you *have to* believe this" but rather "would you *mind* choosing to write an argument for why someone *might* want to believe this?" (cf. Vansteenkiste et al., 2004). Second, self-persuasion respects a person's competence—it implies "you have wisdom and experience to share with a peer that we adults may not have," as opposed to "we know the facts and you do not." Third, self-persuasion respects a person's purpose and value to the group, by allowing adolescents to engage in a prosocial act of helping future students learn important information.

Bryan et al. (2016) call the exposé article a "values-harnessing" treatment. It showed efficacy in an initial, double-blind, randomized, behavioral experiment with over 450 8th grade students (Bryan et al., 2016). The evaluation involved two control conditions: a no-treatment control, and a traditional healthy eating control that used materials from contemporary government anti-obesity efforts (i.e., choosemyplate.org) and appealed to the long-term benefits of eating healthy (See Table 1). All conditions included self-administered reading and writing exercises, lasted approximately 30 minutes, were randomized at the student level, and were administered in sealed, individualized packets during class.

The key behavioral outcome was measured the next day. The principal announced that the entire 8th grade class would get a "snack pack," and students received a menu that had healthy food options (fruit, nuts, water) and unhealthy food options (Hot Cheetos, Oreos, Coca-Cola), as a reward for good behavior during state testing.

The Bryan et al. (2016) values-harnessing treatment reduced the total sugar content of the selections by 3.6 grams, or 9% (d=.20) compared to the two control conditions, which did not differ. More importantly for the framework advanced here, a mediational analysis showed that the values-harnessing treatment caused adolescents to construe healthy eating as more aligned with the desire for status and respect. The treatment increased the *social-status appeal* of the healthy behavior ("I respect healthy eaters more than unhealthy eaters"), and this mediated the effects of the treatment on behavior (Figure 2).

Discussion—The Bryan et al. (2016) values-harnessing intervention is, of course, not the whole solution to adolescent obesity. The follow-up was only one day post-intervention, and the intervention would mostly likely need to be coupled with programs to increase the availability of healthy foods, especially in low-income communities. Instead, the Bryan et al. (2016) approach is an early-stage investigation that helps develop theory. It illustrates one way that adolescents' prioritization of status and respect-relevant learning can be harnessed for positive change. This approach may well prove useful in other domains of health behavior.

2. Making interactions with adults more respectful: The case of race disparities in middle school discipline

The values-harnessing approach tries to make adolescents *more* aware of how some adults were disrespecting them, and then channel the resulting feelings into positive behavior change. A second approach is to change the environment and *reduce* adolescents' experiences of being disrespected by the adults around them, which can engender greater adherence with rules and procedures. Our second case focuses on methods to address discipline infractions, with particular attention to disparities in the rates at which Latina/o or African-American youth are disciplined compared to their white or Asian peers (see Carter, Fine, & Russell, 2014; Crenshaw, Ocen, & Nanda, 2015; Losen, 2014; Okonofua, Walton, & Eberhardt, in press; Tyler, Goff, & MacCoun, 2015).

Intuitively, school discipline problems might be solved by creating strong threats to deter deviant behavior in school (i.e. zero-tolerance policies; see the left column of Table 2). This "zero tolerance" approach, however, has produced very few benefits in numerous

evaluations. In some cases, zero tolerance has increased racial disparities, perhaps by licensing authorities to rely on stereotypes when doling out harsh punishments (American Psychological Association Zero Tolerance Task Force, 2008; Heitzeg, 2009).

An alternative approach stems from the possibility that disparities in discipline infractions are the result, in part, of daily experiences of disrespect that come from being targeted by stigma and stereotypes (Okonofua et al., in press). When individuals are disrespected by authorities, they perceive it to be unjust (see Miller, 2001). When individuals perceive injustice, it undermines the legitimacy of an institutional authority and erodes a willingness to comply (see Tyler, 1990).

A potential method to recuce school discipline problems among adolescents, then, is to make the environment more respectful (for a related argument in criminology, see Tyler, 2006). Recall that programs that implement *restorative justice*—or the tendency to work collaboratively with a young person to repair relationships and reputation after carrying out an offense, such as through conferences or victim-offender mediation. These were among the only traditional programs to reduce recidivism in the juvenile justice system (Gregory, Clawson, Davis, & Gerewitz, 2014; Schwalbe et al., 2012). Restorative justice interventions honor young people's ability to self-govern and they presume their good intentions, perhaps creating an experience of respect and encouraging to rule-following.

In a similar spirit, two studies, reviewed in detail here, illustrate how adults might create respectful environments in schools and how these environments can reduce the prevalence of disciplinary infractions. First, Okonofua, Paunesku, and Walton (2016) evaluated an intervention for middle school that was designed to change teachers' beliefs about discipline — that discipline should be empathic, not "zero tolerance." Treated teachers were encouraged to see students' subjective psychologies—students' "back-stories" for their misbehavior—and try to find other ways to help students meet their goals of doing well and being happy in school.

The Okonofua et al. (2016) empathy training intervention took roughly 30 minutes for teachers to complete and was evaluated in a randomized trial with roughly 35 teachers and 1,200 students. Official records showed that sudents who took a class with treated teachers showed half as many suspensions in school (from 9% of students to 4.5%), and effects generalized beyond the class with the treated teacher. Supporting the model proposed here, previously-suspended students reported that their classrooms were now more respectful when they had a teacher who completed the empathy intervention. That is, students responded to greater respect by following school rules and meriting fewer suspensions (also see Gregory et al., 2016).

Second, Yeager and colleagues (2014; 2017) have tested the hypothesis that an intervention to make an academic interaction with a teacher feel more respectful can reduce disciplinary infractions, even without directly targeting students' misbehavior or teachers' views of students' misbehavior. Cohen and colleagues (1999) developed a technique called "wise feedback" (see Goffman, 1963), in which an authority figure justifies critical feedback on someone's work with an appeal to *high standards* (conveying respect for one's competence

by setting a high bar), accompanied by an *assurance of one's potential to reach the high standards* (conveying respect for one's competence by implying that one can improve and develop) (see Lepper & Woolverton, 2002; Treisman, 1992; see also research on natural mentors, Hurd, Sánchez, Zimmerman, & Caldwell, 2012).

Yeager, Purdie-Vaughns, Garcia, and Cohen evaluated wise feedback in late middle school using a small-sample, double-blind field experiment in two consecutive cohorts of white and African-American youth (Yeager, Purdie-Vaughns, et al., 2014; 2017). Students nearing the end of 7th grade wrote first-draft essays that were critiqued by their social studies teachers, all of whom were white. When essays were returned, they were accompanied by randomly-assigned notes, hand-written in advance by their teachers. Half received a *control* note ("I'm giving you these comments so that you'll have feedback on your paper") and half received a *wise feedback* note ("I'm giving you these comments because I have very high expectations and I know that you can reach them").

Yeager et al. (2014) expected that wise feedback would be most effective for African-American youth, who, surveys showed, were more likely to have experienced disrespect as a result of either negative stereotypes and to have been subjected to inequitable discipline, relative to their white peers. The experiment was replicated across two cohorts in the same classrooms. In the first cohort (N=44), the randomly-assigned wise feedback note, as compared to the control note, increased African-American students' willingness to revise the essay from 17% to 72% (covariate-adjusted values; Yeager, Purdie-Vaughns, et al., 2014, Study 1). In the second cohort (N=44, Study 2), the note increased the scores on the revisions, when everyone was required to revise. In both cohorts, treatment effects were small and non-significant for white students. Supporting our model, the wise feedback note most strongly changed behavior and feelings of being respected by teachers in general among those African-American students who over the previous two years had felt disrespected—i.e., who repeatedly disagreed that "teachers and other adults treat me with respect" (Yeager et al. 2014).

Critically, Yeager et al. (2017) next found that, over a year later, the wise feedback note resulted in a reduction in discipline problems for African-American students, even though students had moved on from the teachers who delivered the wise feedback. That is, averaging across the two cohorts, African-American students in the group who received the wise feedback note in the spring of 7th grade showed fewer 8th grade discipline incidents across all classes, halving the discipline gap (Yeager, Purdie-Vaughns, Hooper, & Cohen, 2017). As in the short-term results, there were no benefits for white students, who were also far less likely to be disciplined. See Figure 3.

Discussion—The Okonofua et al. (2016) and Yeager et al. (2017) studies illustrate a few points about adolescent behavior change. First, it is not always necessary to stoke the fire of reactance to achieve adolescent behavior change, as was done in the values-harnessing healthy eating treatment (Bryan et al., 2016) or the truth® campaign (Farrelly et al., 2005). A credible show of dignity and respect, during a period of status-sensitivity, dampened adolescents' feelings of being disrespected by authorities.

Second, the research in this section highlights the importance of relationships with *adults*, not only *peers* (also see research on natural mentors; Hurd et al., 2012). Some research has rightly emphasized adolescents' heightened concern with peers (Chein, Albert, O'Brien, Uckert, & Steinberg, 2011; Crosnoe & McNeely, 2008; Larson & Richards, 1991), and adolescents' tendency to ignore adults' requests to change behavior (Lee, Siegle, Dahl, Hooley, & Silk, 2014). However, adolescents also value the opinions of respected adults and willingly comply under the right conditions (Engelmann, Moore, Capra, & Berns, 2012). Said another way, going through the peer group is not the only way to improve adolescent behavior. Relationships with valued adults can be transformative for young people as well (also see Allen, Moore, & Kuperminc, 1997).

3. Lessening the influence of status and respect threats: The case of high school aggression

Sometimes it will not be possible to use these first two methods (values-harnessing or changing environments), and so a third approach may be useful: lessening the influence of threats to status and respect by changing mindsets. Adolescents should not be oblivious to social threats, of course, but they may benefit from perceiving the threats as less definitive. We illustrate this third approach in the context of high school aggression—an area where, as noted, it has been difficult to identify programs that show average benefits for middle adolescents (Yeager et al., 2015; also see the left column of Table 3).

Our analysis starts with the observation that the threat of losing status or being disrespected may be more influential when it feels diagnostic of a lasting future as a lonely, isolated, dominated, or low-status person. From the perspective of a new high school student, being left out of a party or ridiculed on social media might not only be a temporary inconvenience. It could seem to mean that you will have no friends or be ridiculed for the four years of high school and beyond.

Our research has shown that adolescents' beliefs that people's socially-relevant traits and labels are *fixed* and unchangeable—called an *entity theory of personality*—can predict whether social difficulty makes one feel permanently disrespected (see Yeager, 2017; Yeager & Dweck, 2012; also see Dweck, Chiu, & Hong, 1995; Erdley & Dweck, 1993; Heyman & Dweck, 1998). For example, studies have found that a survey measure of an entity theory of personality predicts adolescents' responses to social adversity. Research participants reporting more of an entity theory also reported greater shame and humiliation when they imagined being excluded or made fun of (Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011).

Fortunately, teaching the belief that traits and labels are *malleable* and have the potential to change—called an *incremental theory of personality*—lessens the influence of social conflict (Yeager, 2017; Yeager, Johnson, et al., 2014; Yeager, Miu, Powers, & Dweck, 2013; Yeager et al., 2011). Incremental theory of personality interventions demonstrate that implicit theories have a causal impact on coping with status and respect threats. Incremental theory interventions teach that people have the potential to change—that, if bad things happen, you are not stuck having a low-status label forever (e.g., as a "loser" or a "victim").

This different worldview can alter the meaning of social events and what emotions social events elicit (Yeager et al., 2011).

Experiments have found that teaching an incremental theory can improve adolescent coping following status and respect threats. An incremental theory of personality intervention has reduced self-reported stress, anxiety, and feelings of threat following negative social evaluation experience that occurred moments after the intervention (e.g. Cyberball exclusion, Yeager, Johnson, et al., 2014, or the Trier Social Stress Test (TSST), Yeager, Lee, & Jamieson, 2016). As one example, high school students receiving the incremental theory showed reduced threat-related cardiovascular responses (lower total peripheral resistance, higher stroke volume) and HPA-axis reactivity (lower cortisol) when they were asked to give a speech about what makes teenagers popular, in front of judgmental, older peers (the TSST; Yeager, Lee, et al., 2016). Similar findings appeared in a study of adolescents with elevated internalizing symptoms (Schleider & Weisz, 2016). Moreover, an incremental theory intervention reduced high school students' salivary cortisol one week later, especially on days when they reported social-evaluative threats (Yeager, Lee, et al., 2016).

More directly relevant to our model, the incremental theory has reduced aggressive retaliation. In one field experiment, conducted by Yeager et al. (2013), facilitators taught the incremental theory of personality through six classroom workshops that employed autonomy-supportive language, opportunities for self-persuasion, and capitalizing on descriptive norms (stories from upper classmen who found the messages helpful) (see Walton, 2014). In a double-blind field trial conducted in 9^{th} and 10^{th}-grade classrooms, the incremental theory intervention was compared to a traditional coping skills intervention that taught the best available content (analogous to interventions meta-analyzed by Durlak et al., 2011), and to a no-treatment control.

In the Yeager et al. (2013) experiment, the coping skills control group did not try to lessen the influence of a status or respect threat by changing its meaning. Instead, like many traditional interventions reviewed earlier, the coping skills control emphasized the need to think positively and not over-generalize from one bad event to one's life in general. These messages were delivered in a respectful way, however—including using descriptive social norms, autonomy-supportive practices, and self-persuasion. The control group's developmentally-attuned delivery mechanism allowed for an unconfounded test of the impact of the message and its delivery.

At one-month follow-up, adolescents in the Yeager et al. (2013) experiment responded to a peer status/respect threat: exclusion in a Cyberball game (Williams & Jarvis, 2006; Williams, Yeager, Cheung, & Choi, 2012). Aggression was measured by allowing participants to allocate unpleasantly spicy hot sauce to a peer who had just excluded them. Adolescent participants (temporarily) believed that the peer disliked hot sauce and would have to consume the entire sample (see Lieberman, Solomon, Greenberg, & McGregor, 1999). (Participants were debriefed afterward).

Adolescents who received the traditional coping skills intervention did not allocate any less hot sauce (i.e., were not any less aggressive) compared to the no-treatment control group.

See Figure 4. What adolescents in the coping skills group learned was not relevant to the *meaning* of a peer status or respect threat, and so it did not change aggressive retaliation (cf. Yeager et al., 2015). Inert content, even when delivered in a respectful way, should not change behavior.

Meanwhile, adolescents who received the incremental theory of personality allocated 40% less hot sauce, representing less aggressive retaliation, as compared to the combined coping skills and no-treatment control groups (Yeager et al., 2013). See Figure 4. The benefits of the intervention for aggressive behavior were confirmed three months post-intervention, when teachers (blind to condition) were more likely to nominate treated students as having improved their behavior, compared to the combined controls (Yeager et al., 2013).

Discussion—Interventions can change the meaning of status and respect threats by implicit theories of personality and thereby lessen the impact of such threats. This approach can be useful in reducing important and undesirable responses to status threats, such as aggression.

More generally, it is not always necessary or advisable for interventions to only help adolescents "win the status game." Sometimes it is desirable to help adolescents feel as though they do not have to play the status game so vigorously.

Is Shorter Always Better?

The effective interventions highlighted here usually required less time from participants than traditional interventions. This could be important to their effectiveness. Stice and colleagues found in two meta-analyses that shorter interventions had stronger effects (Stice et al., 2009, 2006). Perhaps shorter interventions have an easier time maintaining treatment fidelity, or perhaps shorter interventions are less likely to imply to recipients that they are viewed by adults as lacking in competence.

And yet our model does not require that shorter interventions are necessarily preferable. Longer interventions can be attuned to status and respect. For instance, in past studies intervention designers have created multi-session educational workshops that involve a high social status "brand," endorsed by influential peers, in support of the targeted behavior. This has reduced teen smoking and bullying (compare Biglan, Ary, Smolkowski, Duncan, & Black, 2000 and Gordon, Biglan, & Smolkowski, 2008; also see Paluck, Shepherd, & Aronow, 2016 for an example with anti-bullying programs). Programs have also respected adolescents' autonomy and desire to "matter" to others by wrapping psychoeducational content in a relatively long volunteer service program (i.e. the Teen Outreach Program; Allen, Philliber, Herrling, & Kuperminc, 1997). This reduced female teen pregnancy from 9.8% to 4.2%, reduced suspensions from 29% to 13%, and course failure rates from 47% to 27%. (There have been some mixed results from attempts to replicate the Teen Outreach Program, Francis et al., 2016. In four out of the five replications, the control group received key features of the treatment, and in the one replication where this was not true, the Teen Outreach Program benefits were replicated).

One multi-session intervention reduced youth violence: *Becoming a Man* (BAM). Instead of being didactic, BAM used a democratic discussion group (cf. Lewin, Lippitt, & White, 1939) that focused on finding ways besides violence to maintain high status and peer respect, and did so without adults "tell[ing] youth the 'right' thing to do" (Heller et al., 2015, p. 6). BAM reduced arrests among youth of color in Chicago, Illinois by 28–35% and violent crime by 45–50%, and increased high school graduation by 12–19% at long-term follow-up (Heller et al., 2015). In sum, longer, comprehensive interventions are capable of honoring the desire for status and respect and can be effective at promoting positive adolescent behavior change.

Discussion

We have argued that traditional interventions for adolescents often work against adolescents' prioritization of experiences of status and respect, both in terms of *what* those interventions say and *how* they say it (Tables 1–3). Yet adolescents' heightened sensitivity to feelings of status and respect need not thwart adult-delivered interventions. Effective interventions work with those sensitivities and can inspire internalized behavior change.

Our perspective resonates with the Lewinian tension system approach to behavior change (Lewin, 1952). Like Lewin, we emphasize that sometimes it can be easier to achieve behavior change by taking advantage of motives people already have, rather than trying to convince them to have a different source of motivation. In adolescence, effective interventions can make the long-term, healthy choice aligned with short-term feelings of status and respect, rather than trying to make adolescents care about long-term health more than short-term social success.

Our recommendation is consistent with the arguments of many scholars in educational psychology (Eccles, Lord, & Midgley, 1991), developmental neuroscience (Blakemore & Mills, 2014; Crone & Dahl, 2012; Steinberg, 2014; Telzer, 2016), social psychology (Walton, 2014; Wilson, 2011), sociology (Coleman, 1961; Crosnoe, 2011), evolutionary psychology (Ellis et al., 2012), and community psychology (Watts & Flanagan, 2007), who have emphasized the importance of adolescents' social success for motivation and behavior change. What the present analysis adds is an integration of the relevant developmental science of adolescence with the behavioral evidence emerging from intervention experiments.

We have limited ourselves to universal, school-based preventative interventions in three problem areas—unhealthy snacking, school discipline, and peer aggression. However, it will be important to test which aspects of our model apply to other domains. Could direct efforts at status and respect enhancement improve academic motivation? Could it enhance adherence with medical treatments? We are excited to find out.

We are not arguing that adult-delivered interventions represent the *only* method for influencing adolescent behavior. Clearly there is promise in peer networks (e.g., Paluck et al., 2016) or "nudges" that bypass intentional deliberation or habit (e.g., Hanks, Just, Smith, & Wansink, 2012). Furthermore, in some cases, policies that constrain adolescents'

freedoms—like age-graded driver's license policies—can prevent death and injury (see Steinberg, 2015).

Yet the model we present here suggests it would be premature to give up on adult-delivered, school-based universal prevention. Such interventions can play a role in positive youth development, and the alternatives have limitations of their own. Peer social networks can have unpredictable or even harmful effects when peers encourage deviant behavior (see the positive and negative peer acceleration effects in Valente et al., 2007; also see Helms et al. 2014). "Nudge" strategies cannot be effective when one cannot control the environment in which the behavior occurs—as is the case for many of the free-choice behaviors discussed here. Laws that take away rights might prevent risk behavior in the short term, but such laws could also deprive youth of opportunities for learning how to be independent and autonomous in the long term, slowing the transition from child-like status to adult-like status in society (for a philosophical discussion of this issue, see Schapiro, 1999).

We nevertheless are in agreement with the commentators who have challenged the field's prevailing intuitions about the traditional education and skills-based approach to intervention. Our hope is that the present model encourages mechanism-focused research on improved means for creating internalized, lasting positive behavior change for adolescents. Next, we outline several ways that developmental science can push the present framework forward.

From Initial Motivation to Sustained Behavior Change

The model presented here has not yet established the feedback loops through which an intervention that honors the adolescent desire for status and respect might translate into sustained, internalized changes in behavior (though see Fig. 1 in both Yeager, 2017 and Yeager, Purdie-Vaughns, et al., 2017). The question of how time-limited interventions can sustain impact is an emerging topic of investigation in the social and behavioral sciences more generally (Bailey, Duncan, Odgers, & Yu, 2017; Fiske, Frey, & Rogers, 2014; Miller, Dannals, & Zlatev, 2017)

The present analysis can contribute to this discussion in two ways. First, we speculate that *feelings* of respect and status could serve as a gateway to the self—a view that "I am now the kind of person who does this behavior because it makes me feel the way I want to feel"—and therefore create internalization and maintenance of change (see Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008; also see McAdams & Olson, 2010; Oyserman & Destin, 2010).

Second, initial behavior changes, if timely, can open channels into different social environments or formal structures (for a related perspective, see Bailey et al., 2017; Cohen et al., 2017). A seemingly small initial behavior might alter relations with teachers or peers or involvement with extra-curricular activities, which might encourage the behavior further. An initial change in motivation could place one in institutional pathways (like advanced course-taking or out-of-school activities) that create access to adult mentors or other beneficial resources (for an example in sociology, see Frank et al., 2008). Extending the model presented here and explicitly testing the processes for sustained change—both within the

person and between the person and the affordances in the environment—represents an exciting area for innovation.

Advancing a Developmental Science-Based Perspective on Interventions

Future studies can test developmental mechanisms for the differences in responsiveness to the interventions described here. We have focused on the rough labels of "middle adolescence" or "childhood" and considered chronological age or grade level as predictors of developmental trends, due to the state of the evidence. But, as noted, chronological age is imprecise. In fact, anthropological studies of adolescence largely ignore chronological age and focus instead on the milestones of pubertal maturation and adult role acquisition (e.g. Schlegel & Barry III, 1991).

A falsifiable prediction that follows from our framework is that pubertal maturation and testosterone levels (or estradiol, or a combination of these and other pubertal hormones) will predict weaker responsiveness to traditional interventions (see Yeager, Hirschi, et al., 2017). That is, if pubertal maturation causes an increased coupling of motivation to change and status/respect-relevant experiences, then pubertally advanced or higher-testosterone individuals should be more strongly resistant to traditional programs that threaten status or respect. Chronological age, meanwhile, may be a less consistent predictor of variability in treatment impacts, especially during ages with great variability in pubertal timing and tempo.

Our predictions are less clear for status-sensitive interventions. On the one hand, more-mature and higher-testosterone individuals might show greater responsiveness to status-sensitive approaches such as values-harnessing (*a la* Yeager, Hirschi, et al., 2017). On the other hand, early-adolescence (often age 10–13) may prove to be an opportune stage for creating enduring change via status-sensitive interventions. Perhaps early adolescents could be taught the notion that healthy behavior is high-status, and this association might be intensified by pubertal maturation.

Comparisons to Children and Adults

We are not arguing that status and respect only matter to adolescents and do not matter for children or adults. Even young children can be attuned to status (Rizzo & Killen, 2016) and both children and adults are motivated by the opportunity for self-determination (see Ryan & Deci, 2000). Instead, we argue that during middle-adolescence, three things come together: a new meaning of taking away choice or undermining competence (that it violates status and respect), the high likelihood of being treated like a child (which violates status and respect), and the motivational prioritization of feelings related to status and respect.

Many of the universal preventative interventions we discuss here may also simply be less relevant at later ages. Problem behaviors have often already begun—or not—by middle adolescence. For instance, almost no one starts smoking for the first time as an adult, and motivating adults to get a GED does not benefit wages like an on-time high school degree does (Heckman et al., 2014). Once the school-to-prison pipeline has given one a criminal record or exposed one to deviant peers, the damage is difficult to undo (Heitzeg, 2009).

Furthermore, universal interventions can be easier to deliver during middle adolescence. Before age 17, young people are required by law to be in school, so societies can give beneficial messages to almost entire cohorts of young people. Hence, even if the psychological processes described here remain present in adulthood, it is still critical to study them among adolescents.

Program Evaluation Research

Last, we see many opportunities for the proposed model to inform program evaluation research. For decades, researchers have focused primarily on whether a program evaluated in a randomized-controlled-trial shows main effects. Yet, as null treatment effects of interventions have become more the rule than the exception, researchers have begun to prioritize the study of treatment heterogeneity, defined as the differential effectiveness of interventions across individuals, contexts, or program implementations (Bryk, 2009; Gelman, 2014; Hulleman & Cordray, 2009; Weiss, Bloom, & Brock, 2014). Might students' reports of whether or not the program made them feel respected predict heterogeneity in intervention effect sizes? Future evaluations studies could find out.

Conclusion

Our perspective has been that when adults honor adolescents' sensitivity to feeling high status and respected, we may find that adolescents show far greater self-regulation, ability to think about the future, and capacity to change than we imagined. The present article provides the beginning of a roadmap for tapping into this powerful source of motivation—one that might result in improvements to both developmental science and societal welfare.

Acknowledgments

This paper was supported by the Raikes Foundation, the William T. Grant Foundation, the National Institute of Child Health and Human Development under award number R01HD084772, and a fellowship from the Center for Advanced Study in the Behavioral Sciences (CASBS). The content does not necessarily represent the official view of the National Institutes of Health. This research benefitted from conversations with or feedback from: Kenneth Barron, Christopher Bryan, Charles Carver, Geoffrey Cohen, Robert Crosnoe, Christopher Hulleman, Jenann Ismael, Robert Josephs, Margaret Levi, Todd Rogers, Daniel Schwartz and the Schwartz Lab, Ahna Suleiman, Sander Thomaes, Gregory Walton, Timothy Wilson, Zoe Stemm-Calderon, the Social-Personality and Developmental areas at the University of Texas at Austin, and the Clinical Excellence Research Center at Stanford University.

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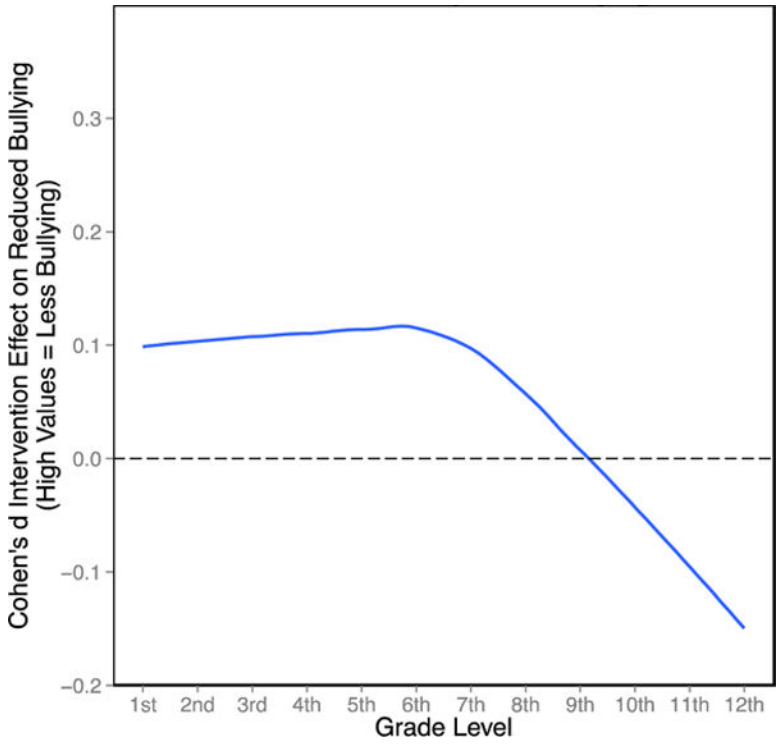

Figure 1.

Moderation of school-based bullying prevention program effects (Cohen's *d*) by grade level in school (Yeager et al., 2015). Estimated values from three-level meta-analysis. Higher values correspond to more beneficial effect sizes. Grade levels on the U.S. scale.

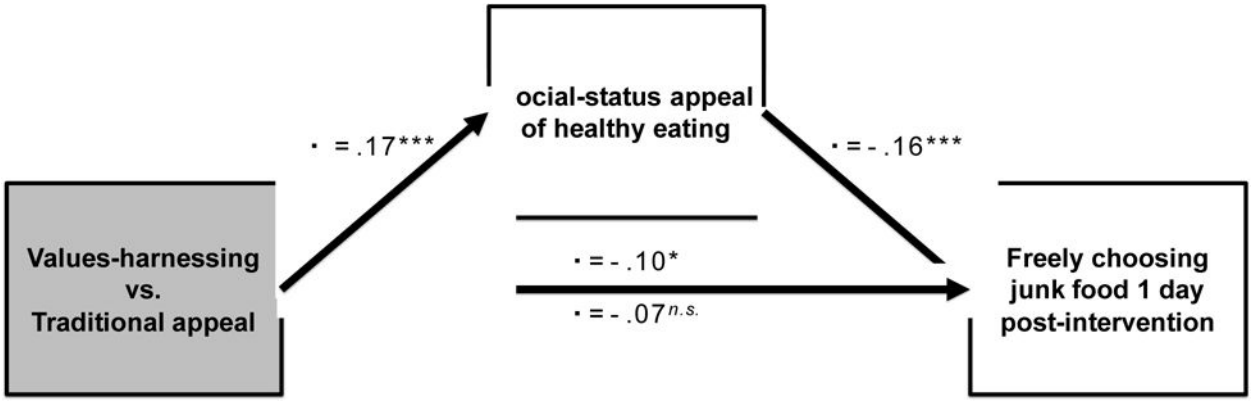

Figure 2. A healthy eating intervention creates high social-status appeal and changes free-choice behavior. Standardized regression coefficients. * *p*<.05, ***p*<.001, *N*=468

Source: Bryan et al. (2016). *c* path above the line is the unconditional direct effect; the path below the line is the *c*' path in a model that accounts for the effect of the mediator.

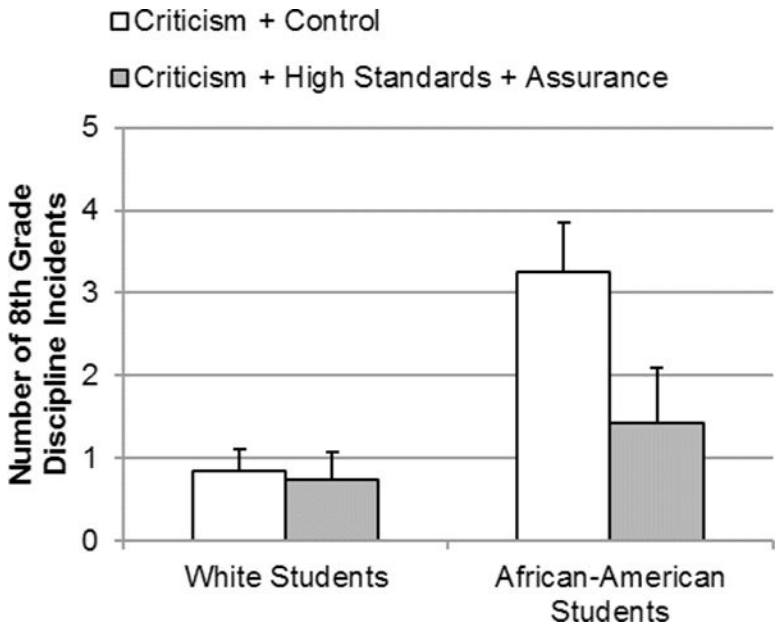

Figure 3. Effect of a hand-written wise feedback note (conveying high standards + assurance) from a social studies teacher in spring of 7th grade on discipline incidents one-year post-intervention, in 8th grade, by student racial group. *N*=88. Raw values. Bars represent one standard error of the mean

Source: Yeager, Purdie-Vaughns, Hooper, & Cohen (2017).

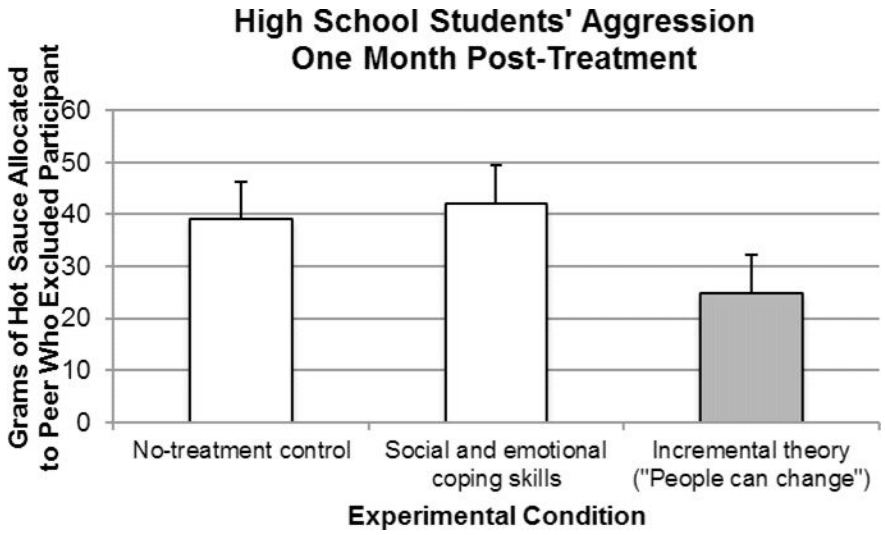

Figure 4. Changing the meaning of a threat to status/respect reduced aggression for high school adolescents, whereas a traditional anti-aggression intervention that taught coping skills did not. Bars respresent 1 standard error of the mean

Source: Yeager, Trzesniewski, and Dweck (2013).

Table 1

Programs to Promote Healthy Eating

	Common features of traditional interventions	An intervention that harnesses the desire for status and respect
What they say	• This is how your body processes unhealthy foods • Eating healthy (and avoiding junk) now will make your body healthier later when you are older	• Food companies pay scientists to make junk food addictive to children's brains • Companies hired former tobacco executives to market addictive junk to children and poor people • Those executives won't let their own children eat the junk food • Every time you buy junk food you give money to rich people who think you don't know any better
How they say it	• Classroom lectures from teachers • Whole-school assemblies • Colorful diagrams or videos • Skits and role plays • Parent training, so kids get the message at home • Homework	• Exposé of harmful food industry practices • Quotes from outraged high-status upperclassmen who vowed to change their habits • Writing a persuasive essay to future students

Note: Common features of traditional interventions abridged from descriptions of materials often disseminated in schools (Let's Move, 2017) or described in past meta-analyses (Stice et al., 2006).

Table 2

School Discipline Interventions

	Common features of traditional interventions (e.g., zero-tolerance)	An approach that increases displays of respect from authorities
What they say	• We have zero tolerance for misbehavior • Any misbehavior will be met with harsh punishment • Punishments for repeat offenses will escalate	• There is the high standard for behavior and achievement here; • We believe you have the potential to meet this standard • If you make mistakes, it's part of the learning process • Here is how we plan to support you as we work together to meet this high standard
How they say it	• Clearly communicating prohibitions (e.g. "no fighting" signs on the walls) • Systems for accounting for bad behavior (e.g., demerit systems, token economies) • Vigilant supervision by in-school police officers, hall monitors, etc.	• Creating a context of respect with multiple adults, in which adults know students' core values and are empathic about underlying causes of behavior • Procedural justice: fair application of rules • Opportunities to learn and grow after mistakes

Note: Common features of zero tolerance interventions abridged from published descriptions of programs (American Psychological Association Zero Tolerance Task Force, 2008; Heitzeg, 2009)

Table 3

Interventions to Reduce High School Aggression

	Common Features of Traditional interventions	An intervention that lessens the influence of a threat to status or respect
What they say	• Bullying and aggression are not allowed • You should not be mean, call people names, hit people, exclude people, or start rumors about people • If those things happen to you, you should think positively and use positive coping skills	• People have the potential to change themselves or their social places in life; • Therefore people are not stuck being one kind of person—a loser or a bully;
How they say it	• Classroom lectures from teachers • Online activities to reinforce the message • Whole-school assemblies • Token economies for good behavior • Skits and role plays • Parent training, so kids get the message at home • Homework	• Stories of formerly-aggressive people or shy people who learned other ways to be; • Scientific evidence for how this was possible, drawing on neuroscience and field experimentation; • Stories from peers who found this information helpful; • Self-persuasion writing exercises

Note: Common features of traditional interventions abridged from descriptions of programs in past meta-analyses (e.g., Yeager et al., 2015)