FOSTERING MARGINALIZED YOUTHS' ACADEMIC ACHIEVEMENT AND CRITICAL CONSCIOUSNESS THROUGH A VALUES-AFFIRMATION INTERVENTION

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ABSTRACT

FOSTERING MARGINALIZED YOUTHS' ACADEMIC ACHIEVEMENT AND CRITICAL CONSCIOUSNESS THROUGH A VALUES-AFFIRMATION INTERVENTION

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Significant scholarly attention has recently been directed to the use of social-psychological interventions—designed to influence the way students perceive themselves within school—to bolster academic performance and close persistent racial-ethnic achievement gaps. While these brief, carefully designed interventions benefit targeted participants, they do very little to change the contexts that threaten their development. Through this dissertation, I explore how an adapted social-psychological intervention may enhance academic achievement *while also shaping participants' capacity to change their contexts,* via the development of critical consciousness (CC).

This project integrates social psychology and CC literatures to examine if a values-affirmation social-psychological intervention can raise students' academic achievement while also fostering CC simultaneously. Two overarching research questions guide this project: Research Question 1: *Can a CC values-affirmation intervention bolster students' academic performance?* and Research Question 2: *Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?* Participants in this field experiment included 53 ninth and tenth grade students from public charter high schools in the Midwestern United States (M_{age} = 14.97). Participants were randomly assigned to one of two study conditions at the individual student level, the no-affirmation condition and the affirmation condition.

The results of this study show promise in the use of a CC-oriented values-affirmation

intervention to enhance students' academic performance and foster CC simultaneously. Specifically, trend-level evidence suggested the intervention may have bolstered academic performance and raised levels of CC, or critical motivation in particular. The moderate effect sizes for GPA (d = .54) and for critical motivation (d = .56) outcomes suggested that the intervention was associated with increased academic performance and CC, though the non-normal distributions of these outcome variables suggested additional evidence was needed to substantiate this interpretation. Distributional differences in GPA and critical motivation, tested via independent samples Mann-Whitney U tests, were significant, which confirmed that the intervention may indeed have some positive effects in terms of raising participants' academic performance and level of CC.

Differences in *critical reflection: perceived inequality*, *critical reflection: egalitarianism*, and *critical action: sociopolitical participation* were non-significant, providing no evidence of intervention effects on these components of CC; however, these analyses may have been underpowered due to the small analytic sample used in the study. Ultimately, this field experiment holds implications for the fostering of CC, generally believed to be a slow and time-intensive process and suggests that it may be possible to utilize a values-affirmation intervention to bolster academic achievement and raise CC simultaneously.

Keywords: academic achievement, critical consciousness, intervention, stereotype threat, values affirmation

In Memory of
Robert Keith Rapa
who taught me, by example, much of what it means to be
a father, a husband, and a scholar

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CHAPTER ONE

Introduction

Significant scholarly attention has recently been directed to the use of social-psychological interventions—activities designed to influence students' self-construals within school—to bolster academic performance and close persistent racial-ethnic achievement gaps. These achievement gaps, once on the decline, have been widening (Lee, 2002) and are now similar to those of 20 to 30 years ago (Boykin & Noguera, 2011). This is a complex and multifaceted social problem, with far-reaching consequences for both individuals and American society as a whole (McKown, 2013).

Through a series of field experiments, brief and carefully designed social-psychological interventions have been shown to support academic achievement and significantly reduce achievement gaps (Yeager & Walton, 2011), garnering a significant amount of scholarly, policy, and public attention. For example, G. L. Cohen, Garcia, Apfel, and Master (2006) found that one form of social-psychological intervention, a brief values-affirmation writing exercise, buffered against the effects of stereotype-based identity threats and led to improved academic performance by African American students in seventh grade, reducing the racial achievement gap by 40 percent. A stereotype-based identity threat may be, for example, the fear that poor performance will confirm a negative stereotype about one's self or group or the fear that one may be evaluated or judged poorly as a result of such a stereotype (Steele, Spencer, & Aronson, 2002). A series of supplemental writing exercises sustained these effects for two years (G. L. Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009). Similarly, a social-psychological intervention used a reflective 1-hour writing exercise targeting students' sense of belonging as they transitioned to college, and this intervention reduced by half the achievement gap between

Black and White students (Walton & Cohen, 2011).

These studies reflect one major thrust of social-psychological interventions used in schools—targeting the effects of stereotype and other social identity threats through self-affirmation or exercises targeting students' belonging and attributions (Yeager & Walton, 2011). Self-affirmation interventions, in particular, have the potential to buffer against social identity threats because they alter individual's self-construal, reorienting self-perception and enhancing the self-resources needed to cope with threat. The results of social psychological interventions suggest great promise, in that such interventions have been shown to buffer the effects of identity threats, mitigating hazards to students' identity and bolstering their performance and sense of belonging within the school environment. However, although these interventions have clear benefits—namely, enhanced academic performance for targeted participants and reductions in racial-ethnic achievement gaps—they do not implicitly change the contexts in which participants are situated.[1]

Fostering critical consciousness (CC) is an important way to help marginalized students—those experiencing social identity threats in school—navigate their social conditions and contend with the structural constraints faced in school—and perhaps elsewhere. CC represents people's critical analysis of their social conditions and the action they take to change inequities within their contexts (Freire, 1973; Watts, Diemer, & Voight, 2011). Moreover, CC operates as an "antidote" to structural oppression, fostering agency and empowerment to improve social conditions, eradicate oppression and marginalization, and transform inequitable social environments (Watts, Griffith, & Abdul-Adil, 1999).

[1] In social sciences research, the word 'context' has a range of meanings and can include different environments salient to youths' development. My use, here and throughout, refers specifically to adolescents' home, neighborhood, and school contexts.
[2] Notably, a few other scales designed to measure CC emerged simultaneously with the CCS (Baker & Brookins, 2014; McWhirter & McWhirter, 2015; Thomas et al., 2014). See Diemer et al., 2015 for a review.
[3] Although following study participants longitudinally was not a part of this dissertation project (as a result of

Through this project, I aim to explore how a social-psychological intervention may enhance academic achievement *while also shaping participants' capacity to change their contexts,* via the development of CC. Specifically, I examine if a 'values-affirmation' social-psychological intervention can be used to raise marginalized students' academic achievement and foster CC simultaneously.

Theoretical Framework

Stereotype threat represents the concern that an individual feels when he or she perceives it is possible to confirm a negative stereotype about one's group (Steele & Aronson, 1995). Stereotype threat interferes with the academic performance of African American, Latino/a, and other stereotyped individuals (e.g., women in STEM courses or areas of study), reducing achievement on specific academic tasks or standardized tests (Walton & Spencer, 2009) and potentially leading to reduced motivation, disengagement, or disidentification from the academic domain (Steele et al., 2002). Stereotype threat inhibits performance by raising concerns about how one might be perceived or casting doubts about one's ability, enhancing stress and anxiety, potentially interfering with working memory and problem solving, and increasing cognitive load (Carr & Steele, 2009).

In school, identity threats encountered as a result of negative stereotypes can become chronic, when situational manifestations of stereotype threat recur regularly and where the evaluative pressures of school are constant (G. L. Cohen et al., 2009; Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Hanselman, Bruch, Gamoran, & Borman, 2014). Chronic identity threats, in turn, can lead to perceptions that one does not belong in school (G. L. Cohen & Garcia, 2008) as well as promote increased sensitivity to teacher bias and heightened awareness of threat in general (Cook et al., 2012; Yeager et al., 2013).

Chronic threat environments affect students' identities, both by threatening their perceived self-worth and by raising awareness of the potential devaluation of one's group identity (Garcia & Cohen, 2012). Values-affirmation interventions that tap into students' identities and help adjust their subjective self-construals within a threatening environment have the potential to mitigate both situational and chronic threats, in that they provide immediate resources to cope with threat while also setting in motion recursive processes that promote enhanced self-perception and performance over time (G. L. Cohen et al., 2009).

In their recent review of the field, Yeager and Walton (2011) catalogued two major types of social-psychological interventions used in educational settings: those targeting students' attributions for academic challenges and those targeting the effects of stereotype threat. Interventions addressing the former have shown that students' attributions for failure in school can be adjusted, so that beliefs about poor performance are credited to temporary rather than permanent causes, for example by engendering growth mindsets and promoting incremental views rather than entity views of intelligence (Dweck, 2006; Yeager et al., 2016; Yeager & Walton, 2011). Interventions addressing the latter, those undertaken to buffer against stereotype threat, have been shown to mitigate the effects of threats to students' identity and sense of belonging in school.

Values-affirmation interventions are an example of this latter kind of social-psychological intervention, and values affirmation represents an often-used strategy within the field (McQueen & Klein, 2006; Yeager & Walton, 2011). Grounded in self-affirmation theory (Steele, 1988), interventions of this type are framed by the notion that people in threatening environments seek to maintain a sense of self by engaging an ego-protective system that keeps one's self-integrity intact. Self-integrity, according to Steele's self-affirmation theory, means the maintenance of a

strong and positive sense of self, one that is "adaptively and morally adequate" or "competent, good, coherent, unitary, stable, capable of free choice, [and] capable of controlling important outcomes" (p. 262). In school, when identity threats are present, students may become distracted by worry that their academic performance will confirm negative stereotypes about their intellectual performance or that of their racial-ethnic group (Shapiro & Neuberg, 2007; Steele & Aronson, 1995; Taylor & Walton, 2011). This can lead to decreased academic performance and set in motion vicious cycles that lead to lower levels of learning and engagement and eventual disidentification from school.

Psychologically, values-affirmation interventions are effective because they can initiate processes that stop vicious, recursive cycles that reinforce negative performance trajectories and promote more virtuous ones (G. L. Cohen et al., 2009). As Yeager and Walton (2011) have noted, "It is by affecting self-reinforcing recursive processes that psychological interventions can cause lasting improvements in motivation and achievement even when the original treatment message has faded in silence" (p. 275). These processes afford intervention participants greater resources to cope with threat, provide an opportunity to adjust their perspective about the danger of threat (e.g., recognize, consciously or unconsciously, that self-worth is derived from identity markers other than the one under threat), or even help them recognize and acknowledge threat, facing it head-on but without depleting individuals' sense of self-integrity or well-being (Sherman & Hartson, 2011; Shnabel, Purdie-Vaughns, Cook, Garcia, & Cohen, 2013). Ultimately, through values-affirmation, one's sense of self can be influenced so it is less contingent upon environmental cues but rather is more independent of them (Cook et al., 2012). For youth in school, this not only has the potential to increase academic performance within their immediate context, but also to initiate or "kick start" processes that contribute to increased

achievement outcomes over time (G. L. Cohen et al., 2009; Yeager & Walton, 2011).

Usually, values-affirmation interventions do not directly address identity features that are stereotyped, instead targeting disconnected (if not benign or generic) aspects of identity in order to buffer adverse impacts of identity threats (Sherman et al., 2009; Steele, 1988). Typical values-affirmation interventions entail a control condition in which non-treated participants reflect on a list of values and then report about why some of those values might be important to someone else. The treatment condition generally calls for treated participants to reflect on the same list of values, but then asks them to report on why a few of the values are important to them, as individuals (McQueen & Klein, 2006). The exercise is self-affirming for those in the treatment condition because it allows respondents the opportunity to identify an aspect of their identity that is central to them and their self-perception. Reflecting on why that value is important to them and who they are bolsters their self-integrity and sense-of-self, and thus releases them from the evaluative pressure of perceived threats. In these interventions, the values identified by the affirmed participants are unrelated to, or direct attention away from, the identity under threat; this is based on the theoretical premise—and empirical evidence—that self-affirmation in one domain or component of identity effectively enhances one's ability to deal with threats experienced in other domains (G. L. Cohen et al., 2006; Sherman & Cohen, 2006; Steele, 1988).

An open question is whether interventions that directly challenge domains being stereotyped or marginalized may be equally effective (McQueen & Klein, 2006). Some individuals may benefit from more direct self-affirmation in response to the identity threats that manifest within their immediate context. In this way, the specific content of values-affirmation interventions—that is, what they draw attention to and what they do not draw attention to—may play a role in an intervention's effectiveness (see Shnabel et al., 2013 for related discussion). Yet

values-affirmation interventions have generally targeted identity-neutral characteristics instead of targeting the identity characteristics that are under threat.

A values-affirmation intervention targeting CC-related values provides an opportunity to examine this explicitly. Moreover, the potential for a values-affirmation intervention to foster achievement and CC simultaneously stems from Steele's (1988) proposition that individuals under threat need to preserve their self-integrity and feel "capable of controlling important outcomes" (p. 262). Theoretically, CC is a means by which people come to recognize inequities within their social context and develop agency to influence important outcomes (Diemer, Rapa, Park, & Perry, in press). CC has been associated with a host of adaptive outcomes for adolescents, including academic achievement and engagement (Carter Andrews, 2008; O'Connor, 1997; Ramos-Zayas, 2003), career development (Diemer & Blustein, 2006; Diemer et al., 2010), occupational attainment (Diemer, 2009), healthier sexual decision-making (Campbell & MacPhail, 2002) and mental health (Zimmerman, Ramírez-Valles, & Maton, 1999), and civic engagement (Diemer & Li, 2011; Diemer & Rapa, 2016). In short, CC equips marginalized youth to negotiate structural constraints and develop the capacity to succeed in educational, occupational, and social contexts.

Two aspects of CC have been conceptualized as *critical reflection* and *critical action* (Prilleltensky, 2012; Watts et al., 2011), where critical reflection represents the analysis of structural inequalities (e.g., constraints on educational and occupational opportunity due to racial-ethnic, gendered, and socioeconomic inequalities) and critical action represents individual or collective action taken to redress perceived inequalities. Instrument validation provides construct validity evidence for this conception of CC (Diemer, Rapa, Park, et al., in press; McWhirter & McWhirter, 2015). Scholars have also argued that *critical motivation* (sometimes

called “political efficacy”) may be another distinct component of CC (Watts et al., 2011, p. 45), representing an individual’s perceived ability and commitment to confront societal inequalities and produce sociopolitical change. Critical motivation is hypothesized to be an intermediate step between critical reflection and critical action (Watts et al., 2011), with the relationship between critical action and critical reflection being reciprocal (Freire, 2000). Critical reflection gives rise to critical action, and critical action, in turn, gives rise to enhanced critical reflection.

While CC has been associated with adaptive educational and occupational outcomes, most empirical CC research has focused on exploring its contextual antecedents or consequences rather than testing how it develops. Emergent research has highlighted approaches typically used to foster CC (Watts & Hipolito-Delgado, 2015), yet we still have much to learn about how to promote CC (Godfrey & Grayman, 2014). Moreover, there has been virtually no experimental research on its development (for an exception, see Chronister & McWhirter, 2006).

Social-psychological interventions adjust subjective self-construals within threatening environments (Yeager & Walton, 2011), and CC plays a role in engendering feelings of agency in the face of structural constraints. Self-reflection on CC-related values should provide marginalized youth—those subject to chronic social identity threats within the school environment—with the opportunity to affirm salient aspects of their identity while also allowing them the opportunity to critically reflect on their social conditions, promoting agency and compelling them toward action to redress societal inequities. That is, a CC-oriented values-affirmation intervention should not only accomplish the goal of self-affirmation, and thereby contribute to gains in academic achievement and reductions to the racial achievement gap, but should also contribute to the development of CC at the same time.

Summary

This dissertation explores how an adapted social-psychological intervention might enhance academic achievement while also shaping participants' capacity to change their contexts, via the development of CC. Two overarching research questions guide this project: Research Question 1: *Can a CC values-affirmation intervention bolster students' academic performance?* and Research Question 2: *Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?* These questions are addressed through analyses of post-intervention group differences across two study conditions, a control group and a treatment group.

In Chapter 2, I review the literatures that undergird the theoretical foundation of this project, including self-affirmation, stereotype threat, and CC. In Chapter 3, I describe the methods used in this study, from initial pilot test to the full-scale values-affirmation intervention. Details are provided about the study's research design, participants, procedures, and data analyses. Results of the pilot study, which was conducted to validate the intervention materials that were designed for use in the full-scale study, are presented as well.

In Chapter 4, I present the results of the full-scale CC values-affirmation intervention study. Specifically, I provide an overview of the statistical analyses used to address the study's two research questions and then delineate the results of those analyses in light of those research questions. I conclude Chapter 4 with a discussion of the results of the CC values-affirmation intervention.

In Chapter 5, I assess the implications of the CC values-affirmation intervention and enumerate the limitations of this research project. I conclude by outlining a few steps necessary for me to extend this research and offering a few suggestions for other researchers interested in

adapting social-psychological interventions to test whether and how academic achievement and CC might be developed simultaneously through values-affirmation. I conclude by suggesting that this field experiment holds implications for fostering of CC, which has generally been thought to have a slow and time-intensive growth process and argue that, through this intervention, it may be possible to utilize a values-affirmation intervention to bolster academic achievement and raise CC simultaneously.

CHAPTER TWO

Self-Affirmation, Stereotype Threat, and Critical Consciousness: A Review of the Literature

Self-Affirmation, Stereotype Threat, and Critical Consciousness

Self-affirmation

Self-affirmation theory (Steele, 1988) is the foundation of values-affirmation intervention research. According to self-affirmation theory, when individuals encounter psychologically threatening situations or find themselves within threatening environments, an ego-protective system is activated in order to "affirm an overall self-concept of worth after it has been threatened" (p. 266). Self-affirmation theory posits that threats in one domain can be compensated for by affirmation of the self in other domains; in this way, the system that works to preserve self-integrity is flexible and dynamic (Sherman & Cohen, 2006).

Self-affirmation theory maintains that one's self-integrity can be reinforced via reflection on qualities or values that are believed to represent the self or are otherwise important. "Those qualities that are central to how people see themselves are potential domains of self-affirmation" (Sherman & Cohen, 2006, p. 189). The reflection on qualities or values that represent the self, or are important to how one sees himself or herself, bolsters one's sense of self in the face of situational or environmental threats.

Stereotype Threat

One type of situational or environmental threat is referred to as "stereotype threat." Stereotype threat relates to an individual's perception that he or she may confirm a negative stereotype about one's self or one's group. According to Steele et al. (2002), stereotype threat can be defined as follows:

> When a negative stereotype about a group that one is part of becomes personally relevant, usually as an interpretation of one's behavior or an experience one is having, stereotype threat is the resulting sense that one can then be judged or treated in terms of the stereotype or that one might do something that would inadvertently confirm it. (p. 389)

Stereotype threat is generally considered to be situational, in that it arises as a result of the interaction between an individual's environment and context-embedded cues suggesting that a negative stereotype may be relevant. In other words, the threat an individual feels within his or her environment is linked to the importance or meaning or importance of the domain as well as one's identification with the domain to which the stereotype applies (Steele et al., 2002). For example, seminal research exploring stereotype threat showed that test performance of African American students was lower than their White counterparts only when the test was purported to be diagnostic of ability but not when the same test was presented as non-diagnostic (Steele & Aronson, 1995). Similar findings about the effects of stereotype threat have emerged when tested with Latino university students, with middle school students, and with women in mathematics fields (Steele et al., 2002). Finally, similar results emerged when testing the effects of stereotype threat for White males in the field of mathematics, when compared to their Asian counterparts (Aronson et al., 1999).

A vast body of research indicates that stereotype threat inhibits academic performance and achievement. There are various mechanisms by which performance may be inhibited. For example, stereotype threat raises stress and anxiety levels, interferes with working memory and problem solving skills, and increases cognitive load (Carr & Steele, 2009). Stereotype threat also prompts negative emotion regulation and promotes a focus on prevention with regard to the

negative stereotype, whereby the stereotyped individual dedicates cognitive and emotional resources toward trying to avoid the confirmation of the negative stereotype (Taylor & Walton, 2011; Walton & Spencer, 2009).

Psychological reactions to stereotype threat often play out as quick, short-term responses by those who are experiencing the threat. Domain avoidance, self-handicapping, working to disprove the relevance of the stereotype, and disengagement are all short-term reactions to stereotype threat (Steele et al., 2002).

Stereotype Threat as a *Chronic* Threat. While stereotype threat is generally considered to be a situational threat that affects students' performance within a particular academic context, at a specific point in time, stereotype threat can function as a *chronic* threat as well—i.e., as part of an environment where exposure and evaluation occur continually and over an extended period of time. For example, Cook et al. (2012) argued that stereotype threat in school can recur to create a "chronically stressful environment" where "critical feedback, low grades, and real or perceived slights" are experienced continually (p. 1).

When stereotype threat becomes chronic and is experienced continually within a domain, it has the potential to lead to psychological defenses that are chronic as well. Disidentification is one such response. When one disengages from a domain, it is possible that he or she still identifies with that domain (e.g., "I am disengaged from my math studies, but I still see myself as a 'math person'"). When responding through disidentification, on the other hand, one distances his or her views of self from performance within that domain (e.g., "proficiency in mathematics is not important to me, and I no longer see myself as a 'math person'") and maintains this separation over the longer-term (Steele et al., 2002). According to stereotype threat theory, stereotype threat only operates when a domain being stereotyped is personally relevant to the

stereotyped person; therefore, disidentification from the domain where threat occurs is one way to mitigate the effects of stereotype threat. Initial shorter-term responses to stereotype threat can ultimately lead to chronic defenses when exposure itself is more chronic in nature. For example, some students who experience persistent stereotype threat in schools, such as African American or Latino/a youth, may disidentify with school or the academic domain in order to preserve their sense of self and remove the adverse impacts of stereotype threat (Steele et al., 2002).

Mitigating Stereotype Threat through a Values-Affirmation Intervention. Social-psychological interventions have been used effectively to buffer against the effects of acute or chronic stereotype threat. More specifically, social-psychological *values-affirmation* interventions have been used effectively to mitigate the effects of stereotype threat within educational settings (Yeager & Walton, 2011). In their landmark study, G. L. Cohen et al. (2006) found that a brief 20-minute values-affirmation intervention improved targeted 7th grade students' grade point averages by 0.30 grade points, reducing the achievement gap between Black and White students by approximately 40% in just one semester.

In this intervention, students in the treatment condition were provided a prompt asking them to identify values that were personally meaningful and describe a time when these values were important to them. Students in the control condition were provided a similar prompt asking them to identify values that were not meaningful to them, but which may be important to someone else, and describe a time when those values might be important to someone else.

In a follow-up study, G. L. Cohen et al. (2009) found these effects to persist over the course of two years, with a grade point average increase of 0.24 grade points for African American students. The intervention was particularly effective for lower-performing African American students, who had an average grade point average increase of 0.41 grade points at the

conclusion of the two-year follow up study.

Values-affirmation interventions are effective at buffering against the effects of stereotype threat as a result of three inter-related processes (Sherman & Hartson, 2011). First, self-affirmation enhances self-resources that one has available to cope with the perceived threat. Second, with enhanced self-resources available, one can view perceived threat within a broader context or from a broader perspective—that is, those threatened become less worried about the effects of the threat on their self-image. In this way, their level of "construal" of the threat shifts, and the threat is situated within a broader context. Seeing threat within this broader context enables the individual experiencing threat to decouple the experience of threat within a given context or domain from their self-evaluation, thereby reducing the threat's potential to negatively impact the individual experiencing threat. Sherman and Cohen (2006) put it this way: "When self-affirmed, individuals feel as though the task of proving their worth, both to themselves and others, is 'settled.' As a consequence, they can focus on other salient demands in the situation beyond ego protection" (p. 189). To illustrate, a student who engages in self-affirmation by reflecting on *creativity* or *independence* as a salient aspect of his or her identity becomes less concerned about another's evaluation of him or her based on demonstrated performance of a certain level on an academic task or test (i.e., strong performance on a math exam). Instead, that student has an affirmed sense-of-self due to his or her self-reflection on being a creative person—and performance on the math exam becomes less relevant to his or her self-worth. In brief, self-affirmation enhances self-resources so threatened individuals can cope with threat, equips those under threat with a broader context in which threat can be situated, and provides the opportunity to decouple self-evaluation—or one's self-integrity (Steele, 1988)—from the context or domain where the threat is experienced.

Self-affirmation has not only been shown to be effective at mitigating the effects of stereotype threat in the short term, but its effects have also been shown to persist over time. People who are insulated against identity threats neither feel situational anxiety in stereotyped domains, nor do they feel the need to disidentify from school to protect themselves (Steele et al., 2002). Self-affirmation has appreciable effects over time because it arrests negative performance trajectories and promotes more positive ones (G. L. Cohen et al., 2009), and because it shifts threatened individuals construal of poor performance (Sherman & Hartson, 2011).

Critical Consciousness (CC)

Defining CC. CC represents people's critical analysis of their social conditions and the action they take to change perceived inequities (Freire, 1973; Watts et al., 2011). Paulo Freire (2000) initially defined CC as "learning to perceive social, political, and economic contradictions, and to take action against the oppressive elements of reality" (p. 35). He conceptualized CC as a way to help marginalized Brazilian peasants develop literacy skills while also developing the capacity to think critically about inequitable social conditions and take action to change them.

Two aspects of CC have been conceptualized as *critical reflection* and *critical action* (Prilleltensky, 2012; Watts et al., 2011). Critical reflection represents the analysis of structural inequality in the form of racial-ethnic, gendered, and socioeconomic constraints on educational and occupational opportunity, while critical action represents action taken, individually or collectively, to redress perceived inequalities. Recent scholarship has validated these as components of CC (Diemer, Rapa, Park, et al., in press; McWhirter & McWhirter, 2015). Critical motivation is a theorized but unverified third component of CC, presumably operating as an intermediary between critical reflection and critical action. That is, critical motivation

represents the agency to act to address perceived inequality, growing out of critical reflection and leading to critical action (Watts et al., 2011).

Marginalization takes various forms, and the intersectionality that results from having various social identity markers may mean that people hold more (or less) marginalized or privileged identity statuses within and across different domains (Diemer, Rapa, Voight, & McWhirter, in press). That is, people may have different levels of CC relative to the distinct kinds of marginalization and social inequality that they experience. While CC may manifest differently for different individuals, it may thus be relevant for White youth and along with youth of color, depending on their manifold social identity statuses and the degree to which they experience marginalization across various domains. Moreover, for those individuals with more privileged identity statuses, it may be that CC does not develop relative to their own marginalization or oppression, per se, but rather develops in terms of the marginalization and oppression of others (Diemer, Rapa, Voight, et al., in press).

Relations between CC and Adaptive Outcomes. CC has been associated with a number of adaptive outcomes for marginalized adolescents, including academic achievement and engagement (Carter Andrews, 2008; O'Connor, 1997; Ramos-Zayas, 2003), connection to career expectations (Diemer et al., 2010) and attainment (Diemer, 2009), healthier sexual decision-making (Campbell & MacPhail, 2002) and greater mental health (Zimmerman et al., 1999), and enhanced political participation (Diemer & Li, 2011; Diemer & Rapa, 2016).

Additional empirical work is needed to further establish the relationship between CC and academic outcomes. It remains unclear, for example, how critical reflection and critical action work together (or individually) to shape positive academic outcomes. Critical reflection may be more important in the development of academic engagement and motivation by providing

students with the capacity or agency to navigate perceived structural barriers that constrain academic success. On the other hand, high levels of critical action—which includes participation in social and political action—may engender the agency that leads marginalized young people to feel agentic within academic contexts or domains (Diemer, Rapa, Park, et al., in press).

While CC has been associated with a number of adaptive and desirable outcomes, and while much empirical work has focused on exploring its contextual antecedents and consequences, we still have a lot to learn about how to foster CC (Godfrey & Grayman, 2014). There has also been very limited experimental work done that would allow for causal interpretations about the development of CC (for an exception, see Chronister & McWhirter, 2006).

Measuring CC. Until recently, no scale had been developed with the explicit purpose of measuring CC (Diemer, McWhirter, Ozer, & Rapa, 2015). Instead, researchers interested in quantitative measurement of CC relied upon indirect measures and repurposed scales to assess an individual's CC. The Critical Consciousness Scale (CCS; Diemer, Rapa, Park, et al., in press) was developed to address this critical gap in the literature, in order to advance and bring together scholarship that has historically utilized proxy measures and disparate forms of representation for CC.[2]

The CCS was developed and validated with predominantly poor and working class African American youth attending urban high schools. The CCS, a 22-item scale, comprises three internally consistent subscales that were determined to correspond with CC's two canonical components of critical reflection and critical action. Specifically, two subscales were established for critical reflection and one subscale was established for critical action. The first subscale for

[2] Notably, a few other scales designed to measure CC emerged simultaneously with the CCS (Baker & Brookins, 2014; McWhirter & McWhirter, 2015; Thomas et al., 2014). See Diemer et al., 2015 for a review.

critical reflection, *critical reflection: perceived inequality*, includes eight items related to an individual's critical awareness and/or analysis of societal inequalities, including race-, gender-, and/or class-based disparities in access to high-quality education and rewarding work. The second subscale for critical reflection, *critical reflection: egalitarianism*, includes five items related to an individual's endorsement of equitable social position among societal groups.

The single subscale for critical action, *critical action: sociopolitical participation*, includes nine items and relates to an individual's participation in civic or political action in order to effect change. The CCS measures engagement in specific forms of civic or political action, such as participation in a civil rights group, political party or club, protesting or demonstrating, contacting public officials, or working on a political campaign. The CCS captures participation in these civic or political actions by asking respondents to indicate the frequency of their participation, not just participation alone.

Fostering CC. CC interventions have typically utilized five techniques to foster CC, including: (1) focusing on shared values, (2) fostering awareness of sociopolitical circumstances, (3) encouraging critical questioning, (4) fostering collective identity, and (5) taking sociopolitical action (Watts & Hipolito-Delgado, 2015). These techniques rely on collaborative small-group dialogue, with facilitators guiding participants in discussion that enables them to connect personal experiences of marginalization to larger social structures and issues. Efforts to develop CC are time- and labor-intensive, and they are focused on promoting critical reflection, engendering agency, prompting action, and fostering a collective identity—often based on demographic or other social identities—among participants.

For example, Freire's (1973) initial attempts to foster CC entailed Brazilian peasants' participation in culture circles as a means to develop capacity to "read the word" as well as "read

the world." These culture circles were focused on raising participants' awareness of sociocultural and sociopolitical marginalization and oppression. Freire's culture circles would meet for an extended series of meetings, with participants engaging in a collaborative and dialogic process to analyze everyday situations or objects (e.g., renderings of an indigenous hunter with a bow and arrow) in order to identify and build understanding about social, cultural, and political issues affecting them.

More recent interventions to foster CC have supplemented Freire's approach by engaging youth in (a) pedagogical activities focused on critically analyzing race-, class-, and gender-based inequities or (b) youth-led participatory action research (yPAR) activities. For instance, Duncan-Andrade and Morrell's (2008) year-long CC intervention provided urban students with opportunities to examine contemporary issues of power and oppression, within the context of students' English class. In order to accomplish this, course reading lists were expanded beyond traditional texts (e.g., *Beowulf* and *Hamlet*) to include the study of popular films, books, and hip-hop music as a way to examine dominant narratives, normative cultural perspectives, and inequities relevant to students' lives (e.g., academic achievement in urban public school contexts). Participation in these activities provided students with numerous opportunities to reflect on societal inequities, build agency to navigate the constraints they faced in their school and communities, and also gave them a platform to work to redress such inequities and constraints.

Another such intervention, the now-banned Mexican American Studies program implemented by the Tucson Unified School District, engaged students in critiques of traditional curricula in which experiences of students of color were absent. The MAS explicitly included an examination of U.S. colonial history and legacy, and its curriculum created dialogic spaces for

students and teachers to confront experiences with racism and other forms of marginalization within their school, linking these experiences to societal and institutional racism and exclusion through discussion and yPAR (Cabrera, Milem, Jaquette, & Marx, 2014). These interventions—both Freire's initial culture circles and more contemporary approaches using critical pedagogy and/or yPAR—are time- and labor-intensive ways to promote CC development. As such, CC is typically thought to be slow to develop and difficult to foster.

CC as a Component of Identity. Adolescence is well known to be a time of identity development, with identity formation being a primary developmental task during this period. As part of the process of identity formation, youth establish values and beliefs that will govern their lives and their interactions with others in the world (Erikson, 1968). For adolescents who are marginalized, this extends to ethnic-racial attitudes and self-appraisals, ethnic-racial classification and identification, and awareness of group-based stereotype or stigmatization (García Coll et al., 1996; McKown, 2013; Phinney, 1990; Quintana, 1998). CC, which helps adolescents situate their self-appraisals in light of the context of societal oppression, can be thought of as a central component of marginalized youths' identity and sense-of-self (Quintana & Segura-Herrera, 2003).

In more specific terms, both core components of CC—*critical reflection* and *critical action*—have been linked to identity development and identity expression in adolescents. For example, *critical reflection* has been tied to how one sees himself or herself in relation to others in the world, both those within and outside of one's social group (Tajfel & Turner, 1979), as well as in relation to societal inequities and social problems (Martinez, Penaloza, & Valenzuela, 2012). *Critical action*, on the other hand, has been linked to one's personal identity in terms of social responsibility and civic engagement (Crocetti, Jahromi, & Meeus, 2012) as well as one's

social identity as part of group that is disadvantaged or marginalized (van Zomeren, Postmes, & Spears, 2008). CC can be thought of as a part of one's identity, insofar as *critical reflection* and *critical action* each shape and are shaped by how one relates to and interacts with the people and social structures within one's context.

Values Affirmation as a Means to Foster Academic Achievement and CC

A CC-related values-affirmation intervention is theorized to have effects both in terms of enhancing academic performance—like the standard values-affirmation intervention does—and in terms of fostering the CC of marginalized youth. As noted above, self-affirmation in any domain—via reflection on qualities or values that are important to an individual or are believed to represent the self—bolsters one's sense of self in the face of situational or environmental threats. Similarly, reflection on CC-related values—or, manifestations of values that are related to CC's critical reflection, critical motivation, or critical action components—should provide marginalized youth with the opportunity to critically reflect on inequitable social conditions, promoting agency and compelling them toward action to redress such inequities.

Using CC-related Values to Foster Academic Achievement through Values Affirmation

Most values affirmation interventions have used one of two values lists (McQueen & Klein, 2006), one established by Allport, Vernon, and Lindzey (1960) or by Harber (1995). However some self-affirmation interventions have used varied values lists to suit the particular needs of the research at hand. For example, Schimel, Arndt, Banko, and Cook (2004) focused on valued self-definitions related to professions or occupations (e.g., artist, athlete, musician, lawyer, student, etc.). Reed and Aspinwall (1998) focused on various kindness behaviors, with their intervention asking participants to describe events where those kindness behaviors were exhibited. G. L. Cohen et al. (2006) utilized an adapted version of Harber's scale (1995) and

included a list of eleven values: athletic ability, being good at art, creativity, independence, living in the moment, membership in a social group, music, politics, relationships with friends or family, religious values, and sense of humor.

Focusing on values relevant to CC should promote the opportunity for individuals to self-affirm just as the more traditional values-affirmation does. That is, reflection on CC-related values should promote self-affirmation in the same way as reflection on other values salient to one's identity. This is especially the case given (a) the opportunity to self-select the values and reflect on those that are personally meaningful and (b) the established links between CC and identity (Quintana & Segura-Herrera, 2003). As with the standard values-affirmation interventions (G. L. Cohen et al., 2006; G. L. Cohen et al., 2009), the self-affirmation promoted through reflection on CC-related values will presumably enhance self-resources so threatened individuals can cope with threat, will equip those under threat with a broader context in which threat can be situated, and will provides the opportunity to decouple self-evaluation from their school environment where the threat is experienced.

Using a Values-Affirmation Intervention to Foster CC

Self-reflection on CC-related values should provide marginalized youth not only with the opportunity to affirm salient aspects of their identity, but it should also allow them the opportunity to critically reflect on their social conditions. This critical reflection, a central component of CC theory (Freire, 1973, 2000), is the process by which individuals come "to see critically the way they exist in the world with which and in which they find themselves" (Freire, 2000, p. 83). According to Freire's initial conception of CC, critical reflection leads to critical action and critical action, in turn, leads to further critical reflection (Freire, 1973). The two exist and operate reciprocally, mutually informing each other and spurring on enhanced CC over time.

A CC values-affirmation intervention should contribute to the development of CC by allowing students with the opportunity to reflect on CC-related values that individuals find personally meaningful, thinking about times when those values have been meaningful to them and giving them the chance to project into the future about how they might have the opportunity to exhibit such values in the near-term.

The Current Study

This project draws on social psychology and CC literatures to examine if a values-affirmation intervention, focused on CC-related values, can be used to raise students' academic achievement and to foster students' CC simultaneously. The study represents a first attempt at conducting a field experiment to test if an altered values-affirmation intervention can affect both academic and CC-related outcomes. Following the design and procedures established by G. L. Cohen et al. (2006), participants were randomly assigned to one of two study conditions (Gerber & Green, 2012), the *no affirmation CC condition* and the *CC affirmation condition*, each described in greater detail in Chapter 3.

Research Questions

This study's primary goal was to test if a CC-oriented values-affirmation intervention could engender increased academic performance while also fostering CC, raising students' levels of critical reflection, critical motivation, and/or critical action at the same time. The project was driven by two overarching research questions:

1. Can a CC values-affirmation intervention bolster students' academic performance?
2. Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?

Study Hypotheses

I hypothesized that the CC values-affirmation intervention would bolster students' academic performance in the same way that a traditional values-affirmation intervention has been shown to do. That is, participants within the CC treatment condition were expected to have increased academic performance as compared to the control condition.

Similarly, I hypothesized that the CC values-affirmation intervention would increase students' CC. Grounded in recent innovations in the measurement of CC (Diemer, Rapa, Park, et al., in press), students' levels of critical reflection, critical motivation, and critical action were to be examined separately as opposed to holistically. I expected the CC values-affirmation intervention to increase students' critical reflection and critical motivation. Changes in critical action were expected to emerge more slowly. That is, differences in critical action were not hypothesized to appear during the duration of this study. However, given the reciprocal relationship between critical reflection and critical action (Freire, 2000), I did expect differences in critical action to emerge over a more extended period of time.[3]

[3] Although following study participants longitudinally was not a part of this dissertation project (as a result of practical limitations related to project completion timelines), I intended to follow participants over time. This subsequent, or continuing project would aim to see if and how the CC-related intervention led to differences in critical action (and other outcomes) over time, as well as how enduring any identified effects on GPA and the other CC components might be.

CHAPTER THREE

Method

This study was designed to examine if a CC-oriented values-affirmation intervention might bolster academic performance and simultaneously foster CC, raising students' levels of critical reflection, critical motivation, and/or critical action. After the initial development of intervention materials, adapted from the landmark study conducted by G. L. Cohen et al. (2006), an initial pilot test was conducted. After this pilot test was completed, the full-scale implementation of the values-affirmation intervention was carried out. In this chapter, I first provide an overview of the pilot study's research design, participants, procedures, and data analysis plan, along with the results of the pilot study, which was conducted to validate the intervention materials to be used in the subsequent full-scale study. I then provide an overview of the full-scale values-affirmation intervention, discussing its research design, participants, procedures, and my data analysis plan.

Pilot Test of the CC Values-Affirmation Intervention Materials

Research Design

A pilot test was conducted in June 2015 in order to test intervention procedures and finalize designs for the full-scale study's control and treatment conditions. Pilot test participants completed one of the two intervention exercises corresponding with the study's *no affirmation* and *affirmation* conditions, described in further detail below. After completing the intervention materials, participants engaged in a modified cognitive interview process (Desimone & LeFloch, 2004) in order to confirm their understanding of what the intervention exercises were asking them to do, how they interpreted key terms and ideas within the exercise, and what their thought process was while completing the exercise (see Appendix A).

Participants

Study participants were recruited from a public charter high school in the Midwestern United States. In the spring of the 2014-2015 school year, hard copy consent forms were distributed via school distribution to the primary parent or guardian of all ninth grade students enrolled in the school (n = 167). Consent was provided for ten students (approximately 6%). After consent was provided, I worked with the school administrator to schedule a time, date, and location for the pilot test. In the end, six consented students were in attendance and able to participate in the pilot test on the date it was scheduled to take place. No administrative data was collected from the school for pilot test participants, as the purpose of the pilot test was solely to ensure the interpretability of the study's intervention materials.

Measures

The pilot test was intended to validate the interpretability of the intervention materials. Students who received the Condition 1 *no affirmation* activities examined Field Test "Form A" (Appendix B) while students who received the Condition 2 *affirmation* activities examined Field Test "Form B" (Appendix C).

Condition 1: Critical consciousness no affirmation condition. In this "control" condition, participants examined and identified three values that were least important to them, choosing from a list of eleven values, or age-appropriate manifestations of values, relating to the components of CC (Diemer, Rapa, Park, et al., in press; Watts et al., 2011). For example, values were related to racial, gender or social class equality, group equality, or participation in political discussions or activities.

Consistent with the administration procedures for a standard no-affirmation condition (cf. G. L. Cohen et al., 2006), participants then wrote about a time when their three selected *least*

important values might be important to someone else. To reinforce the manipulation, students were also asked to identify the top two reasons why the values they selected might be important to someone else (cf. G. L. Cohen et al., 2006), as well as indicate their level of agreement with statements like "These values have influenced some people's lives" and "These values are an important part of who some people are."

Condition 2: Critical consciousness affirmation condition. In this "treatment" condition, participants examined and identified three values that were most important to them, choosing from the same list of eleven values relating to the components of CC. Following the administration procedures for the standard-affirmation condition (cf. G. L. Cohen et al., 2006), participants were then asked to write about a time when their three selected *most important* values were important to them. To reinforce the manipulation students were also asked to reflect on what opportunities they might have to exhibit these values at their school, in their neighborhood, or in their communities during their current school year, as well as indicate their level of agreement with statements like "These values have influenced my life" and "These values are an important part of who I am."

Study Procedures

One school site was selected to participate in the pilot test. Once the list of consented students was finalized, I coordinated with the administrator of the school to identify a convenient time, date, and location within the school for the pilot test to take place. In preparation for the pilot test, and in advance of participants' completion of the study activities, students were pre-assigned, through random assignment, to complete either "Form A" or "Form B" activities (see Appendices B and C, respectively). Specifically, consented students were organized alphabetically by last name and sequentially assigned a number, 1-10. Those numbers were then

processed through a random sequence generator in order to provide a sort-order for assignment to “Form A” and “Form B”. The first number appearing in the sort-order, as provided by the random sequence generator, was assigned “Form A” while the second was assigned “Form B”. Assignments to “Form A” or “Form B” rotated, in turn, until all consented students were pre-assigned to a set of study activities.

Prior to beginning the pilot test activities, the purpose of the study was introduced and an overview of study activities was provided. Then the consented students were given the opportunity to review and sign an assent form. As an incentive for agreeing to participate in the pilot test, participants were reminded that they could win, through another random drawing, one of five $20.00 gift cards to Amazon.com. No consented students who were present when the study was introduced declined to participate in the pilot test.

Pursuant to the design of the pilot test, participants first completed their pre-assigned activities and were then invited to engage in a modified cognitive interview (see Appendix A). As introduced above, the purpose of the cognitive interview was to confirm participants’ understanding of what the intervention exercises were asking them to do, how they interpreted key terms and ideas within the exercise, and what their thought process was while completing the exercise.

Data Analysis and Results of the Pilot Test

Given the purpose of the pilot study and its related cognitive interview, analysis of pilot test data was limited to assessing participants’ verbal responses to the cognitive interview prompts. Because the procedures used in this study were intended to conform to the procedures used for standard values-affirmation intervention studies (G. L. Cohen et al., 2006), the analyses were not intended to result in changes to the study procedures, sequence of activities, or format

of the intervention materials. Instead, I was looking for potential areas of concern with respect to participants' ability to understand the contents of the CC-oriented values list.

The cognitive interviews conducted during the pilot test suggested that the intervention activities were understood by and clear to pilot test participants. In short, the pilot test confirmed that participants understood the tasks included in the CC-oriented values list and also that they could interpret the list of CC-related values included in the intervention. The same values list appeared in both "Form A" and "Form B" (see Appendices B and C, respectively). Participant responses to the questions posed during the cognitive interview (see Appendix A) suggested participants' understanding of *values* as something important to them as individuals, something important to do, something that they would stand up for, or how things are supposed to be.

Additionally, during the cognitive interview, those who completed the "Form A" activities (i.e., the *no affirmation* condition) reported that it was clear that the prompts provided asked them to focus on values that were *least important to them* and also that they were to identify reasons why these values may be important to *someone else.* Similarly, during the cognitive interview, those who completed the "Form B" activities (i.e., the *affirmation* condition) reported that it was clear that the prompts provided asked them to focus on values that were *most important to them* and also that they were to identify reasons why these values were important to *themselves* as opposed to why they would be important to someone else.

Procedurally, participants expressed impressions that Part 3 of the activities—listing the reasons why the identified values as least important might be meaningful to someone else (those completing "Form A") or why the identified values were meaningful to them (those completing "Form B")—felt duplicative of the activities in the preceding parts, Part 1 and Part 2. This suggested the effectiveness of the intended "manipulation check" as a reinforcement of the two

respective study conditions. Given this confirmation and the intent to conform to the procedures used for standard values-affirmation intervention studies (e.g., G. L. Cohen et al., 2006), no changes were made to the study activities prior to the implementation of the full-scale values affirmation intervention.

Full-scale Study: The CC Values-Affirmation Intervention

Research Design

As initially conceived, the full-scale study was designed to include four study conditions. The first two study conditions were intended to replicate the values affirmation studies conducted by Cohen and colleagues (e.g., G. L. Cohen et al., 2006; G. L. Cohen et al., 2009). Due to sample size constraints that emerged during the final stages of preparing to implement the study, including the loss of one sizable participating school at the launch of the study, the study conditions were reduced to include only the two CC-oriented conditions. These study conditions are detailed below (see also Appendix D).

Condition 1: Critical consciousness no affirmation condition. In this "control" condition, participants examined and identified three values that were least important to them, choosing from a list of eleven values, or age-appropriate manifestations of values, relating to the components of CC (Diemer, Rapa, Park, et al., in press; Watts et al., 2011). For example, values were related to racial, gender or social class equality, group equality, or participation in political discussions or activities.

Consistent with the administration procedures for a standard no-affirmation condition (cf. G. L. Cohen et al., 2006), participants then wrote about a time when their three selected *least important* values might be important to someone else. To reinforce the manipulation, students were also asked to identify the top two reasons why the values they selected might be important

to someone else (cf. G. L. Cohen et al., 2006), as well as indicate their level of agreement with statements like “These values have influenced some people’s lives” and “These values are an important part of who some people are.”

Condition 2: Critical consciousness affirmation condition. In this “treatment” condition, participants examined and identified three values that were most important to them, choosing from the same list of eleven values relating to the components of CC.

Following the administration procedures for the standard-affirmation condition (cf. G. L. Cohen et al., 2006), participants were then asked to write about a time when their three selected *most important* values were important to them. To reinforce the manipulation students were also asked to reflect on what opportunities they might have to exhibit these values at their school, in their neighborhood, or in their communities during their current school year, as well as indicate their level of agreement with statements like “These values have influenced my life” and “These values are an important part of who I am.”

Data collection activities for the study were designed to take place over three time points, as depicted in Figure 1. At the outset of the 2015-2016 school year, Time Point 1, administrative data for consented students was provided to the researcher for use in study preparation and for the organization of randomization procedures. Subsequent to the provision of administrative data for all consented students, study participants were to be assigned one of the two conditions at the outset of the study’s intervention activities. These intervention activities took place in Fall 2015, Time Point 2. Finally, the subsequent gathering of administrative data took place in early 2016, Time Point 3, including the collection of both academic performance data and the CCS (for additional information about this academic performance data and the CCS, see also the Measures section below).

Data Collection Time Point	Data Collection Activities	August 2015	October 2015	January 2016
Time Point 1	Collection of pre-intervention administrative data from school sites			
Time Point 2	Administration of CC values-affirmation intervention activities			
Time Point 3	Administration of CCS; collection of post-intervention administrative data from school sites			

Figure 1. Overview of data collection activities by time point.

Participants

Study participants were recruited from a group of five public charter high schools in the Midwestern United States. Demographic data for the recruitment sites is provided in Table 1.

Table 1
Demographic Overview of Recruitment Sites

	Free or Reduced Price Lunch		Students of Color		White		Total
	%	*n*	%	*n*	%	*n*	*n*
School 1	28%	114	61%	251	39%	162	413
School 2	20%	59	52%	172	48%	157	329
School 3	52%	308	68%	399	33%	192	591
School 4	60%	174	64%	183	37%	105	288
School 5	44%	198	50%	224	50%	223	447
Total	41%	853	59%	1,229	41%	839	2,068

At the beginning of the 2015-2016 school year, electronic consent forms were distributed by email to the primary parent/guardian of all ninth and tenth grade students in each of the five school sites. Of the 1,453 ninth and tenth grade students enrolled across the study sites at the time of distribution, approximately 95% (n =1,376) parents had valid email addresses. The response rate was approximately 28% (n = 383), with consent provided for nearly 76% (n = 290) of the 383 received responses. Of the consented students, 84 student responses were received at Time Point 2, while 92 student responses were received at Time Point 3. Because of my interest in examining the intervention's effectiveness at bolstering academic performance and CC

simultaneously, students who did not complete both the intervention activities (Time Point 2) and the CCS (Time Point 3) were excluded from the study's final analytic sample.

The final analytic sample for the full-scale study included 53 ninth and tenth grade students from the group of five public charter high schools situated in the Midwestern United States. This approximates an 18% response rate overall for consented students. Participants' demographic information, which was derived from school administrative records, is presented in Table 2.

Table 2
Overview of Participants in Analytic Sample

School	# Participating Students	Mean Age	# 9th Grade	# Female	# Students of Color	# Free or Reduced Price Lunch
School 1	7	14.79	4	4	4	2
School 2	18	14.69	12	13	7	3
School 3	21	15.37	6	12	11	8
School 4	3	14.72	1	1	1	0
School 5	4	14.69	3	1	0	1
Total	53	14.97	26	31	23	14

Twenty-three participants in the analytic sample identified as students of color. Of these 23 students, nine identified as African American or Black, five identified as Asian, four identified as Latino/a, and five identified as multiracial. Based on administrative data provided by the selection sites, 14 of the 53 students in the analytic sample qualified for free or reduced price lunch. Of those 14, three identified as African American or Black, four identified as multiracial, and seven identified as White.

Measures

To test intervention effectiveness, two categories of outcome variables were used: (1) post-intervention grade point average and (2) post-intervention scores on the CCS. Each set of measures is detailed below.

Post-intervention grade point average. Post-intervention grade point average was used to measure the effectiveness of the intervention in terms of enhancing academic performance. In accord with previous values-affirmation intervention research (e.g., G. L. Cohen et al., 2006), academic outcome data was collected at the end of the semester in which the intervention occurred (i.e., in this case, the end of the Fall 2015 semester).

Post-intervention scores on the CCS. The CCS (Diemer, Rapa, Park, et al., in press) was used to measure each student's level of CC. The validated CCS includes items that measure critical reflection and critical action. Critical reflection comprises two sub-components, *critical reflection: perceived inequality* and *critical reflection: egalitarianism*. Critical action comprises just one component, described by CCS authors as *critical action: sociopolitical participation*. Additional items used during the development of the CCS were utilized in order to measure *critical motivation*, which is posited as a third distinct component of CC (Watts et al., 2011). The scales for these CC sub-components are described below. The instrument itself can be found in the original source publication (Diemer, Rapa, Park, et al., in press) as well as in Appendix E.

As with post-intervention outcome data for academic performance, outcome data on the CCS was collected at the end of the Fall 2015 semester. Each component of CC was examined as a distinct outcome variable, given the recommendations of the CCS authors to consider the sub-components of CC as distinct and to avoid calculating a summary score on the CCS.

Critical Reflection: Perceived Inequality. The scale for *critical reflection: perceived inequality* consisted of eight items that measure each respondent's analysis of socioeconomic, ethnic-racial, and gendered constraints on educational and occupational opportunity (see Table 3). Items were answered on a 1–6 Likert-type scale (1 = *strongly disagree*, 6 = *strongly agree*). Internal consistency for the items was good, with a Cronbach's alpha of .95 and a mean inter-

item correlation of .72.

Table 3
CCS Items Measuring Critical Reflection: Perceived Inequality

Critical Reflection: Perceived Inequality (α = .95)
1. Certain racial or ethnic groups have fewer chances to get a good high school education
2. Poor children have fewer chances to get a good high school education
3. Certain racial or ethnic groups have fewer chances to get good jobs
4. Women have fewer chances to get good jobs
5. Poor people have fewer chances to get good jobs
6. Certain racial or ethnic groups have fewer chances to get ahead
7. Women have fewer chances to get ahead
8. Poor people have fewer chances to get ahead

Critical Reflection: Egalitarianism. The scale for *critical reflection: egalitarianism* entailed five items measuring each respondent's endorsement of societal equality, or all groups of people being treated as equals in society (see Table 4). Items were answered on a 1–6 Likert-type scale (1 = *strongly disagree*, 6 = *strongly agree*). Internal consistency for these items was acceptable, particularly given the low number of items, with a Cronbach's alpha of .76 and a mean inter-item correlation of .41.

Table 4
CCS Items Measuring Critical Reflection: Egalitarianism

Critical Reflection: Egalitarianism (α = .76)
1. It is a good thing that certain groups are at the top and other groups are at the bottom[a]
2. It would be good if groups could be equal
3. Group equality should be our ideal
4. All groups should be given an equal chance in life
5. We would have fewer problems if we treated people more equally

Note. [a]Indicates a reverse-coded item.

Critical Action: Sociopolitical Participation. The scale for *critical action: sociopolitical participation* had nine items that measured each respondent's participation in social and political activities to change perceived inequalities (see Table 5). Items were answered on a 1–5 Likert-type scale (1 = *Never did this*, 5 = *At least once a week*). Internal consistency for these items was

lower than that of the other CC subcomponents, with a Cronbach's alpha of .68. The mean inter-item correlation for the nine items of the scale was .30.

Table 5
CCS Items Measuring Critical Action: Sociopolitical Participation

Critical Action: Sociopolitical Participation (α = .68)
1. Participated in a civil rights group or organization
2. Participated in a political party, club, or organization
3. Wrote a letter to a school, community, newspaper, or publication about a social or political issue
4. Contacted a public official by phone, mail, or email to tell him or her how you felt about a social or political issue
5. Joined in a protest march, political demonstration, or political meeting
6. Worked on a political campaign
7. Participated in a discussion about a social or political issue
8. Signed an email or written petition about a social or political issue
9. Participated in a human rights, gay rights, or women's rights organization or group

Critical Motivation. The scale for *critical motivation* had ten items that measured each respondent's motivation to change perceived inequalities as well as their efficacy beliefs about whether changing such inequalities is actually possible (see Table 6).

Table 6
Survey Items Measuring Critical Motivation

Critical Motivation (α = .77)
1. It is important for young people to speak out when an injustice has occurred
2. Young people have an important role to play in making the world a better place
3. It is important for young people to know what is going on in the world
4. Political issues are not relevant to people who are not old enough to vote[a]
5. It is important to be an active and informed citizen
6. It is important to correct social and economic inequality
7. It is important to confront someone who says something that you think is racist or prejudiced
8. It is my responsibility to get involved and make things better for society
9. People like me should participate in the political activity and decision making of our country
10. It does not matter whether I participate in local organizations or political activity because so many other people are involved[a]

Note. [a]Indicates a reverse-coded item.

Critical motivation is theorized to act as a mediator between critical reflection and critical action

(Watts et al., 2011). Items were answered on a 1–6 Likert-type scale (1 = *strongly disagree,* 6 = *strongly agree*). Internal consistency for these items was acceptable, with a Cronbach's alpha of .77 and a mean inter-item correlation of .27.

Study Procedures

Consistent with the typical procedure for values-affirmation interventions (e.g., G. L. Cohen et al., 2006), participants were randomly assigned to one of two study conditions at the individual student level. Assignments to condition were made in the fall of the 2015-2016 school year, using the computerized survey software Qualtrics to carry out block random assignment (Gerber & Green, 2012). Blocking was done based on participants' racial-ethnic identity status, with White students placed in one block and students of color placed in another block. Block random assignment to study conditions was enacted during students' entry into the study, during the initial launch of the intervention activities (described in further detail below). This method of random assignment was intended to ensure that an approximately equal number of students from different racial-ethnic identity groups were assigned to each of the study's two conditions.[4]

The nature of this study required that this intervention be carried out as "stealthily" as possible, as heightened awareness by participants of the intent of affirmation interventions has been purported to negatively influence their impact. The covert nature of the self-affirmation processes is one likely cause of its positive effects (Sherman & Cohen, 2006; Sherman et al., 2009; Sherman et al., 2013; Yeager & Walton, 2011). As such, administrative staff and teachers were blind to students' participation in the intervention. Administrative staff, teachers, and students themselves were blind to study condition and the study's research hypotheses.

[4] The plans initially developed for data analysis included more extensive sub-group analysis using hierarchical regression or ANOVA/ANCOVA. The limited sample size finally obtained for this study precluded such analyses.

Data Collection: Intervention Activities

All consented students were sent an email inviting them to participate in a brief online reflective writing exercise. Each student received an individualized request, sent via the online survey platform Qualtrics. Upon entry into the survey application, students were randomly assigned to complete the control or treatment activities. The individualized protocols led each student through their respectively assigned intervention exercise (see Appendix D).

Following procedures similar to those established by G. L. Cohen et al. (2006), students were assured that the activities would give them an opportunity to be thinking about and writing some answers to "a few questions about your ideas, your beliefs, and your life." Students were assured that there were "no right or wrong answers" and that they were sharing their responses because I was "just interested in hearing what you think." However, contrary to the G. L. Cohen et al. (2006) study, this intervention was presented as an online activity to be completed on students' own time. That is, it was not presented to students as a typical class assignment occurring within the course of their regular school day. In this regard, the presentation of these intervention activities more closely mirrored other social-psychological interventions that have been implemented in educational contexts in recent years—online and decontextualized from a specific course or content area (Brady et al., 2016). Students received targeted directions for completing the exercise online as they progressed through the intervention activities.

Data Collection: Critical Consciousness Scale

Using the same procedures employed during the intervention activities (i.e., Time Point 2), all consented students were sent an email inviting them to participate in a brief online survey (i.e., the CCS, at Time Point 3). Students received directions for completing the survey online as they progressed through the survey. Students were assured that there were "no right or wrong

answers" and that they were sharing their responses because I was "just interested in hearing what you think." The contents of the survey are presented in Appendix E.

Data Analysis

Data analyses were designed to address the study's two primary research questions, which focused on examining the effectiveness of the CC-oriented values-affirmation intervention in promoting participants' academic performance and CC:

1. Can a CC values-affirmation intervention bolster students' academic performance?
2. Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?

In order to assess intervention effectiveness, analyses were designed to test mean differences between treatment and control groups for each of the study's outcome variables, including post-intervention GPA and post-intervention levels of CC in terms of each of its component parts—i.e., *critical reflection: perceived inequality*, *critical reflection: egalitarianism*, *critical action: sociopolitical participation*, and *critical motivation*. Post hoc sensitivity analyses, discussed when appropriate below, were carried out as needed in order to further test or examine mean differences between the control and treatment groups in terms of the outcomes of interest.

CHAPTER FOUR

Results and Discussion

This project sought to test the effectiveness of a CC-oriented values-affirmation intervention, inquiring if such an intervention might bolster academic performance and increase levels of CC for participants in the treatment condition simultaneously. Two primary research questions drove this inquiry: Research Question 1: *Can a CC values-affirmation intervention bolster students' academic performance?* and Research Question 2: *Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?* The results presented in this chapter are based on analyses of outcome data for study participants. Specifically, second semester grade point average is the outcome data examined to address Research Question 1, while survey responses collected through the administration of the CCS is the outcome data examined to address Research Question 2. In this chapter, I present the results of the CC values-affirmation intervention as framed by the study's two research questions.

Results of the Full-Scale CC Values-Affirmation Intervention

Analyses for the full-scale CC values-affirmation intervention study comprised independent samples t-tests, which were used to assess mean differences between the control (n = 28) and treatment (n = 25) groups for each of the outcome variables. An alpha level of $\alpha = .05$ was used as the *a priori* significance level for all analyses. After demonstrating the success of the randomization procedures used to assign participants to study conditions, results are presented in relation to the study's research questions and their respective outcome variables.

Effectiveness of Randomization Procedures

Block random assignment (Gerber & Green, 2012) was completed using computerized

survey software, Qualtrics, in order to assign participants to study conditions. Blocking was based on participants' racial-ethnic identity status. Students of color were placed in one block and White students placed in another block, with randomization to control or treatment condition completed within each block. The assignment of participants to study conditions was carried out at the start of students' entry into the study, during the first of the two data collection activities, in Fall 2015.

As detailed in Table 7, randomization procedures appeared to be successful, with an approximately equal number of students of color in each of the study conditions, i.e., the treatment and control groups. As such, the assignment of participants to condition was appropriately balanced.

Table 7
Participants by Condition and Ethnic-racial Identity Status

	Student of Color	White Student	Total
Control Group	12	16	28
Treatment Group	11	14	25
Total	23	30	53

There were no observed differences between treatment and control groups on baseline, pre-intervention measures of academic performance (Time Period 1). That is, academic performance was statistically equal between groups at the start of the intervention. No significant difference in performance on the Northwest Evaluation Association Measures of Academic Progress[5] (NWEA MAP) in reading was found between the control group ($M = 235.22$, $SD = 16.57$, $N = 27$) and the treatment group ($M = 241.83$, $SD = 13.77$, $N = 24$), $t(49) = -1.54$, $p = .13$, two tailed. Nor was there any difference found in baseline NWEA MAP mathematics scores between the control group ($M = 246.93$, $SD = 15.59$ $N = 26$) and treatment group ($M = 254.08$, $SD = 18.89$, $N = 25$), $t(49) = -1.48$, $p = .15$, two tailed. Finally, no pre-intervention differences were found between

[5] See www.nwea.org. The NWEA MAP is a nationally normed, computer adaptive interim assessment used to measure academic proficiency levels and track academic growth.

treatment and control groups in school-based academic performance in the semester's first quarter.[6]

Research Question 1: Can a CC values-affirmation intervention bolster students' academic performance?

Grade Point Average. Descriptive statistics for second semester Grade Point Average (GPA) are displayed in Table 8. Examining post-intervention GPA, no significant differences were found between the treatment and control group. However, mean differences in GPA approached significance, with the control group's GPA ($M = 3.33$, $SD = 0.63$, $N = 28$) appearing to be lower than that of the treatment group ($M = 3.64$, $SD = 0.51$, $N = 25$), $t(51) = -1.96$, $p = .06$, two tailed. Cohen's effect size value ($d = .54$) for this analysis was above the conventional level of a medium effect, $d = .50$ (J. Cohen, 1988), suggesting moderate practical significance in terms of a difference in GPA between the treatment and control groups. That is, those who participated in the intervention appeared to have a meaningfully higher GPA as a result of their assignment to the intervention's treatment group.

Table 8
Descriptive Statistics: Second Semester Grade Point Average

	Control		Treatment		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*
GPA	3.33	0.63	3.64	0.51	3.47	0.59

Given the size of the study's analytic sample, the effect size necessary to detect significant effects was large, following J. Cohen's (1988) classification of $d = .80$ as a large effect. A post-hoc power analysis of sensitivity, conducted in G*Power 3.1, demonstrates this necessary effect and is reported in Table 9.

[6] Students' school-based first quarter academic performance was determined by creating a composite, GPA-like score based on performance in the core four classes of reading, mathematics, science, and social studies. However, this first quarter score was composed of grades collected both pre-and post-intervention during each school's first marking period. Contrarily, the NWEA MAP tests were administered prior to the start of the intervention. For this reason, NWEA MAP scores were determined to represent a better baseline academic performance measure.

Table 9

Required Effect Size Given Sample Size of Analytic Sample

t-tests – Means: Difference between two independent means (two groups)		
Analysis: Sensitivity: Compute required effects		
Input	Tails	Two
	α error probability	0.05
	Power (1- β error probability)	0.8
	Sample size group 1	28
	Sample size group 2	25
Output	Noncentrality parameter δ	2.86
	Critical t	2.01
	Df	51
	Effect size *d*	0.79

With an alpha of .05, the study's analytic sample size (n = 53), and the observed effect size of d = .54, the power of this analysis testing differences in GPA was 0.49. While the difference in GPA between the control and treatment groups did not reach the level of statistical significance, given the brief duration of the treatment, the *observed* difference in GPA is rather substantial. This difference equates to just over one half a standard deviation in post-intervention GPA, meaning that approximately 71% of the treatment group would have higher GPAs than the mean of the control group (J. Cohen, 1988). This medium effect is noteworthy, especially in light of the brief nature of the intervention.

Sensitivity Analyses for the Difference in Post-intervention GPA. As noted above, the analytic sample for this study was restricted to those participants who completed both the intervention activities and the CCS, at Time Points 2 and 3 respectively. Time Point 3 administrative data was available, however, for 31 additional students who completed the intervention at Time Point 2 but failed to complete the CCS at Time Point 3. To carry out post hoc sensitivity analyses, I examined the post-intervention GPA for all who completed the intervention, including those who failed to complete the CCS at Time Point 3 even though they participated in the intervention at Time Point 2.

First, in examining post-intervention GPA for all 84 participants who completed the intervention at Time Point 2, regardless of whether or not they completed the CCS, no significant differences were found between the treatment and control group. The control group's GPA (M = 3.22, SD = 0.69, N = 40) was slightly lower than that of the treatment group (M = 3.24, SD = 0.77, N = 44), $t(82) = -0.15$, p = .88, two tailed. This difference was not statistically significant. Moreover, Cohen's effect size value (d = .03) for this analysis was below the conventional level of a small effect, d = .20 (J. Cohen, 1988), which suggests no practical significance in terms of a difference in GPA between the treatment and control groups based on participation in the intervention alone. This raises the possibility that there may be something essential to completing the CCS—or something endogenous to those who completed the study activities at both Time Points 2 and 3—that may account for the observed treatment effect in academic performance.[7]

Examining post-intervention GPA for just the 31 intervention participants who completed the intervention but who did not also complete the CCS, again no significant differences were found between the treatment and control groups. In this case, the control group's GPA (M = 2.96, SD = 0.80, N = 12) was actually higher than that of the treatment group (M = 2.72, SD = 0.74, N = 19), $t(29) = 0.85$, p = .40, two tailed. Yet, like the previous analysis, this difference was not statistically significant. Cohen's effect size value (d = .31) for this analysis was above the conventional level of a small effect, d = .20 (J. Cohen, 1988), which suggests some practical significance in terms of a difference in GPA between the treatment and control groups. Those who participated in the intervention only and did not also complete the CCS appeared to have a moderately higher GPA as a result of their assignment to the intervention's control group. Again, this suggests that it may be completion of the CCS that may account for the observed treatment effect in academic performance in the analytic sample. For example, those who completed the

[7] See also the discussion section below, which addresses this question of endogeneity.

intervention at Time Point 2 and the CCS at Time Point 3 may be more conscientious, or different in some other way, from those who completed the intervention at Time Point 2 but did not complete the CCS at Time Point 3.

While initial analyses suggested that there were non-significant difference in baseline academic performance across groups, one final sensitivity analysis was completed to examine the potential influence of pre-intervention academic performance on the observed difference in post-intervention GPA for participating students—that is, for the 53 students in the study's analytic sample. This analysis was conducted to determine if treatment effects would persist when controlling for pre-intervention academic performance. To assess the influence of pre-intervention academic performance on the observed effects, an ANCOVA analysis was conducted to test for group differences between the control and the treatment groups in terms of post-intervention GPA, controlling for pre-intervention academic performance on the NWEA MAP tests. The results of this analysis suggested that there was no effect of condition when controlling for pre-intervention NWEA MAP performance in reading, $F(1, 48) = 1.49$, $p = 0.23$, or in math, $F(1, 48) = 0.58$, $p = 0.45$. That is, when accounting for baseline academic performance on NWEA MAP, the effects of intervention condition, control versus treatment, were null. That is, there was not a statistically significant difference in post-intervention GPA between the two groups, after accounting for pre-intervention levels of academic performance. This suggests that baseline academic performance likely plays an important role in the interventions' effectiveness, a point to which I return in the discussion below.

Research Question 2: Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?

Each component of CC was examined as a distinct outcome variable, given the

recommendations of the CCS authors to account for the sub-components of CC as distinct and to avoid calculating a summary score on the CCS (Diemer, Rapa, Park, et al., in press). Composite variables were created for each CC-related outcome variable by summing the scales' respective items for each construct. Specifically, composite variables were created for *critical reflection: perceived inequality*, *critical reflection: egalitarianism*, and *critical action: sociopolitical participation*. Though not validated as part of the original CCS, a composite variable was also created for *critical motivation* using items from the initial CCS instrument development. Descriptive statistics for these composite CC-related variables are provided in Table 10.

Table 10
Descriptive Statistics: Composite Critical Consciousness Outcome Variables

	Control		Treatment		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*
CR: PI	21.16	10.92	21.57	12.24	21.38	11.53
CR: E	26.91	4.00	26.32	4.39	26.61	4.16
CA: SPP	13.05	4.20	12.83	2.46	12.93	3.32
CM	49.00	6.10	52.55	6.51	50.95	6.50

Note. CR: PI = *critical reflection: perceived inequality*; CR: E = *critical reflection: egalitarianism*; CA: SPP = *critical action: sociopolitical participation*; CM = *critical motivation*.

Critical Reflection: Perceived Inequality. For *critical reflection: perceived inequality*, no differences emerged as a result of the intervention. That is, the control group's level of *critical reflection: perceived inequality* ($M = 21.16$, $SD = 10.92$, $N = 19$) was found to be equal to that of the treatment group ($M = 21.57$, $SD = 12.24$, $N = 23$), $t(40) = -0.11$, $p = .911$, two tailed. Cohen's effect size value ($d = .04$) for this analysis fell below the conventional level of a small effect, $d = .20$ (J. Cohen, 1988), suggesting no practical difference between the treatment and control group in terms of perceived inequality.

Critical Reflection: Egalitarianism. Similarly, no mean differences were found for *critical reflection: egalitarianism* between the control ($M = 26.91$, $SD = 4.00$, $N = 21$) and the

treatment group ($M = 26.32$, $SD = 4.39$, $N = 22$), $t(41) = 0.46$, $p = .65$, two tailed.[8] That is, while the treatment group had a slightly lower mean than the control group, this difference was not statistically significant. Cohen's effect size value ($d = .14$) for this analysis fell below the conventional level of a small effect, $d = .20$ (J. Cohen, 1988), suggesting no practical difference between the treatment and control group in terms of egalitarianism.

Critical Action: Sociopolitical Participation. As expected, no mean differences were found for *critical action: sociopolitical participation*.[9] That is, levels of *critical action: sociopolitical participation* were equal between the control ($M = 13.05$, $SD = 4.20$, $N = 19$) and treatment group ($M = 12.83$, $SD = 2.46$, $N = 23$), $t(40)$, 0.21, $p = .84$, two tailed.[10] Cohen's effect size value ($d = .06$) for this analysis fell below the conventional level of a small effect, $d = .20$ (J. Cohen, 1988), suggesting no practical difference between treatment and control group in terms of sociopolitical participation.

Critical Motivation. Levels of critical motivation were equal across groups as well. The control group's critical motivation ($M = 49.00$, $SD = 6.10$, $N = 18$) was statistically equal to the treatment group's ($M = 52.55$, $SD = 6.51$, $N = 22$), although the mean difference approached significance, $t(38) = -1.76$, $p = .09$, two tailed. Cohen's effect size value ($d = .56$) for this analysis was above the conventional level of a medium effect, $d = .50$ (J. Cohen, 1988), suggesting moderate practical significance in terms of differences in critical motivation between the treatment and control groups.

As discussed above, given the size of the study's sample, the effect size necessary to

[8] One potential outlier was removed from the treatment group during this analysis. A test of mean differences in *critical reflection: egalitarianism* remained non-significant when this influential case was included.
[9] Recall that differences in critical action were not expected to emerge during this study, due to its brief duration.
[10] As with the analysis for *critical reflection: egalitarianism*, one potential outlier was removed from the treatment group in this analysis. A test of mean differences in *critical action: sociopolitical participation* remained non-significant when this influential case was included.

detect significant effects was large, following J. Cohen's (1988) classification of $d = .80$ as a large effect (see Table 9). With an alpha of .05, the sample size ($n = 40$; recall that not all participants completed the CCS at Time Point 3), and the observed effect size of $d = .56$, the power of this analysis testing differences in critical motivation was 0.40. While the difference in critical motivation between the control and treatment groups only approached statistical significance, given the brief duration of the treatment this observed difference is rather substantial. The difference equates to just over one half a standard deviation in post-intervention critical motivation, meaning that, again, approximately 71% of the treatment group would have higher level of critical motivation than the mean of the control group (J. Cohen, 1988). As with GPA, the medium effect observed here is noteworthy, especially in light of the brief nature of the intervention.

Normality Assumptions for Outcome Variables

Normality assumptions for outcome variables *critical reflection: egalitarianism*, *critical action: sociopolitical participation*, *critical motivation*, and *grade point average* were violated, with levels of skewness and/or kurtosis too great to ensure the reliability of the independent samples t-test results. This is not surprising given the small sample size. As a result of the non-normal distribution of these outcome variables, bootstrapping was employed to provide robust estimates of the standard errors and confidence intervals for estimated parameters.

Bootstrapping procedures for critical motivation moved the estimate of a mean difference between the treatment and control group closer toward the significant level, $t(38) = –1.76$, $p = .08$, 95% CI [–7.21, 0.19]. Similarly, bootstrapping procedures for GPA moved the estimate of a mean difference between treatment and control group to the significant level, $t(51) = –1.96$, $p = .05$, 95% CI [–0.60, 0.01]. Bootstrapping procedures for the other noted outcome variables (i.e.,

critical reflection: egalitarianism and *critical action: sociopolitical participation*) did not substantively change their results.

In addition to the utilization of bootstrapping techniques to provide robust estimates of the standard errors and confidence intervals for estimated parameters, nonparametric analyses were used to provide additional testing of group differences for the critical motivation and GPA outcome variables (Siebert & Siebert, forthcoming, 2016). Specifically, independent samples Mann-Whitney U tests were carried out in order to examine if the distributions for these two outcome variables were found to be equal across the control and treatment groups. The Mann-Whitney U test is used in place of an independent samples t-test when sample sizes are small and when underlying normality assumptions do not hold for outcome variables (Hinkle, Wiersma, & Jurs, 2003).[11]

Significant values were found for both respective independent samples Mann-Whitney U tests. This suggests that the population distributions for each outcome variable, GPA and critical motivation, were in fact different for the treatment and control groups (see Table 11).

Table 11
Independent Samples Mann-Whitney U Tests: Second Semester Grade Point Average and Critical Motivation

	Group	N	Sum of Ranks	*U*	*p*
GPA	Control	28	642.00	236.00	.04
	Treatment	25	789.00		
Critical Motivation	Control	18	276.50	105.50	.01
	Treatment	22	543.50		

Significant values for these two independent samples Mann-Whitney U tests reinforce the trend-level evidence that the participation in the intervention's treatment group was associated with

[11] The Mann-Whitney U test's hypothesis is that the population distributions of the two groups, control and treatment in this case, are the same for the specified outcome variable. A statistically significant *U* value suggests rejection of the null hypothesis that the two population distributions are equal.

higher levels of critical motivation and an increased GPA.[12]

Discussion

The results of the CC values-affirmation intervention suggest promise in the use of a brief, CC-oriented values-affirmation intervention to enhance students' academic performance. At the outset of the study, I hypothesized that the CC values-affirmation intervention would bolster students' academic performance in the same way that a traditional values-affirmation intervention has been shown to do. In other words, participants in the CC treatment condition were expected to have increased academic performance as compared to participants in the control condition.

Answering Research Question 1: *Can a CC values-affirmation intervention bolster students' academic performance?*, initial independent sample t-test results showed that there were differences in GPA that approached significance between the control and the treatment groups for the analytic sample. Further, when bootstrapping procedures were employed, as a means to extend the initial analysis by providing robust standard error and confidence interval estimates, a significant mean difference in second semester GPA was found between the control group and the treatment group. Specifically, the observed mean difference between the control and treatment groups in second semester GPA was –0.31, $t(51) = -1.96$, $p = .05$, 95% CI [–0.60, 0.01].

Because t-tests can be unreliable with small sample sizes, nonparametric testing was used to examine if the distributions of the control and treatment groups were equal in terms of GPA. This nonparametric testing suggested that the two population distributions were not equal, with the treatment group's GPA being significantly different from—and higher than—the control

[12] I also conducted a Mann-Whitney U test to examine differences in the GPA of the 31 students who completed the intervention but not the CCS. That test was insignificant, suggesting the likelihood that the two population distributions for GPA were equal—i.e., that there was no difference between the two groups.

group's GPA. Taken together, the collection of evidence suggests that the intervention had a positive effect in terms of bolstering the academic performance of students in the treatment condition.

Yet, these results should be interpreted with caution. Post-hoc sensitivity analyses were conducted to examine these results further, and these analyses suggested that there might be some interaction between participants' engagement in the intervention at Time Point 2 and its subsequent activities (i.e., the Time Point 3 administration of the CCS) and the effects on academic performance (see Figure 2). Specifically, respondents who completed the CCS in addition to the intervention activities and were in the treatment condition had a second semester GPA that was 0.31 points *higher* than those in the control condition (d = .54). As noted previously, this difference approached significance using an independent samples t-test (p = .06) and actually reached significance when using bootstrapping procedures (p = .05). Further, nonparametric testing of group differences confirmed that the population distributions of the two groups were likely to be distinct (p = .04).

Contrarily, though, respondents *who did not also complete the CCS after the intervention* and were in the treatment condition had a second semester GPA that was 0.24 points *lower* than those in the control condition. This difference was not statistically significant (p = .40), and it remained insignificant even when employing bootstrapping procedures (p = .42). Nonparametric testing of group differences was also insignificant (p = .48). However, the effect size for the observed difference was between a small and medium effect (d = .31), suggesting that there was some practical difference between the control and the treatment group in terms of post-intervention GPA for those who completed only the intervention yet did not also complete the CCS.

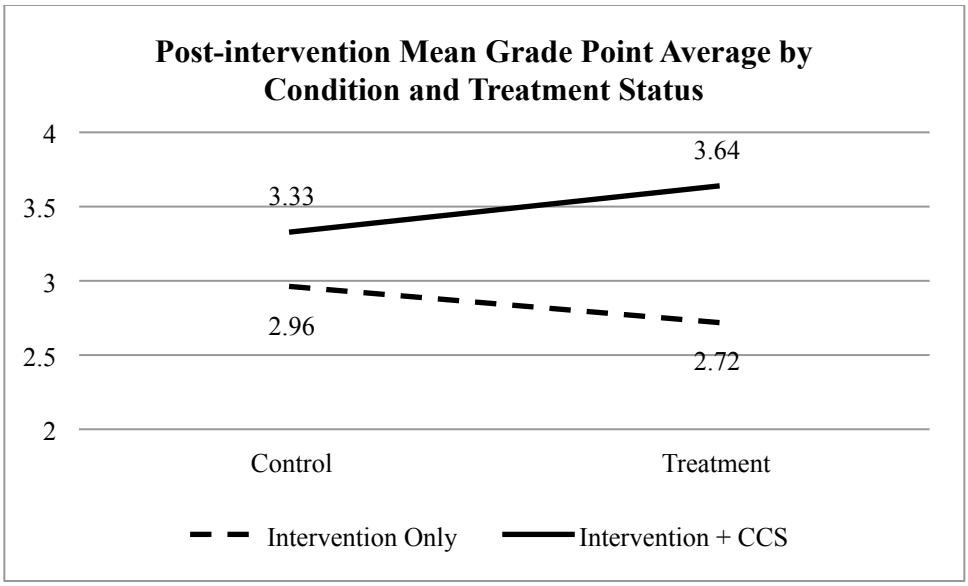

Figure 2. Post-intervention mean grade point average by condition and treatment status.

There are at least a few reasons why this may be the case. First, it is possible, if not likely, that students who completed both the intervention and the CCS had unobserved (i.e., endogenous) characteristics or attributes that made them particularly sensitive to the effects of the intervention. Additional post-hoc analysis of pre-intervention NWEA MAP performance was carried out to explore this possible explanation. Differences in baseline NWEA MAP scores were tested for those completing the intervention only versus those who completed the intervention *and also* completed the CCS. Significant differences were found between groups—intervention only versus intervention plus the CCS—in both baseline NWEA MAP reading scores [$t(78) = -2.65$, $p = .01$] as well as NWEA MAP math scores [$t(78) = -3.90$, $p < .001$), with higher mean scores observed in reading and math for those who completed the intervention and the CCS. This indicates that those who completed both the intervention and the CCS had higher academic performance at the outset of the study than those who completed the intervention only. Because these participants self-selected to complete optional study activities at both time points (see Figure 1), it is feasible that the participants in this study's analytic sample

were already high-performing students, with an especially high degree of engagement with school and school-related activities, or that they were particularly conscientious. This high engagement or conscientiousness may have engendered greater attentiveness to the intervention and greater investment in the self-affirmation task, making them more susceptible, in turn, to the effects of the intervention on GPA. This is a possibility, especially as compared to the values-affirmation conducted by G. L. Cohen et al. (2006). Students in this study completed all intervention and survey activities online, at their discretion and on their own free time. On the other hand, students in the original G. L. Cohen et al. (2006) study completed all intervention activities in-seat, within the context of the classroom and under the guise of regular classroom activities. The online, de-contextualized nature of the intervention activities used in this study does not implicitly support this explanation and yet, while this approach is not wholly unique (see, for example, Brady et al., 2016), there may be something peculiar about this sample that makes this explanation plausible.

Another interpretation might be that there was something about the completion of both components of the study activities—i.e., the intervention and the CCS—that made the intervention effective only when completed in combination. However, given the close proximity of Time Point 3 and the collection of the administrative data that included second semester GPA—both of which occurred in January 2016—this explanation is not very likely.

These results might also be an artifact of the sample itself. For the analytic sample, the difference in GPA between the control and the treatment group approached significance when conducting the independent samples t-tests, and it actually reached significance when utilizing bootstrapping techniques. Despite the significant difference and the medium effect size, it is possible that the results observed here may not stand with a different, larger sample. That is, the

results reported here might somehow be reflective of spurious findings. Similarly, for the sample examined in the sensitivity analysis (i.e., the 31 participants who completed the intervention but not the CCS), the difference between the control and the treatment group was insignificant, both when conducting normal independent samples t-tests and when utilizing bootstrapping techniques. These observed results also might not stand with a different, larger sample. However, given the confirmation of the reported results when using additional nonparametric testing—for both the analytic sample and the sample used during sensitivity analysis—the explanation that these results are just an artifact of the sample or due to sampling error is also not very likely.

As noted previously, this study was modeled on the values-affirmation conducted by G. L. Cohen et al. (2006). The differences in GPA between the treatment and control groups for the study's analytic sample—those participants who completed both the intervention activities and the CCS—are comparable to that landmark study. While G. L. Cohen et al. (2006) do not provide sufficient information to calculate a precise effect size for their intervention (i.e., *M*s and *SD*s for GPA for their control and treatment groups were not included), the difference in GPA observed across conditions in this study—0.31 grade points—is parallel the reported GPA differences of 0.26 and 0.34 grade points in their Study 1 and Study 2, respectively.[13] Given the GPA *M*s and *SD*s reported for this study's analytic sample, the observed difference between the control and the treatment group translates to just over half a standard deviation in academic performance. Statistically speaking, such a standard deviation is generally equated to a "medium" effect (J. Cohen, 1988). Given the brief duration of the treatment, this difference in GPA is rather substantial. Regardless of the mechanism, there is promise that the intervention had some positive effects on academic performance.

The study by G. L. Cohen et al. (2006) showed that their values-affirmation intervention

[13] These GPA differences were reported for treated African American students specifically.

was most effective with students of color, and specifically with those who were the lowest performing. It may be that this adapted, CC-oriented values-affirmation intervention was only effective with the students who were high performing at the outset. It may also be that this adapted intervention was differentially effective with students of color as compared to White participants. Due to the logistical constraints with my partner schools and the loss of one substantially sized school at the outset of this study, the final analytic sample was rather small—so small that it precluded more extensive analysis and exploration of potential subgroup differences in post-intervention GPA and the other outcome variables.[14] While there is substantive evidence suggesting that this intervention was effective at bolstering the academic performance of those in the treatment condition, questions do remain about *for whom* and *under what conditions* this intervention has positive effects. These questions of moderating effects are fruitful directions for future research.

Study results also suggest promise in the use of a CC-oriented values-affirmation intervention to enhance students' levels of CC simultaneous to bolstering their academic performance. At the outset of the study, I hypothesized that this CC values-affirmation intervention would increase students' levels of CC, as measured by the CCS and in terms of CC's three component parts: *critical reflection*, *critical motivation*, and *critical action*. In particular, I expected the intervention to increase students' *critical reflection* and *critical motivation.* Changes in *critical action* were expected to emerge more slowly, so differences were not expected to emerge by the time CC-related outcome data was collected.

Answering Research Question 2: *Can a CC values-affirmation intervention also increase students' CC, as measured by their levels of critical reflection, critical motivation, and/or critical action?*, independent samples t-tests were performed to test differences in the treatment

[14] See Appendix F, however, for a very preliminary subgroup analysis.

and control group members' CC, based on levels of CC as measured by the CCS. Contrary to study hypotheses, significant differences in *critical reflection: perceived inequality* and *critical reflection: egalitarianism* did not emerge as a result of the intervention. While the analyses conducted here may have been underpowered due to the small size of the analytic sample (n = 53), there were no significant mean differences observed between the control group and the treatment group in either of the *critical reflection* subcomponents of CC.

It appears that the self-affirmation exercise reflecting on CC-related values did not influence adolescents' *critical reflection: perceived inequality*. It is possible that the reflection on values that are manifestations of equality only serves to solidify the equality-related beliefs that young people already hold (or, perchance, do not hold) as opposed to being a generative force in raising perceived inequality. Emergent sociological literature demonstrates that adolescents' perceptions of inequality develop as a result of their *exposure* to inequality, which ultimately is a function of the places and spaces that youth inhabit and traverse as part of their daily lives (Shedd, 2015). It may be that mere individual reflection on equality-related values is not sufficient to prompt greater levels of perceptions of inequality. Alternatively, it may be that perceptions of inequality are best bolstered by engaging in reflection with others, wrestling with the realities of inequality alongside those who have a shared social identity and are part of a collective struggle about the nature of inequitable social conditions (Sánchez Carmen et al., 2015).

For *critical reflection: egalitarianism*, the treatment group had a slightly lower, yet insignificant mean difference than the control group (p = .65). However, Cohen's effect size value for this difference (d = .14) approached a small effect, d = .20 (J. Cohen, 1988). While an effect size below a small effect suggests very minimal, if any practical difference between the

treatment and control group in terms of egalitarianism, it is possible that the intervention had a very slight negative effect on participants' egalitarian beliefs. It may be that thinking about values related to equality, egalitarianism, and sociopolitical participation caused participants to be disillusioned about group equality. Alternatively, it may simply be that these results reflect variability due to sampling error. Subsequent trials of this intervention might help substantiate or tease out what is contributing to this observed effect.

Finally, there was no mean difference between the control and treatment group in terms of *critical action: sociopolitical participation*. This finding was expected, however, since changes in critical action were anticipated to emerge more slowly than changes in *critical reflection* and *critical motivation* (and, more substantively, after the data collection process for this study was concluded). That is, differences were not expected to be observed during the duration of the study. While outside the scope of this dissertation project, I do hope to follow participants over time to see if changes in *critical action* emerge over a longer period of time than was possible to include in this study.

As reported in the Results section of this chapter, when bootstrapping procedures were employed during independent samples t-test analyses, a mean difference approaching significance was found between the control group and the treatment group in terms of critical motivation. The mean difference in critical motivation between the control and treatment groups was –3.55, 95% CI [–7.21, 0.19]. That is, the treatment group's critical motivation was 3.55 points higher than that of the control group. Nonparametric testing reinforced this trend-level evidence suggesting that the intervention was associated with higher levels of critical motivation. Taken together, the collection of evidence suggests that the intervention had a positive effect in raising treatment condition participants' level of critical motivation.

Overall, trend-level evidence suggests the intervention may indeed have bolstered academic performance and raised levels of CC, affecting critical motivation in particular. The medium effect sizes for GPA (d = .54) and for critical motivation (d = .56) suggest that the intervention is associated with increased academic performance and elevated levels of CC. Distributional differences in GPA and critical motivation, tested via independent samples Mann-Whitney U tests, were significant, reinforcing the interpretation that the intervention had a positive effect, raising participants' academic performance and CC simultaneously.

Given the non-significant differences in *critical reflection: perceived inequality*, *critical reflection: egalitarianism*, and *critical action: sociopolitical participation*, there is not evidence to suggest that the intervention had positive effects on these components of CC.[15] Of course, again, it is a possibility that this study was underpowered to detect significant differences in the *critical reflection* and *critical action* components of CC, should they actually have emerged as a result of participation in the intervention's treatment condition. As noted previously, in order to detect significant effects, given the final analytic sample sizes of the control (n = 28) and the treatment (n = 25) groups, effect sizes would have needed to be large, d = .80 (J. Cohen, 1988) in order for such differences to emerge.

[15] Relatedly, independent samples Mann-Whitney U tests confirmed that there were no significant distributional differences in these outcome variables as well.

CHAPTER FIVE

Summary and Conclusion

This project drew from social psychology and CC literatures to test if a CC-oriented values-affirmation intervention could be used to raise students' academic achievement and to foster students' CC simultaneously. As reported in Chapter 4, trend-level evidence shows promise that the intervention may have positive effects on students' academic performance and levels of CC. Specifically, the medium effect sizes for GPA (d = .54) and for critical motivation (d = .56) suggest that the intervention is, in fact, likely associated with increased academic performance and elevated levels of CC.

In this chapter, I aim to examine the implications of the CC-oriented values-affirmation intervention, considering points relevant to both the researcher and the practitioner communities. I also present some limitations of the study. Finally, I conclude by offering some next steps for this research and future directions for those interested in the use of an adapted values-affirmation intervention to support the development of CC.

Implications

In short, this study suggests promise in the use of an adapted, CC-oriented social psychological values-affirmation intervention to bolster students' academic performance. Participants in the analytic sample who participated in the treatment condition had a second semester GPA that was 0.31 points *higher* than those in the control condition (d = .54). Despite the small sample size (n = 53), this difference approached the level of significance using an independent samples t-test (p = .06) and reached significance when using bootstrapping procedures (p = .05). Because these tests can be unreliable with small sample sizes and when normality assumptions are violated, nonparametric testing was conducted in order to substantiate

these findings. Notably, nonparametric testing confirmed that the population distributions of the two groups were likely to be distinct ($p = .04$).

In terms of effects on academic performance, this intervention had comparable effects to the values-affirmation studies carried out by G. L. Cohen et al. (2006), on which this study was based. As theorized, it seems plausible that providing students with an opportunity to self-affirm through reflection on CC-related values has the same function (or operates via the same mechanism) as self-affirmation through reflection other values salient to one's identity. As with the standard values-affirmation interventions (G. L. Cohen et al., 2006; G. L. Cohen et al., 2009), the self-affirmation promoted through reflection on CC-related values presumably enhanced participants' self-resources, potentially allowing them to move beyond whatever salient social identity threats may have been operating in their school context—thus leading to enhanced academic performance.[16] The collection of evidence provided here suggests that this intervention was effective at bolstering the academic performance of those in the treatment condition.

In the same way, this study also suggests promise in the use of an adapted, CC-oriented social psychological values-affirmation intervention to bolster students' level of CC—which was previously thought to be slow to develop, stubborn, and subject to time- and labor-intensive processes. Specifically, when bootstrapping procedures were employed during independent samples t-test analyses, a mean difference approaching significance ($p = .08$) was found between the control group and the treatment group in terms of critical motivation. Specifically, the treatment group's critical motivation was 3.55 points higher than that of the control group ($d = .56$). Notably, nonparametric testing reinforced the trend-level evidence suggesting that the

[16] Recall that my initial study design called for the use of more extensive data analyses, e.g., hierarchical regression and/or ANOVA/ANCOVA, in order to test for group differences in study outcome variables. A larger, more robust sample size would have enabled such extensive analyses and more explicit examination of how the intervention might have differential effects for students of color. As noted elsewhere, such analyses will be the focus of subsequent trials of this intervention. For a preliminary exploration of effects by subgroup, see Appendix F.

intervention was associated with higher levels of critical motivation. Overall, the collection of evidence suggests that the intervention had a positive effect in raising treatment condition participants' level of CC, with particular effects on critical motivation.

Self-reflection on CC-related values provided participants with the opportunity to critically assess inequitable social conditions (Freire, 1973, 2000) and apparently prompted the development of motivation to redress such inequities. While the *critical reflection* and *critical action* components of CC were not affected by the intervention, increasing *critical motivation* may be a means to initiate the development of CC by enhancing an individual's agency and motivation to confront societal inequalities and produce sociopolitical change. Critical motivation is hypothesized to be a linkage between the reciprocal processes of critical reflection and critical action (Watts et al., 2011), so increasing *critical motivation* alone should not be considered unexciting or underwhelming. To be sure, there is potential that this intervention also had positive effects on *critical reflection: perceived inequality* and *critical action: sociopolitical participation*, but that these effects were too small to detect given the study's current analytic sample size.

Despite the ever-increasing popularity of using social psychological interventions to enhance targeted participants' academic performance, broad questions still exist about *for whom* and *under what conditions* social psychological interventions—including this one—actually promote positive effects. For example, one recent large-scale attempt to replicate the landmark intervention by G. L. Cohen et al. (2006) demonstrated only limited success, failing to replicate findings that the values-affirmation intervention increased academic performance for students of color (Dee, 2015). While Dee's replication study showed some positive effects for students in supportive classroom environments, in particular, the varied findings do prompt further questions

about *why*, *when*, and *for whom* such interventions are successful. This adapted, CC-oriented values-affirmation study is no exception. Future work in this area will need to continue to examine the psychological mechanisms affected by values affirmation as well as continue to explore who accrues benefits from the self-affirmation, specifically, and why.

At the very same time, other studies are emerging that demonstrate the success of large scale-up interventions—as opposed to smaller-scale interventions—to shape students' self-construal and attributions within the school context (e.g., Yeager et al., 2016). These emergent studies are demonstrating that social-psychological interventions can be effective at census or population levels as opposed to just with random samples and/or using random assignment. While this dissertation project employed random assignment of participants to study conditions, a larger sample size and a larger-scale implementation of the project would provide greater confidence in the results obtained here, if indeed replicated. Future trials of this adapted, CC-oriented intervention should strive for increased sample size so that more extensive sub-group analyses can be conducted, with greater power. The constraints of this study should leave us cautiously optimistic about the results reported here. That is, there is promise in this intervention to raise academic performance and CC—which is very exciting—but further research is needed to substantiate, verify, and extend the results of this study.

One of the premises of this dissertation project was that current social-psychological interventions have been shown to be useful for targeted participants, in that they have demonstrably positive outcomes for targeted participants—but that they are not implicitly useful in changing the context in which targeted students were situated. That is, while the interventions may have material psychological and academic benefits for the targeted participants, the threatening contexts in which students are situated are not necessarily changed by the

intervention. This study did not test changes to students' contexts, but its goal was to enhance academic performance while also changing participants' capacity to change their contexts, through the development of CC. This goal was lofty and yet, given the results, it was at least partially attained. Importantly, other studies are emerging that are using innovative analyses to demonstrate the potential for psychological interventions to promote positive effects on the environment (Powers et al., in press). Research focused on the use of psychological interventions to enhance youths' contexts should continue.

Practically, this study provides new evidence about the effectiveness of a CC values-affirmation intervention to bolster students' academic achievement. In a sense, this strengthens existing ties between CC and academic performance. Additionally, practitioners have new evidence about the possibility of supporting or enhancing CC development through brief in-class exercises. Because CC has been often thought of as very slow to develop, this study represents a significant innovation in how to foster a key dimension of positive youth development. The approach utilized here may be used to initiate the process of CC development in existing interventions or perhaps may supplement the important work of more established but time-intensive CC interventions—yet it should not replace them (Watts & Hipolito-Delgado, 2015). Further work in this area, using this intervention, could further inform the way teachers work to support youth development alongside their work to support academic achievement.

The scholarly significance of this work is manifold. This study explored if a CC values-affirmation intervention could be used to foster both academic performance as well as CC. It was the first experimental exploration of whether or not CC could be developed via social-psychological intervention. Through this study, researchers have new evidence—albeit preliminary—that self-affirmation focused on CC-oriented values can be effective. This study

also provides insights into how brief interventions might be structured to bolster students' academic achievement while raising their agency to address structural constraints and enhancing their capacity to change oppressive contexts at the same time.

Limitations

Broadly, this intervention was modeled after the values-affirmation intervention used by G. L. Cohen et al. (2006) to explore if self-affirmation might help mitigate the effects of stereotype threat for students suffering from such identity threats in school. The original intervention was presented to students as a typical class assignment and occurred within the course of a regular school day. Due to logistical constraints and administrative considerations relevant to the implementation of this study, students completed this study's intervention and survey exercises on the computer outside of their regular classrooms. For this reason, the exact conditions and context of administration are unknown. As a result, environmental factors may have had some unintended consequences or had undue influence on the study results.

Additionally, while it was intended that students complete their intervention exercises and the subsequent CCS independently, because the activities were sent to students via email, there can be no guarantee that students completed them without interaction with classmates. In this sense, interference or "spillover" (Gerber & Green, 2012) between the control condition and the treatment condition was possible, and this too could have had some unintended consequences or undue influence on the study results.

Logistically, due to administrator turnover, the primary data collection site identified for this study withdrew support during the very week that data collection was to begin. This withdrawal from the study resulted in a significant reduction in sample size. Conservatively, approximately 350 students would have participated in the study *de facto*, had the school not

withdrawn as a result of the school administrator's departure the week prior to school starting in Fall 2015. This site would have offered in-seat administration of the intervention and CCS, within the context of an ongoing educational program at the school. The withdrawal of this site as the project was getting underway was a significant loss to this study. While that loss does not negate the promising findings reported here, the significance of this study and the claims that can be made as a result of the analyses presented are no doubt tempered or constrained by the very small sample size, as well as the inability to conduct the extensive sub-group analyses that were initially planned.

Randomized controlled trials have been lauded as the "gold standard" of research for many years. As noted throughout, this study used random assignment to conditions for all participants in this study. However, in reality, a limited number of parents across the five school sites actually provided consent for their child(ren) to participate—and only a subset of those consented students actually chose to complete the activities associated with the intervention and the CCS. This is not a problem unique to this study, but it is an issue that has bearing on the results that were obtained. That is, while we can still make some cautiously optimistic claims about the intervention's impact on students' academic performance and CC, we cannot forget that selection bias may be informing these results. This problem bespeaks the need to move toward a census administration of this intervention, with a much larger sample size and more widespread implementation, in order to extend these analyses and our interpretation of the results.

The non-normal sampling distribution for a number of the study's outcome variables is another limitation of the study. When bootstrapping procedures were employed, a significant mean difference in second semester GPA was found, and a difference that approached

significance was found in critical motivation. Nonparametric testing confirmed these differences and reinforced the interpretation of such results. In the end, despite efforts to ensure a fairly large sample for this study, this study's analytic sample size was quite small. This small sample size informed the analyses conducted here and thus had an effect on the results obtained. This limitation, along with the others discussed here, necessitates further study in order to substantiate the statistically significant and practical differences observed in both the GPA and critical motivation outcomes.

Beyond these, there are at least four other limitations worth noting. First, this study was conducted with a sample of ninth and tenth grade students from a select number of charter high schools in the Midwestern United States. This period of adolescence is a poignant time for identity development and formation, including the development of ethnic-racial attitudes and self-appraisals, ethnic-racial classification and identification, and awareness of group-based stereotype, stigmatization, and group differences (García Coll et al., 1996; McKown, 2013; Phinney, 1990; Quintana, 1998). The fact that this intervention was administered during this developmental period—when CC may be burgeoning for marginalized youth, as they learn to situate their self-appraisals in light of the context of societal oppression (Quintana & Segura-Herrera, 2003)—may shape, in some ways, the observed effects on youths' CC development. Administration of the intervention at an earlier time, for example, when perceptions of inequality and egalitarian beliefs are less developed, could lead to stronger effects in terms of the development of those aspects of CC—though youth may not be developmentally ready to adopt such critical orientations during earlier stages of their ontogenesis. Similarly, administration of the intervention at a later time—e.g., during later adolescence or early adulthood, when identity formation is more complete—could result in null effects on any dimension of CC, critical

motivation included. The developmental trajectory of the adolescents in this study no doubt shaped the outcomes observed here. Future studies should consider this trajectory in order to continue to tease out how CC develops and operates over time, within adolescents of varying ages and across developmental periods.

Second, the recruitment sites were *charter* high schools as opposed to traditional district public schools, parochial schools, or private schools. It is not known how the results might differ for a sample drawn from a different population of students, e.g., ninth and tenth graders attending a typical urban district public school in the same geographic locations as the charter high schools that participated in this study. Charter schools may not represent normative contextual or familial influences on adolescents' academic performance or their development of awareness of and agency to change societal inequities. Charter schools may also have differential effects on students' academic achievement in the face of an intervention such as this, depending on the pedagogical approaches, teaching methodologies, or instructional foci they hold (see, for example, Seider et al., in press). Future intervention work should consider how this intervention may operate differently across varied school contexts—traditional public and charter public, as well as various private or parochial contexts—in order to examine how these contexts may shape the impacts on and experiences of study participants.

Third, this research (and other values-affirmation intervention research) hinges upon assumptions about the various social identity threats that individuals may encounter—for example, stereotype threat in school—based on various socio-demographic identity markers. Notably, it is not clear or fully known what perceived social identity threats were salient or relevant for the participants in this study. At the outset of this project, the adolescents who were expected to participate were much more ethnic-racially diverse than the final analytic sample

ended up being. While the participating students were drawn from schools with large populations of lower-income families, and while the overall student populations at the recruitment sites were composed predominantly of students of color, the final analytic sample included a greater proportion of White students than initially anticipated. For this reason, we do not really know the degree to which social identity threats were manifesting within these schools, or for these participants in particular. Moreover, because there is some variability in the ethnic-racial and socioeconomic demographics of the recruitment sites, the presumed social identity threats relevant to participating students may have played out in different ways for students across the various schools from which the participants were drawn. The significance of this cannot be overstated. The ethnic-racial and socioeconomic composition of a school shapes the way that youth experience the school context, along with their understanding of inequalities that operate within that context (Shedd, 2015).

Finally, the use of the academic performance measure of GPA may be limiting in terms of detecting treatment effects, as it may be a measure that lacks the sensitivity needed to detect such effects. Specifically, this measure is subject to range restrictions at the upper end of the GPA scale as a result of grade inflation (for a helpful discussion, see Yeager et al., 2016). This measure has also been shown to have systematic bias that results in the underestimation of the intellectual ability of students subject to social identity threats (Walton & Spencer, 2009). Intervention participants who were higher achievers at the start of the intervention may not have experienced demonstrable impacts on academic performance if their GPAs were already high and could not climb higher still. In addition to this, it may be that these participants, who were higher performing at the start, were most engaged in school and its activities, and therefore were most influenced by the intervention. Supplemental analysis focused on post-intervention scores

from the norm-referenced NWEA MAP assessments that were used to measure baseline performance could be useful in enhancing our understanding of *how* and *for whom* this intervention was actually effective. Future research should account for this potential lack of sensitivity of GPA by including other academic outcome performance measures when possible.

Directions for Future Research

While logistical and implementation-related constraints hampered the data collection for this study, there are a number of next steps that I have planned to extend the initial analyses presented here. Some of these next steps draw on the data already collected, while others represent continued data collection efforts. There are at least three directions I will take to extend this project.

First, I intend to re-run the experiment with additional schools and students. Data from this first trial will be pooled with data from the subsequent trials in order to generate greater sample size and increase power. This will allow for more extensive analyses of group differences, including subgroup differences, in terms of academic performance and CC. A few promising opportunities are being explored for subsequent administrations of this experiment.

Second, I am exploring possibilities and outlets to validate the measure of *critical motivation* used in this study. The data from this data collection may be pooled with data previously collected as well as data that will be collected subsequent to this implementation, in order to have a sufficient response set to validate the critical motivation scale (see Diemer, Rapa, Park, et al., in press).

Third, it may be possible to conduct a mixed-methods study to examine the narrative responses provided by intervention participants. There is some evidence suggesting that what students write about during values-affirmation interventions actually moderates the effects of the

interventions themselves (Shnabel et al., 2013). Exploring the narrative responses of those who participated in this study may provide some additional insights into the effectiveness of this CC-oriented values-affirmation intervention. Moreover, because questions persist about *for whom*, precisely, this intervention had effects, and because there are signs that some endogenous characteristics of those who participated may have contributed to the observed effects, there may be additional utility in examining these narrative responses. For example, an analysis of the top three values selected by White students and by students of color might reveal new insights into how the focus on certain values moderates the effectiveness of the intervention or might help us come to understand better for whom and under what conditions an intervention such as this one can have positive effects on academic performance and CC.

In addition to these research activities, I also intend to examine the relations between CC and academic achievement over time. As an ancillary project to this one, provided my relationships with the study sites for this dissertation project are maintained, I hope to track academic achievement longitudinally with the full sample of approximately 84 students who completed the initial intervention and also the 92 students who completed the CCS measure. Academic performance data (including GPA and NWEA MAP scores) will be gathered longitudinally, over the course of participants' high school years, in order to examine relations between the intervention, CC, academic performance, and perhaps even degree attainment.

As noted throughout this section, there are a number of things that researchers interested in this line of research should attend to as they take up this work. Specially, researchers should continue to examine the psychological mechanisms affected by values affirmation as well as continue to explore who accrues benefits from self-affirmation, specifically, and why. Those implementing this intervention in the future should strive to administer the intervention to a

larger sample size in order to provide greater confidence in the results obtained here, as well as to enable more extensive sub-group analyses to be conducted. Such research is needed to substantiate further the result of this study.

This study provides preliminary evidence that a social psychological intervention can be successful at elevating youths' level of CC, and research focused on the use of psychological interventions to enhancing youths' context should continue. Likewise, future research in this area should examine the way teachers work to support youth development alongside their academic achievement. Finally, this project was focused solely on measuring CC as a characteristic of the individuals who participated in the intervention. As mentioned previously, and as noted in recent scholarship (Sánchez Carmen et al., 2015), researchers need to continue to examine how CC is a characteristic of both individuals and communities, an individual or collective attribute. Future intervention research might even be extended to consider how both individual and collective levels of CC might be raised through brief values-affirmation activities focused on CC.

Conclusion

The results of this study suggest promise in the use of a CC-oriented values-affirmation intervention to enhance students' academic performance and foster CC simultaneously. Specifically, trend-level evidence suggests the intervention may have bolstered academic performance and raised levels of CC, or critical motivation in particular. The moderate effect sizes for GPA (d = .54) and for critical motivation (d = .56) outcomes suggest that the intervention is associated with increased academic performance and CC, though the non-normal distributions of these outcome variables suggested additional evidence was needed to substantiate this interpretation. Distributional differences in GPA and critical motivation, tested via independent samples Mann-Whitney U tests, were significant, which confirmed that the

intervention may indeed have had some positive effects in terms of raising participants' academic performance and level of CC.

Differences in *critical reflection: perceived inequality*, *critical reflection: egalitarianism*, and *critical action: sociopolitical participation* were non-significant, providing no evidence of intervention effects on these components of CC; however, these analyses may have been underpowered due to the small analytic sample used in the study. Ultimately, this field experiment holds implications for the fostering of CC, generally believed to be a slow and time-intensive process and suggests that it may be possible to utilize a values-affirmation intervention to bolster academic achievement and raise CC simultaneously.

APPENDICES

APPENDIX A

Pilot Test Cognitive Interview Questions

The following questions were used to guide an interview with pilot test participants after the completion of the intervention exercises.

For the pilot test participants who took the critical consciousness no affirmation condition exercise (i.e., the control condition):

- Part 1
  - Can you explain what part 1 of the exercise asked you to do?
  - What do you think is meant by the term *values*?
  - What was your thought process while completing part 1?
  - Was anything unclear about what you were asked to do for part 1?
  - Was anything unclear about what the values listed in part 1?
- Part 2
  - Can you explain what part 2 of the exercise asked you to do?
  - What was your thought process while completing part 2?
  - Was anything unclear about what you were asked to do for part 2?
- Part 3
  - Can you explain what part 3 of the exercise asked you to do?
  - What was your thought process while completing part 3?
  - Was anything unclear about what you were asked to do for part 3?

For pilot test participants who took the critical consciousness values affirmation treatment exercise (i.e., the treatment condition):

- Part 1
  - Can you explain what part 1 of the exercise asked you to do?
  - What do you think is meant by the term *values*?
  - What was your thought process while completing part 1?
  - Was anything unclear about what you were asked to do for part 1?
  - Was anything unclear about what the values listed in part 1?
- Part 2
  - Can you explain what part 2 of the exercise asked you to do?
  - What was your thought process while completing part 2?
  - Was anything unclear about what you were asked to do for part 2?
- Part 3
  - Can you explain what part 3 of the exercise asked you to do?
  - What was your thought process while completing part 3?
  - Was anything unclear about what you were asked to do for part 3?

APPENDIX B

Field Test "Form A"

Field test "Form A" reflected the contents of the *no affirmation* condition and examined by students during the field test in April 2015. The document provided to field test participants as "Form A" begins on the next page.

Form A

Today you'll be thinking about and writing some answers to a few questions about your ideas, your beliefs, and your life. There are no right or wrong answers. I'm just interested in hearing what you think. If you're not comfortable answering any of the questions that are asked or participating in this activity, you may choose to submit blank responses. This will not be graded, so there will be no penalty if you decide not to participate.

Below is a list of eleven values that some people have identified as important to who they are. First, read the entire list of values and think carefully about each one. Second, I'd like you to select the ***three values*** that are least important to you. Although several of the values on the list may not be important to you, be sure to only select the three values that you would consider to be the least important to you.

- Speaking up when:
    - Someone I know is teased or treated unfairly because of his/her race
    - I am teased or treated unfairly because of my race
    - Someone makes a sexist comment about girls
    - Someone I know is teased or treated unfairly due to sexism
    - I am teased or treated unfairly because of my sex
    - Someone I know is teased or treated unfairly because of their social class (for example, living in poverty or being rich)
    - I am teased or treated unfairly because of my social class
- Making sure all students in my school are treated fairly, no matter their race, sex, or social class
- Talking about important social or political issues with my friends, teachers, or family
- Protesting or demonstrating about an important social or political issue
- Supporting important social or political issues like human rights, gay rights, or women's rights

Next, look at the three values you picked as least important to you. Think about times when these values might be important to someone else. Then, in a few sentences, describe why these values might be important to someone else.

Focus on your thoughts and feelings, and don't worry about spelling, grammar, or how well your response is written. I'm just interested in your ideas and about why the three values you identified as least important to you might be important to someone else.

List the top two reasons why someone else would view the values you chose as important. Remember, there are no right or wrong answers and I am just interested in hearing what you think.

Indicate your level of agreement with the following statements about the values you identified.

Strongly Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Strongly Agree
1	2	3	4	5	6

1. These values have influenced some people's lives.

1 2 3 4 5 6

2. Some people try to live up to these values.

1 2 3 4 5 6

3. These values are an important part of who some people are.

1 2 3 4 5 6

4. Some people care about these values.

1 2 3 4 5 6

APPENDIX C

Field Test "Form B"

Field test "Form B" reflected the contents of the *affirmation* condition and examined by students during the field test in April 2015. The document provided to field test participants as "Form B" begins on the next page.

Form B

Today you'll be thinking about and writing some answers to a few questions about your ideas, your beliefs, and your life. There are no right or wrong answers. I'm just interested in hearing what you think. If you're not comfortable answering any of the questions that are asked or participating in this activity, you may choose to submit blank responses. This will not be graded, so there will be no penalty if you decide not to participate.

Below is a list of eleven values that some people have identified as important to who they are. First, read the entire list of values and think carefully about each one. Second, I'd like you to select the ***three values*** that are most important to you. Although several of the values on the list may be important to you, be sure to only select the three values that you would consider to be the most important to you.

- Speaking up when:
    - Someone I know is teased or treated unfairly because of his/her race
    - I am teased or treated unfairly because of my race
    - Someone makes a sexist comment about girls
    - Someone I know is teased or treated unfairly due to sexism
    - I am teased or treated unfairly because of my sex
    - Someone I know is teased or treated unfairly because of their social class (for example, living in poverty or being rich)
    - I am teased or treated unfairly because of my social class
- Making sure all students in my school are treated fairly, no matter their race, sex, or social class
- Talking about important social or political issues with my friends, teachers, or family
- Protesting or demonstrating about an important social or political issue
- Supporting important social or political issues like human rights, gay rights, or women's rights

Next, look at the three values you picked as most important to you. Think about times when these values were important to you. Then, in a few sentences, describe why these values you selected are important to you.

Focus on your thoughts and feelings, and don't worry about spelling, grammar, or how well your response is written. I'm just interested in your ideas and about why you selected as most important to you the three values that you did.

List the top two reasons why you selected the three values that you chose as most important. Briefly reflect on what opportunities you might have to live out these values at school, in your neighborhood, or in your community during this school year.

Indicate your level of agreement with the following statements about the values you identified.

Strongly Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Strongly Agree
1	2	3	4	5	6

1. These values have influenced my life.

1	2	3	4	5	6

2. In general, I try to live up to these values.

1	2	3	4	5	6

3. These values are an important part of who I am.

1	2	3	4	5	6

4. I care about these values.

1	2	3	4	5	6

APPENDIX D

Full-Scale Study Intervention Materials

The following intervention materials were used in this study. For ease of review, the intervention content is compiled below although formatting was adjusted during implementation, in order to facilitate online administration.

Critical Consciousness No Affirmation Condition (Condition 1: Control)
Page 1
Today you'll be thinking about and writing some answers to a few questions about your ideas, your beliefs, and your life. There are no right or wrong answers. I'm just interested in hearing what you think. If you're not comfortable answering any of the questions that are asked or participating in this activity, you may choose to submit blank responses. This will not be graded, so there will be no penalty if you decide not to participate.

Below is a list of eleven values that some people have identified as important to who they are. First, read the entire list of values and think carefully about each one. Second, I'd like you to select the ***three values*** that are least important to you. Although several of the values on the list may not be important to you, be sure to only select the three values that you would consider to be the least important to you.

- Speaking up when:
    - Someone I know is teased or treated unfairly because of his/her race
    - I am teased or treated unfairly because of my race
    - Someone makes a sexist comment about girls
    - Someone I know is teased or treated unfairly due to sexism
    - I am teased or treated unfairly because of my sex
    - Someone I know is teased or treated unfairly because of their social class (for example, living in poverty or being rich)
    - I am teased or treated unfairly because of my social class
- Making sure all students in my school are treated fairly, no matter their race, sex, or social class
- Talking about important social or political issues with my friends, teachers, or family
- Protesting or demonstrating about an important social or political issue
- Supporting important social or political issues like human rights, gay rights, or women's rights

Page 2

Next, look at the three values you picked as least important to you. Think about times when these values might be important to someone else. Then, in a few sentences, describe why these values might be important to someone else.

Focus on your thoughts and feelings, and don't worry about spelling, grammar, or how well your response is written. I'm just interested in your ideas and about why the three values you identified as least important to you might be important to someone else.

Page 3

List the top two reasons why someone else would view the values you chose as important. Remember, there are no right or wrong answers and I am just interested in hearing what you think.

Indicate your level of agreement with the following statements about the values you identified. (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree)

5. These values have influenced some people's lives.
6. Some people try to live up to these values.
7. These values are an important part of who some people are.
8. Some people care about these values.

Critical Consciousness Affirmation Condition (Condition 2: Treatment)

Page 1

Today you'll be thinking about and writing some answers to a few questions about your ideas, your beliefs, and your life. There are no right or wrong answers. I'm just interested in hearing what you think. If you're not comfortable answering any of the questions that are asked or participating in this activity, you may choose to submit blank responses. This will not be graded, so there will be no penalty if you decide not to participate.

Below is a list of eleven values that some people have identified as important to who they are. First, read the entire list of values and think carefully about each one. Second, I'd like you to select the ***three values*** that are most important to you. Although several of the values on the list may be important to you, be sure to only select the three values that you would consider to be the most important to you.

- Speaking up when:
    - Someone I know is teased or treated unfairly because of his/her race
    - I am teased or treated unfairly because of my race
    - Someone makes a sexist comment about girls
    - Someone I know is teased or treated unfairly due to sexism
    - I am teased or treated unfairly because of my sex
    - Someone I know is teased or treated unfairly because of their social class (for example, living in poverty or being rich)
    - I am teased or treated unfairly because of my social class
- Making sure all students in my school are treated fairly, no matter their race, sex, or social class
- Talking about important social or political issues with my friends, teachers, or family
- Protesting or demonstrating about an important social or political issue
- Supporting important social or political issues like human rights, gay rights, or women's rights

Page 2

Next, look at the three values you picked as most important to you. Think about times when these values were important to you. Then, in a few sentences, describe why these values you selected are important to you.

Focus on your thoughts and feelings, and don't worry about spelling, grammar, or how well your response is written. I'm just interested in your ideas and about why you selected as most important to you the three values that you did.

Page 3

List the top two reasons why you selected the three values that you chose as most important. Briefly reflect on what opportunities you might have to live out these values at school, in your neighborhood, or in your community during this school year.

Indicate your level of agreement with the following statements about the values you identified. (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree)

5. These values have influenced my life.
6. In general, I try to live up to these values.
7. These values are an important part of who I am.

I care about these values.

APPENDIX E

Critical Consciousness Scale

The Critical Consciousness Scale begins on the next page. Items 1-22 correspond with the original scale developed by Diemer et al. (in press), measuring *Critical Reflection: Perceived Inequality*, *Critical Reflection: Egalitarianism* and *Critical Action: Sociopolitical Participation*. Items 23-32 were collated from the authors' initial items and were designed to measure *Critical Motivation*.

Name: _____ **Date:** _____

Please respond to the following statements by circling how much you agree or disagree with each statement. For each statement, choose "Strongly Disagree," "Mostly Disagree," "Slightly Disagree," "Slightly Agree," "Mostly Agree," or "Strongly Agree."

Strongly Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Strongly Agree
1	**2**	**3**	**4**	**5**	**6**

1. Certain racial or ethnic groups have fewer chances to get a good high school education

1 2 3 4 5 6

2. Poor children have fewer chances to get a good high school education

1 2 3 4 5 6

3. Certain racial or ethnic groups have fewer chances to get good jobs

1 2 3 4 5 6

4. Women have fewer chances to get good jobs

1 2 3 4 5 6

5. Poor people have fewer chances to get good jobs

1 2 3 4 5 6

6. Certain racial or ethnic groups have fewer chances to get ahead

1 2 3 4 5 6

7. Women have fewer chances to get ahead

1 2 3 4 5 6

8. Poor people have fewer chances to get ahead

1 2 3 4 5 6

9. It is a good thing that certain groups are at the top and other groups are at the bottom

1 2 3 4 5 6

Strongly Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Strongly Agree
1	**2**	**3**	**4**	**5**	**6**

10. It would be good if groups could be equal

1	2	3	4	5	6

11. Group equality should be our ideal

1	2	3	4	5	6

12. All groups should be given an equal chance in life

1	2	3	4	5	6

13. We would have fewer problems if we treated people more equally

1	2	3	4	5	6

Please respond to the following statements by circling how often you were involved in each activity in the last year. For each statement, choose "Never did this," "Once or twice last year," "Once every few months," "At least once a month," or "At least once a week."

Never did this	Once or twice last year	Once every few months	At least once a month	At least once a week
1	**2**	**3**	**4**	**5**

14. Participated in a civil rights group or organization

1	2	3	4	5

15. Participated in a political party, club, or organization

1	2	3	4	5

16. Wrote a letter to a school or community newspaper or publication about a social or political issue

1	2	3	4	5

17. Contacted a public official by phone, mail, or email to tell him/her how you felt about a particular social or political issue

1	2	3	4	5

Never did this	Once or twice last year	Once every few months	At least once a month	At least once a week
1	**2**	**3**	**4**	**5**

18. Joined in a protest march, political demonstration, or political meeting

1 2 3 4 5

19. Worked on a political campaign

1 2 3 4 5

20. Participated in a discussion about a social or political issue

1 2 3 4 5

21. Signed an email or written petition about a social or political issue

1 2 3 4 5

22. Participated in a human rights, gay rights, or women's rights organization or group

1 2 3 4 5

Please respond to the following statements by circling how much you agree or disagree with each statement. For each statement, choose "Strongly Disagree," "Mostly Disagree," "Slightly Disagree," "Slightly Agree," "Mostly Agree," or "Strongly Agree."

Strongly Disagree	Mostly Disagree	Slightly Disagree	Slightly Agree	Mostly Agree	Strongly Agree
1	**2**	**3**	**4**	**5**	**6**

23. It is important for young people to speak out when an injustice has occurred

1 2 3 4 5 6

24. Young people have an important role to play in making the world a better place

1 2 3 4 5 6

25. It is important for young people to know what is going on in the world

1 2 3 4 5 6

26. Political issues are not relevant to people who are not old enough to vote

1 2 3 4 5 6

27. It is important to be an active and informed citizen

1 2 3 4 5 6

28. It is important to correct social and economic inequality

1 2 3 4 5 6

29. It is important to confront someone who says something that you think is racist or prejudiced

1 2 3 4 5 6

30. It is my responsibility to get involved and make things better for society

1 2 3 4 5 6

31. People like me should participate in the political activity and decision making of our country

1 2 3 4 5 6

32. It does not matter whether I participate in local organizations or political activity because so many other people are involved

1 2 3 4 5 6

APPENDIX F

Preliminary Subgroup Analysis

Table 12
Preliminary Subgroup Analysis by Outcome Variable, ERI Group, and Condition

Outcome Variable	ERI	Condition	*n*	*M*	*SD*	*t*	*df*	*p*
GPA	SOC	C	12	3.46	.60	–0.82	21	.42
		Tr	11	3.68	.69			
	White	C	16	3.23	.65	–2.05*	28	.05
		Tr	14	3.60	.32			
CR: PI	SOC	C	10	21.90	11.59	–0.46	18	.65
		Tr	10	24.60	14.63			
	White	C	9	20.33	10.76	0.25	20	.81
		Tr	13	19.23	10.04			
CR: E	SOC	C	10	27.30	3.30	0.53	18	.60
		Tr	10	26.50	3.47			
	White	C	12	25.33	6.13	–0.36	22	.72
		Tr	12	26.17	5.19			
CA: SPP	SOC	C	9	15.44	8.03	0.86	18	.40
		Tr	11	13.27	2.28			
	White	C	11	13.09	4.81	0.42	21	.68
		Tr	12	12.42	2.64			
CM	SOC	C	7	51.57	3.78	0.35	16	.73
		Tr	11	50.36	8.50			
	White	C	11	47.36	6.86	–3.35**	20	.003
		Tr	11	54.72	2.49			

Note. ERI = ethnic-racial identity; SOC = student of color; C = control group; Tr = treatment group; GPA = *grade point average*; CR: PI = *critical reflection: perceived inequality*; CR: E = *critical reflection: egalitarianism*; CA: SPP = *critical action: sociopolitical participation*; CM = *critical motivation*. Data may include outliers and violate normality assumptions.
*p = .05, **p < .01.

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