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PEER INFLUENCE IN GROUP MENTORING: A SOURCE OF PEER CONTAGION OR  
PROSOCIAL BEHAVIOR CHANGE?

By

HANNAH L. JOSEPH

Under the Direction of Gabriel Kuperminc, PhD

ABSTRACT

Group mentoring programs aim to foster supportive relationships with and receive constructive feedback from mentors and peers. Given the power of peer influence to promote adaptive and harmful outcomes, it is important to evaluate the role of peer influence on youth behavior in group mentoring. This study examined whether a history of negative behavior among mentor group peers exacerbated individual participants' behavior problems. A multi-level regression analysis was used to explore group-level influence on participant school suspensions and truancy using school administrative data records and mentee questionnaires. The effect of exposure to peers with a history of problem behaviors on both outcomes did not reach statistical significance. Neither quality of mentor relationship nor group climate moderated the effects of exposure to problem behavior on study outcomes. The results suggest that grouping youth with a history of poor attendance and suspensions did not inherently increase risk of truancy and suspensions.

INDEX WORDS: program evaluation, group mentoring, peer influence, adolescent development, truancy, suspensions

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by

HANNAH L. JOSEPH

A Thesis Submitted in Partial Fulfillment of the Requirement for the Degree of

Master of Arts

In the College of Arts of Sciences

Georgia State University

2018

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2018

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PROSOCIAL BEHAVIOR CHANGE?

by

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## 1 INTRODUCTION

Group mentoring describes a naturally occurring or programmatic setting wherein youth gather consistently over time with one or more adults or older peer group leaders for educational or recreational purposes (Kuperminc, 2016). Program goals may differ, varying in focus from specific tasks or skills (e.g. problem solving, coping, social skills) to relationship and developmental support, but the essential characteristic of group mentoring is that youth participants have the opportunity to foster supportive relationships with and receive constructive feedback from mentors as well as peers (Karcher, Kuperminc, Portwood, Sipe, & Taylor, 2006). In addition to building new relationships, a central aim of group mentoring is to cultivate a supportive group climate that promotes the positive development of participants (Kuperminc & Thomason, 2013).

Peer influence is an essential element of the mentor group climate intended to influence prosocial change (Kuperminc & Thomason, 2013), yet it is an understudied mechanism of program effects. Given the power of peer influence to promote both adaptive and harmful outcomes for youth (Allen & Antonishak, 2008), it is important to evaluate the role of peers in influencing youth behavior in the context of group mentoring. There is emerging evidence that group processes occurring in mentoring groups contribute to positive outcomes, such as empathy and a sense of school belonging (Joseph et al., 2017; Kuperminc & Cummings, 2010). Whereas the general term *peer influence* refers to a process that can lead to either positive or negative outcomes, peer contagion is the indirect peer influence process implicated in iatrogenic effects of group interventions, (i.e., unintended negative consequences or undermined positive outcomes) (Dishion & Dodge, 2005). This study builds on past peer contagion research to examine whether a history of negative behavior among group members undermines the problem behavior

prevention goals of a group mentoring program. Specifically, I examine whether the proportion of peer group members with a history of problem behavior prior to program participation predicts increased truancy and suspensions after group mentoring participation. I also evaluate whether other group characteristics (i.e. quality of relationship with mentor, group climate) moderate the association between the proportion of group members with a history of truancy or suspensions and individual group members' truancy or suspension.

### **1.1 What does research say about the effectiveness of group mentoring?**

Mentoring is ubiquitous in both informal settings where youth naturally gather (e.g. after-school centers and sports teams), and formalized where programming is designed explicitly to facilitate positive mentor-mentee experiences mentoring (e.g. Big Brothers Big Sisters of America). Nearly one third of mentoring occurs within the context of a group (Garringer, Kupersmidt, Rhodes, Stelter, & Tai, 2015). Extant research suggests that formalized group mentoring can effectively foster short-term improvements in a number of behavioral, emotional and attitudinal outcomes for youth, however longer-term effects are still understudied (Kuperminc, 2016).

Research has primarily focused on one-on-one mentoring with far fewer studies evaluating the effectiveness of group mentor programs (Karcher et al., 2006). Group mentoring has emerged as a cost-effective and resource-efficient method of providing more youth with support than one-on-one mentoring; however, research is only beginning to analyze how group mentoring works and under what conditions it is most effective (Kuperminc, 2016). Though a recent meta-analysis suggests that there were no significant differences between the effectiveness of one-on-one and group mentoring programs (DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011), limited study of the mechanisms of change within group mentoring programs

restricts group mentoring practitioners' ability to make empirically informed implementation decisions to improve effectiveness (Kuperminc, 2016).

## **1.2 How does group mentoring work?**

Drawing from developmental theory and research on social support and mutual help groups as well as group psychotherapy, Kuperminc and Thomason (2013) proposed that the mechanisms of group mentoring include the vertical (unequal) relationship with the mentor and the horizontal (mutual) group processes amongst mentees, such as connection, cohesion and mutual support (Karcher & Nakkula, 2011). Researchers hypothesize that these variables mediate the relationship between participation in group mentoring and achieving the target outcomes to promote positive youth development. The group context introduces the opportunity for social relational processes (e.g. group cohesion, belonging and group identity) that contribute to positive youth outcomes as well as social-cognitive skill and attitude development through group participation (Kuperminc, 2016). These processes can be compromised when full engagement—including participant level of interest and participation in group activities—of all members is not maintained (Kuperminc, 2016).

Though limited research has been conducted to evaluate the posited mechanisms of change, preliminary studies support this model of group mentoring (Kuperminc & Thomason, 2013). In a quasi-experimental evaluation of a group mentoring program to increase peer relationship quality and school engagement for high school students, Kuperminc and Cummings (2010) found that youth who reported a higher level of mutual help were more likely to experience an increase in their sense of school belonging and peer relationship quality, and those who felt more connected to their mentor experienced a greater increase in their interpersonal skills. A preliminary evaluation of *Project Arrive* (PA), the program evaluated in this study,

suggested that the group processes of mutual help, group cohesion and program engagement were related to gains in resilience assets including empathy, self-efficacy, hope, meaningful school participation and school support (Joseph et al., 2017). A cross-sectional, non-experimental study found that perceptions of group climate mediated the relationship between program participation and psychosocial development for participants in a group mentoring program (Garcia, 2007). In a qualitative non-experimental study, mentee perceived relationship quality with the mentor was found to be related to mentee satisfaction (Deutsch, Henneberger, Wiggins, & Lawrence, April, 2010). Findings from another non-experimental study linked change in youth attitudes towards adults, community, the future and cultural pride with perceived instrumental support from mentors (Murphy, Soto, & Gopez, 1997). Preliminary research supports the model with group social relational processes as the mechanisms of change for group mentor programs, however, further empirical evaluation of this process is needed.

### **1.3 Does peer contagion impact group mentoring?**

Since promoting positive peer influence is an aim of group mentoring, it is relevant and important to consider the possibility of unintended negative peer influences or peer contagion. Emerging research suggests that group mentoring may be particularly beneficial for youth who are exposed to higher levels of risk and studies to date have shown little evidence of iatrogenic effects of such interventions on youth problem behavior (Kuperminc, 2016; Kuperminc & Thomason, 2013). Still, little research has evaluated whether peer contagion affects group mentoring, thus suggesting that iatrogenic effects may still be possible in these settings. A recent meta-analysis of mentoring programs that target youth at risk for delinquent behavior found that structured mentoring programs have modest positive effects on delinquency, aggression, academic achievement and drug use (Tolan et al., 2013). However, this recent review did not



specifically examine group mentoring programs separately from one-on-one mentor programs to evaluate potential peer contagion effects of the group setting.

Recent research suggests that group mentoring can have positive effects on delinquent behavior for youth. A recent quasi-experimental study of *Campus Corps*, a group mentoring program for youth at high-risk for juvenile justice involvement, found that the frequency of problem behavior for youth participants was significantly lower after the program than for comparison youth with similar risk profiles. In that study, the program included a one-to-one mentoring component in addition to a group component, which the authors suggested helped to provide sufficient direct supervision to protect against peer contagion effects (Weiler et al., 2015). A randomized control trial of *Reading for Life*, a diversion program comprised of mentored reading groups for non-violent juvenile offenders, found participation in the program to significantly and greatly decrease future arrests (Seroczynski, Evans, Jobst, Horvath, & Carozza, 2016). A quasi experimental study of *Arches Transformational Mentoring*, a group mentoring program for young adults on probation, found participants were significantly less likely to be reconvicted of a crime relative to matched comparisons (Lynch, Esthappan, N.M., & Collazos, 2018). Qualitative and quantitative findings of the Arches evaluation suggest that peer influence was a powerful catalyst for positive behavior change.

Despite limited research documenting peer contagion in group mentoring programs, recent group mentoring implementation recommendations put forth by the National Mentoring Partnership highlight the risk of peer contagion (Garringer et al., 2015). The National Mentoring Partnership (2015) specifically recommended that “group-based mentoring programs should be cautious about recruiting and grouping together a large percentage of high-risk youth that engage in aggressive, delinquent, sexually risky or substance abuse behaviors” (p.19).

Since peer contagion may impact groups of youth that are aggregated based on their risk profiles (e.g. deviant behavior) (Gifford-Smith, Dodge, Dishion, & McCord, 2005), mentor groups brought together to support specific needs of the mentees may also be susceptible to peer contagion. For example, research suggests that school disengagement (e.g. poor academic performance and attendance) is not only related to dropping out of school, but is also cross-sectionally and longitudinally associated with serious problem behavior including violent criminal behavior and substance use (Henry, Knight, & Thornberry, 2012). Thus, when mentor groups are created for youth demonstrating school disengagement, they may be exposing the participants to other related risks, including deviant behavior.

Studies have not examined peer contagion in group mentoring directly, but a handful of studies documenting iatrogenic effects of participation in group mentoring on youth attitudes and behavior suggest the complexity of group processes at play and underscore the potential for negative outcomes. In one such instance, high school participants in the *Youth Development Program* experienced a significant decline in feelings of school belonging relative to comparison youth (Kuperminc & Thomason, 2013). Investigators reviewed mentors' process notes which indicated that these negative effects were limited to groups that had challenging discussions about racial issues in school and groups with low levels of cohesion (House, Alvarez-Jimenez, McCoy, Lapidus, & Kuperminc, 2006; Kuperminc & Cummings, 2010). Results of an evaluation of *Go Girls!* suggested that, despite general improvements in healthy behaviors, participants experienced a small increase in negative attitudes about healthy eating and exercise (Dowd, Chen, Jung, & Beauchamp, 2015; Dowd, Harden, & Beauchamp, 2015). The evaluation of *Twelve Together*, an afterschool program for dropout prevention in middle school students,

documented negative effects on English grades and course credit earned after participation in the program, however these effects were not detectable one year after follow-up.

Despite these few studies documenting negative effects of participation on youth attitudes and behavior, a recent literature review suggests that no extant research has identified negative peer effects on problem behavior in group mentoring (Kuperminc, 2016). Kuperminc (2016) noted that lack of findings in this area may be due to limited research assessing these potential effects using follow-up assessment. Moreover, existing evaluations have had limited statistical power (Kuperminc & Thomason, 2013) and have not consistently tracked program effects on juvenile offending (DuBois et al., 2011). As Kuperminc (2016) suggested in his recent literature review on group mentoring, peer contagion effects “cannot be ruled out until such processes receive more direct examination” (p.10). Given the limited literature documenting iatrogenic effects of peer contagion, and lack of studies examining negative peer influence processes in group mentoring programming, it is important to look to the peer contagion literature to examine how and why this phenomenon might be relevant.

#### **1.4 What is negative peer influence?**

Peer influence can be a powerful catalyst of positive or negative behavior change (Brechwald & Prinstein, 2011; Dishion & Tipsord, 2011), especially during adolescence when youth are neuroanatomically and socially vulnerable to such effects (Dishion & Tipsord, 2011; Spear, 2000; Steinberg et al., 2006). Peers can influence change across a range of behaviors including deviant conduct, depressive symptoms, eating problems and body image as well as academic motivation and achievement. Peer influence can be adaptive, for example by helping individuals learn workplace etiquette and what is socially appropriate in different relationships (Allen & Antonishak, 2008). However, when these influences are negative (e.g. encouraging

shoplifting or driving while intoxicated), they can lead adolescents to engage in behaviors that threaten their own health or cause harm to others (Allen & Antonishak, 2008). Research suggests that multiple forms of problem behavior during adolescence, including drug and alcohol use, high-risk sexual behavior and aggression, are linked to having friendships with adolescents who demonstrate deviant behavior (Dishion, 2000; Dishion & Tipsord, 2011; Patterson, Dishion, & Yoerger, 2000).

Researchers consider peer influence to involve two processes: homophily and socialization (Brechwald & Prinstein, 2011; Cohen & Prinstein, 2006; Dishion, 2013). Homophily describes how youth choose to be friends with those who engage in similar behavior; therefore, this line of research is most relevant to the study of naturally occurring peer networks (e.g. friendship dyads). In contrast, socialization refers to the process by which youth association with peers inspires behavior change (Prinstein & Dodge, 2008). Whereas a recent literature review revealed that most of the peer influence literature thus far has focused on peer processes in naturally occurring environments (Brechwald & Prinstein, 2011), this study will focus on the potential for negative peer influence within the context of a group intervention where the group composition is determined by the program and peer socialization is expected to contribute to intended benefits for participants.

When youth are aggregated in a group intervention, negative peer influence may result in iatrogenic effects such as exacerbated problem behavior or reduced intervention prevention effects in a phenomenon referred to as peer contagion (Boxer, Guerra, Huesmann, & Morales, 2005). The construct of peer contagion is defined differently across studies depending on the setting, population and outcome evaluated, but it generally refers to the indirect and often inadvertent peer influence or socialization process that is associated with iatrogenic outcomes of

group interventions (Dishion & Tipsord, 2011). When youth of a particular behavioral profile (e.g. engaged in antisocial, aggressive or deviant behavior) are aggregated, they may influence the group to adopt those behaviors (Boxer et al., 2005; Burleson, Kaminer, & Dennis, 2006; Gifford-Smith et al., 2005; Rulison, Gest, & Loken, 2013; Warren, Schoppelrey, Moberg, & McDonald, 2005; Weiss et al., 2005). From a developmental perspective, peer contagion has been defined as a process of mutual influence that may maintain and promote negative attitudes and behaviors (Hanish, Martin, Fabes, Leonard, & Herzog, 2005; Mahoney, Stattin, & Magnusson, 2001) and undermine the target youth's development (Dishion & Tipsord, 2011). As research aims have begun to focus on understanding the mechanisms of peer influence, some social scientists now define this process as deviancy training whereby peer interaction punishes or reinforces certain behaviors (Dishion, Nelson, Winter, & Bullock, 2004; Dishion, Poulin, & Burraston, 2001; Dishion, Spracklen, Andrews, & Patterson, 1996; Hanish et al., 2005; Snyder et al., 2005).

Research suggests that behaviors most vulnerable to peer contagion are antisocial and unhealthy behaviors (Brechwald & Prinstein, 2011) as well as those acquired through social processes (e.g. violence, substance use) (Dishion, Dodge, & Lansford, 2006). This study focuses on truancy and school suspensions, because these indicators of problem behavior could be affected by peer influence and they are behavioral problems that are recorded in the school context where PA mentoring groups are located. Prior research suggests that unsupervised time after school (Henry, 2007) and socializing with peers who engaged in delinquent behaviors are correlated with increased risk of truancy (Henry & Huizinga, 2007), which are factors that could be affected by participation in a group mentoring program. Suspension is also an important outcome to consider because, in addition to marking severe enough behavior to warrant this

disciplinary behavior, the outcome itself may make peers more susceptible to peer contagion. Both in-school and out-of-school suspensions remove students from the classroom and often result in increased time spent with other suspended peers, sometimes unsupervised by adults, thus making youth potentially further susceptible to negative peer influence (Dodge, Dishion, & Lansford, 2007).

Scholars have begun to document the effects of peer contagion in a number of contexts including classrooms, group psychotherapy and juvenile justice centers (Dodge et al., 2007); however, research is limited as to whether these effects extend into group mentoring (Kuperminc & Thomason, 2013). It remains possible that when groups include members with a history of deviant behavior, such composition can dilute intended benefits (Ang & Hughes, 2002) or even result in unintended negative consequences of an intervention (Dishion & Dodge, 2005).

### **1.5 Does peer contagion result in iatrogenic program effects?**

For the sake of financial and logistical feasibility, adolescents with delinquent behaviors are often put in settings together such as special education classrooms, therapy groups, alternative schools, and juvenile justice facilities. Aggregating youth with a history of high risk behavior may make these adolescents more susceptible to peer contagion effects (Dodge et al., 2007). However, given the limited study in this area, it is still difficult to determine the extent to which peer influence results in iatrogenic effects for group interventions with youth (Gifford-Smith et al., 2005).

Some literature reviews have documented the impact of peer contagion across different group interventions, settings, and outcomes (Dishion & Tipsord, 2011; Gifford-Smith et al., 2005); however, other studies of group treatment and group behavioral support interventions for youth and children found no iatrogenic effects (Burleson et al., 2006; Hektner, Brennan, &

August, 2017; Huefner, Handwerk, Ringle, & Field, 2009; Huefner & Ringle, 2012), suggesting that peer contagion may not result in harmful outcomes for every group intervention or setting. In fact, certain studies have demonstrated that there is an advantage to antisocial youth being placed in treatment groups with peers who have fewer symptoms (Ang & Hughes, 2002; Burleson et al., 2006; Hektner et al., 2017).

A comprehensive literature review and meta-analysis of the effects of group therapy for antisocial youth suggest that peer review journals are biased against publishing nonsignificant or negative results, making it difficult to determine the likelihood of harmful outcomes for group interventions (Gifford-Smith et al., 2005). Weiss and his colleagues (2005) suggest that the risk of peer contagion might be overstated in the literature, yet it is difficult to determine the extent of this potential problem without further research. Given the potential for harm to youth participants, mixed findings across populations, outcomes, settings, and interventions underscore the importance of further study. Further research about the mechanism of peer influence could help to identify risk for iatrogenic effects, understand how to mitigate these effects, and explore how peer effects can be harnessed to influence positive behavior change (Brechwald & Prinstein, 2011), which would permit program administrators to make evidence-informed decisions in structuring mentoring groups.

## **1.6 Theory**

Much of the theory behind peer influence is based on the assumption that adolescents are especially sensitive to and encouraged by positive regard and belongingness among peers (Brechwald & Prinstein, 2011). Developmental researchers emphasize the importance of peer influence during adolescence since peer interaction becomes more frequent during this time (Brown, Dolcini, & Leventhal, 1997), adolescents are motivated to develop a stable sense of

identity (Harter, Stocker, & Robinson, 1996), and they rely on peer feedback to inform their identity and self-evaluation (Hergovich, Sirsch, & Felinger, 2002).

Social learning theory can help to explain how people adopt new behaviors through the processes of modeling, social reward, punishment and observational learning of valued peers (Bandura & Walters, 1977). Peers may model new behavior and reinforce adoption or maintenance of those behaviors in a number of ways. Social status can serve as one such reward for adolescents adopting peer behaviors (Brechwald & Prinstein, 2011). Adoption of peer behavior may also be reinforced by reduction in risk of peer victimization (Dishion & Dodge, 2005). Deviancy training describes how peers may directly reinforce problem behaviors while socializing (e.g. by laughing or affirming the behaviors while talking) (Dishion & Dodge, 2005). Similarly, differential reinforcement theory describes negative peer influence by highlighting how youth with pro-delinquency attitudes can influence peers to engage in delinquent behavior (Sutherland, Cressey, & Luckenbill, 1992).

In addition to selective reinforcement of peer behavior, adolescent perception of peer social norms influences their behavior. Social psychology identity theory posits that youth establish a favorable sense of self by adhering to perceived social norms and emulating valued or idealized behavior of others (Abrams & Hogg, 1990; Festinger, 1954). However, youth may also fall prey to false consensus bias, wherein those who engage in problem behaviors overestimate these behaviors among their peers and thus reinforce their own problem behaviors (Dishion & Dodge, 2005).

The social development model integrates control theory, social learning theory and differential association theory to model youth behavior as patterns learned from their social environment (Hawkins & Weis, 1985). Following this model, whether behaviors are prosocial or



antisocial depends on the norms, values and behaviors of the individual's socialization unit, which includes a youth's family, school, peers and community (Catalano, Oesterle, Fleming, & Hawkins, 2004). Based on this model, youth are socialized in four ways: "1) perceived opportunities for involvement in activities and interactions with others; 2) actual involvement; 3) skill for involvement and interaction, and 4) perceived rewards from involvement and interaction" (Catalano, Oesterle, Fleming, Hawkins, 2004, p. 252). This theory supports the idea that school bonding can be an important place of intervention to promote prosocial and inhibit antisocial socialization processes (Catalano et al., 2004). Group mentoring may promote opportunities for involvement in group activities and social reward for such involvement to play a similar protective role as school bonding. However, simultaneous peer socialization may also reward antisocial behavior leading to peer contagion effects in the group mentoring context.

### **1.7 How is peer contagion measured in group intervention literature?**

The effects of peer contagion on group intervention outcomes have most commonly been measured one of three ways. First, meta-analysis has been used to compare effect sizes of different individual and group interventions to check for reduced benefits or harmful effects of group interventions (Ang & Hughes, 2002; Weiss et al., 2005). For example, Ang & Hughes (2002) conducted a meta-analytic review of social skills training interventions and compared the treatment effects of group interventions on externalizing problem behavior and social adjustment. The authors compared the effects of group intervention across different group compositions and found that youth in groups comprised entirely of individuals with a history of deviant behavior obtained smaller benefit from treatment compared to those in groups with a mix of youth with and without a history of deviant behavior. These results suggested a possible peer contagion effect in groups comprised entirely of youth with a history of problem behavior. A

second strategy to assess iatrogenic effects includes longitudinal tracking of participant outcomes before, during, and after the intervention to check for any unintended consequences of intervention participation (Huefner et al., 2009; Mahoney et al., 2001). It is through longitudinal analysis of the change in participant behavior that Mahoney and colleagues (2001) found that participation in programming at a Swedish youth recreation center was associated with increased criminal offending for boys.

The third, and perhaps most widely used strategy for assessing peer contagion in group interventions involves an aggregated measure of the group's problem behavior to predict an individual target youth's behavior over time (Boxer et al., 2005; Burleson et al., 2006; Huefner & Ringle, 2012; Warren et al., 2005). Boxer and colleagues (2005) calculated the mean pre-test aggression score of group participants which they used to represent exposure to aggression. By using this aggregated score of group baseline aggression to predict a target youth's aggression over time, Boxer and colleagues modeled how exposure to peer behavior influenced later youth behavior (Boxer et al., 2005). Warren and colleagues used a similar approach by predicting individual aggression from group mean aggression (2005). Other models predict target youth behavior from the "negative peer density" (the number of youth in the treatment setting with a history of problem behavior) (Huefner et al., 2009).

Research suggests that the makeup of the group with regards to history of problem behavior is an important indicator of peer contagion effects. Groups consisting of youth with heterogeneous risk profiles may be more resilient to iatrogenic effects. The *St. Louis Study* of group treatment for antisocial youth found that there was a correlation between exposure to problem behavior and an increase in these behaviors in participants. Specifically, participation in groups comprised entirely of boys who engaged in problem behavior was related to

an increase in antisocial behavior, whereas participation in groups comprised of a mix of boys who did and did not engage in problem behavior was related to a decrease in antisocial behavior. Moreover, youth who did not engage in problem behavior were not negatively affected by placement in a peer group with one or two high-risk youth (Dodge, Dishion, & Lansford, 2006; Feldman, 1992). The Ang & Hughes meta-analytic review of social skills training interventions cited above found that interventions delivered in groups of only antisocial peers produced smaller benefits than interventions delivered to a group comprised of a mix of prosocial and antisocial youth (Ang & Hughes, 2002).

### **1.8 Moderators of peer contagion**

Research has identified individual participant characteristics that may moderate peer contagion effects, including participant gender (Boxer et al., 2005; Brechwald & Prinstein, 2011; Hanish et al., 2005; Rulison et al., 2013; Veenstra, Dijkstra, Steglich, & Van Zalk, 2013), age (Brechwald & Prinstein, 2011; Gifford-Smith et al., 2005), psychological symptoms (Brechwald & Prinstein, 2011), self-regulation (Dishion & Tipsord, 2011), social rejection (Dishion & Tipsord, 2011), and peer social status (Brechwald & Prinstein, 2011; Cohen & Prinstein, 2006; Rulison et al., 2013). A comprehensive research report to inform child development public policy highlighted the need for future research to identify components of programs that are effective in mitigating peer contagion effects (Dodge et al., 2007). A recent literature review suggested that more theory-driven research is specifically needed to examine moderators relevant to peer contagion socialization processes in at-risk or clinical populations (Brechwald & Prinstein, 2011). In this study, I will focus on the mentor-mentee relationship quality and group climate as moderators of peer contagion since each could be points of intervention to alleviate potential negative effects.

### ***1.8.1 Mentor Relationship***

Mentoring research suggests that youth who perceive that they have a high-quality relationship with their mentor experience the best results from mentoring (DuBois et al., 2011; Jekielek, Moore, Hair, & Scarupa, 2002). In group psychotherapy theory, the strength of the relationship between participants and the therapist facilitator is central to promoting positive outcomes (Yalom, 1995). House and colleagues (2006) employed a partially nested multilevel model to evaluate a group mentoring program and found an iatrogenic effect of participating in *Youth Development Program* on feelings of school belonging, which was moderated by feeling connected to mentors and perceived mutual help. These negative effects were not apparent in groups where participants reported high levels of connectedness to mentors and feelings of mutual help (House et al., 2006; Kuperminc & Cummings, 2010). Theoretically, one of the mentor's roles is to promote and facilitate positive peer interactions (Kuperminc, 2016), though this relationship has not yet been empirically tested.

### ***1.8.2 Group climate***

Prior peer contagion research has considered group cohesion and the affinity to influential adolescent peers to be potential moderators of peer influence (Brechtwald & Prinstein, 2011; Gifford-Smith et al., 2005). Group cohesion has been shown to be associated with positive group therapy outcomes (Burlingame, McClendon, & Alonso, 2011) and preliminary research shows it may also be linked to positive group mentoring outcomes (Joseph et al., 2017). A sense of the group being mutually helpful to participants is a posited mechanism of group therapy (Yalom, 1995), which has been connected to positive outcomes amongst mutual help groups for adults with mental illness (Roberts et al., 1999) as well as in group mentoring (Kuperminc & Thomason, 2013). House and colleagues (2006) found that mentees' sense of mutual help

moderated the iatrogenic effects of group mentor program participation on perceived school belonging; participants in groups deemed to be more mutually helpful increased their perceived school belonging.

## **1.9 The Current Study**

In sum, research suggests that peer contagion is thought to occur in group settings where members are exposed to peers who have a history of problem behavior. However, there is insufficient literature to suggest that these effects negatively influence group mentor participants. This study evaluates potential peer contagion effects in a group mentoring program. Since group mentoring is common in schools, community centers and religious organizations across the country, understanding how group characteristics protect against negative outcomes could inform group mentoring program implementation efforts.

This study is part of a larger quasi-experimental evaluation of Project Arrive (PA), a group mentoring program designed for students at risk of dropping out of school. In this study, I explored whether peer contagion affects problem behavior within a group mentoring program and described which group characteristics might moderate such effects. Data analysis included two sources of data about participants in a school-based group mentoring program – school administrative records ( $N = 239$ ) and a student questionnaire ( $N = 114$ ). Two studies were conducted.

The aims of study 1 were as follows:

Aim 1.1 To examine group-level differences in suspensions or truancy after participating in a year-long group mentoring program; Aim 1.2 To examine whether individual participants who are grouped with a larger proportion of peers who have a history of problem behavior experienced a significant increase in problem behavior after participating in the program relative

to those in groups with a smaller proportion of peers who have a history of problem behaviors.

The aims of study 2 were as follows:

Aim 2.1 To assess whether group climate moderated the association between exposure to other group members with a history of problem behaviors and change in individual-level problem behavior after program participation; Aim 2.2 To assess whether the mentee's report of the quality of relationship with their mentors moderated the association between exposure to other group members with a history of problem behaviors and change in individual-level problem behavior after program participation.

## **2 METHOD**

### **2.1 Program Description**

Project Arrive is a group mentoring program that is designed to promote resilience among students identified as being at risk for dropping out of school. The program provides resources and facilitates support from adults and peers during 9th grade. Throughout their first year of high school, 41 mentor groups comprised of an average of eight students (ranging from two to 11) and two co-mentors met in a large, urban public school district on the West Coast of the U.S. PA mentors were primarily school employees (e.g. academic counselors, student advisors, school nurses, principals) at the high schools with some additional community members (e.g. police officer). Mentors implemented a flexible group mentoring curriculum, which included suggestions of discussion topics and group activities, tips on troubleshooting challenging group dynamics, and psychoeducation about topics related to transitioning to high school (e.g. developing a social network, navigating peer pressure, managing stress and promoting self-care). Mentors received training and had ongoing check-ins with the program coordinator to ensure familiarity with the curriculum and the program model. However, mentors

were free to adapt the curriculum to cater to the diverse needs and interests of student participants. Groups convened during the school day at times that did not interfere with core academic classes. Mentoring meetings were geared toward building positive relationships between peers and adults, developing a sense of belonging and safety within the larger school community, and getting consistent support to address barriers to academic and life success.

## 2.2 Study 1

### 2.2.1 Participants

Administrative Records were obtained for all PA participants ( $N = 239$ ) across 41 mentor groups. According to a simulation study assessing the sample size necessary for multilevel modeling, this study's sample includes too few ( $<50$ ) groups to conduct analysis of group-level effects, but a sufficient number of groups to generate an unbiased estimate of regression coefficients (Maas & Hox, 2004). The majority of study participants were male and identified as either Latinx/Hispanic, Asian/Pacific Islander or Black (see Table 1). Fourteen percent of the youth participants were unstably housed (e.g. living in a hotel, shelter or temporarily doubled up) and 1% reported being in foster care. The mean age of participants was 14.43 and there was an average of 7 mentees per group.

**Table 1. Demographic Characteristics of Study Participants in the Administrative Records sample ( $N = 239$ )**

	Means ( <i>SD</i> )	Freq. (%)
<i>Participant Characteristics</i>		
Sex		
Male		135 (56.5)
Female		104 (43.5)
Race/Ethnicity		
Latinx/Hispanic		128 (53.4)

Asian/Pacific Islander		26 (10.9)
Black		55 (23.0)
Other		8 (3.3)
Caucasian/White		10 (4.2)
Declined to report race		12 (5.0)
Age	14.43 (0.45)	
Unstably housed*		35 (13.6)
Youth in foster care in 8 <sup>th</sup> grade		3 (1.3)
<i>Group Characteristics</i>		
Group size	6.75 (1.95)	
Number of mentor groups		41 (100)

\*Includes those housed in a hotel or shelter and those temporarily doubled up

### **2.2.2 Procedure.**

**Recruitment.** Students were eligible for participation in PA if the school district's Early Warning Indicator (EWI) system had identified them as being at high risk for dropping out of school, based on a history of academic failure (GPA of less than 2.0) or truancy (instructional time less than 87.5%) during 8<sup>th</sup> grade. Students with significant risk factors for juvenile justice system involvement (e.g. youth in foster care, those receiving behavioral supports for recurring disciplinary problems) who participated in the Transitions Program (TP) were also deemed eligible for study participation. Both Georgia State University and the school district's Institutional Review Boards (IRBs) approved a waiver of informed consent in order to obtain de-identified school records for all students in the district who were eligible for PA participation (including PA program participants and comparison youth). Eligible students attending one of the four schools that chose to offer PA during 2013-14 and 2014-15 were invited to participate in PA and the research project.

### **2.2.3 Measures.**

**School Administrative Record.** Data were collected from the end of the year prior to participation in the program (8<sup>th</sup> grade) as well as fall and spring records for the year of



participation in the program (9<sup>th</sup> grade) and the follow-up year (10<sup>th</sup> grade). These data included participants' GPA, progress towards graduation, enrollment status, EWI and TP risk profiles, socio-demographic variables, instructional time and number of suspensions.

***Problem Behaviors.*** Participating students' suspensions and hours of instructional time per school year were provided in the Administrative Records. According to school district policy, students may be suspended when other behavioral disciplinary procedures have been exhausted and the principal determines that "the student's presence in school causes a danger to persons or property or threatens to disrupt the instructional process" (SFUSD, 2011, p. 56). Suspensions could be for reasons ranging from engaging in profanity to selling or using weapons or substances (SFUSD, 2011).

Instructional time represents the days that the student attended school as a function of the number of days enrolled. Instructional time was used as an indicator of truancy, with those who received less than 87.5% instructional time being considered "truant." This cut-point of instructional time was used to be consistent with the EWI risk factor for low attendance.

***Exposure to Other Group Members with Problem Behavior.*** To measure peer contagion, I calculated the proportion of mentor group members with a history of truancy or suspension prior to participation in the program for each participant. The problem behavior of the individual was excluded from this aggregated peer exposure variable in order to measure the discrepancy between the individual's behavior at baseline (which was included in each model as a covariate) and his/her peers on that behavior. In an approach similar to other peer contagion measures (Boxer et al., 2005; Huefner & Ringle, 2012), the exposure of each individual to group behavior at baseline was calculated as follows: the number of other group members with any history of suspensions or truancy (less than 87.5% instructional time) in the 8<sup>th</sup> grade was

summed (excluding the individual for which this is being calculated) and divided by the number of other members in that group.

In order to test for domain specific as well as cross-domain effects of suspensions and truancy, the proportion of other group members with problem behavior was calculated in two ways: 1) to measure whether other group members were suspended or truant separately (domain specific) and 2) to measure whether group members engaged in either behavior prior to participation (cross-domain). Recent studies suggest that peer influence of drug use and other criminal behavior could be domain specific (Cox, Criss, Harrist, & Zapata-Roblyer, 2017); however, given the limited study of peer effects with similar population and outcomes, this study tested both domain specific and cross-domain measures of exposure to other group members with problem behavior to further explore the nature of peer influence.

#### ***2.2.4 Data Analysis.***

Analysis was conducted to assess missing data patterns and attrition across groups that might bias estimates. Based on the assumption that data are missing at random, Multiple Imputation was used to account for missing data (Widaman, 2006). Individual level models were estimated within the multilevel framework, correcting for standard errors by clustering participants within mentor groups: youth participants (level 1) were nested within mentor groups (level 2). Eight multi-level regression models were used to assess suspensions and proportion of instructional time in 9<sup>th</sup> and 10<sup>th</sup> grade using the domain specific and cross-domain measures of proportion of other group members with problem behavior (see Table 2).

**Table 2. Description of Models Proposed for Study 1**

<b>Model</b>	<b>Exposure to Other Group Members with Problem Behavior Indicator</b>	<b>Dependent Variable</b>
1	Domain specific: Exposure to other group members who were suspended in the 8 <sup>th</sup> grade	Suspensions in 9 <sup>th</sup> grade
2	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Suspensions in 9 <sup>th</sup> grade
3	Domain specific: Exposure to other group members who were suspended in the 8 <sup>th</sup> grade	Suspensions in 10 <sup>th</sup> grade
4	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Suspensions in 10 <sup>th</sup> grade
5	Domain specific: Exposure to other group members who were truant in the 8 <sup>th</sup> grade	Proportion of instructional time in 9 <sup>th</sup> grade
6	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Proportion of instructional time in 9 <sup>th</sup> grade
7	Domain specific: Exposure to other group members who were truant in the 8 <sup>th</sup> grade	Proportion of instructional time in 10 <sup>th</sup> grade
8	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Proportion of instructional time in 10 <sup>th</sup> grade

**Note:** For every model, the 8<sup>th</sup> grade measure of the dependent variable was included as a covariate. Models of suspensions included participant gender, race, and special education participation as covariates. Models of truancy included participant gender as a covariate.

Due to the low base rate of suspensions in this sample, a logistic regression was employed to explore differences in whether group members were suspended in each school year. Due to the non-normality of the proportion of instructional time, the MLR estimator was used for the multi-level multiple regression models for that outcome. The indicators in each model were the same, including: the individual's 8<sup>th</sup> grade problem behavior, exposure to and other group members with problem behavior.

Covariates were included to control for demographic differences among mentor groups that might be associated with the outcomes. Gender, race, and special education status were included as covariates in models of suspension to control for what the literature suggests is likely to be disproportionate use of suspensions as a disciplinary action among male, Black, and Latinx students (Gregory, Skiba, & Noguera, 2010; Henry, 2007), as well as those with emotional,

behavioral or learning disabilities (Iselin, 2010; Raffaele Mendez, 2003). Gender was included as a covariate in the models of truancy to control for the fact that male students are more likely to skip school (McKinney, 2013).

In each of the models (see Table 2), intraclass correlations (ICC) were used to assess the extent to which individual differences between observations for each DV were attributable to differences between mentor groups. Determining the size of the ICC addressed the question of whether there is similarity among group members in their problem behaviors after participating in the PA program in 9<sup>th</sup> grade and 10<sup>th</sup> grade (Aim 1.1). See Table 3 for the specific research question answered by the ICC for each model.

**Table 3. Research Questions Answered by Intraclass Correlation for Each Model**

<b>Overall Research Question:</b> Is there similarity among group members in their patterns of change in problem behaviors from 8 <sup>th</sup> through 10 <sup>th</sup> grades?	
<b>Model Numbers</b>	<b>Research Question</b>
1 & 2	Is there significant between group variability in suspensions by the end of 9 <sup>th</sup> grade?
3 & 4	Is there significant between group variability in suspensions by the end of 10 <sup>th</sup> grade?
5 & 6	Is there significant between group variability in truancy by the end of 9 <sup>th</sup> grade?
7 & 8	Is there significant between group variability in truancy by the end of 10 <sup>th</sup> grade?

For each multi-level regression model, effect sizes and the regression weights of individual indicators were evaluated. In order to explore whether individual participants who were exposed to more problem behavior within their group experienced a significant change in problem behavior throughout the school year relative to those in groups with less exposure to problem behaviors (Aim 2 of Study 2), the effect size and regression weight associated with the indicators for proportion of other group members with problem behavior were examined.

**Table 4. Research Questions Answered by Effect Size and Regression Weight of the Exposure to Other Group Members with Problem Behavior Indicator for Each Model**

<b>Overall Research Question:</b> After controlling for individual problem behavior in the 8 <sup>th</sup> grade, is exposure to more group members with problem behaviors related to a significant change in likelihood of individual group members' problem behavior after participation in the program?	
<b>Model</b>	<b>Exposure to Other Group Members with Problem Behavior Indicator</b>
1	Is exposure to more group members who were suspended in the 8 <sup>th</sup> grade associated with an increase in the likelihood of being suspended in the 9 <sup>th</sup> grade, after controlling for whether the individual was suspended in the 8 <sup>th</sup> grade?
2	Is exposure to more group members who were either suspended or truant in the 8 <sup>th</sup> grade associated with an increase in the likelihood of being suspended in the 9 <sup>th</sup> grade, after controlling for whether the individual was suspended in the 8 <sup>th</sup> grade?
3	Is exposure to more group members who were suspended in the 8 <sup>th</sup> grade associated with an increase in the likelihood of being suspended in the 10 <sup>th</sup> grade, after controlling for whether the individual was suspended in the 8 <sup>th</sup> grade?
4	Is exposure to more group members who were either suspended or truant in the 8 <sup>th</sup> grade associated with an increase in the likelihood of being suspended in the 10 <sup>th</sup> grade, after controlling for whether the individual was suspended in the 8 <sup>th</sup> grade?
5	Is exposure to more group members who were truant in the 8 <sup>th</sup> grade associated with a decrease in the proportion of instructional time that the individual was in attendance for in the 9 <sup>th</sup> grade, after controlling for the proportion of instructional time that the individual was in attendance for in the 8 <sup>th</sup> grade?
6	Is exposure to more group members who were truant or suspended in the 8 <sup>th</sup> grade associated with a decrease in the proportion of instructional time that the individual was in attendance for in the 9 <sup>th</sup> grade, after controlling for the proportion of instructional time that the individual was in attendance for in the 8 <sup>th</sup> grade?
7	Is exposure to more group members who were truant in the 8 <sup>th</sup> grade associated with a decrease in the proportion of instructional time that the individual was in attendance for in the 10 <sup>th</sup> grade, after controlling for the proportion of instructional time that the individual was in attendance for in the 8 <sup>th</sup> grade?
8	Is exposure to more group members who were truant or suspended in the 8 <sup>th</sup> grade associated with a decrease in the proportion of instructional time that the individual was in attendance for in the 10 <sup>th</sup> grade, after controlling for the proportion of instructional time that the individual was in attendance for in the 8 <sup>th</sup> grade?

### 2.3 Study 2

After analyzing group-level differences in problem behaviors in Study 1, Study 2 examined which group processes might mitigate potentially negative effects of exposure to peers with a history of problem behavior. With a smaller sample including only the PA participants

who completed surveys, this study added the self-reported measures of group climate and quality of the mentor relationship as potential moderators of the relationship between exposure to other group members with problem behaviors and increased individual problem behaviors (which was evaluated in Study 1).

### ***2.3.1 Participants.***

The sample for Study 2 was comprised of a subset of PA participants (from Study 1), including only those whose parents consented to their participation in the survey and who completed the voluntary participant survey (midyear:  $n = 83$ ; year-end:  $n = 92$ ; total  $n = 114$ ). One reason for this smaller sample is that mentee surveys were not administered at all schools that provided PA programming. In cohort one, three of the four schools where PA programming was implemented administered mentee surveys, and in cohort two, four of the five schools where PA programming was implemented administered mentee surveys. Of the participating PA schools where surveys were administered, parental consent was not obtained for all youth mentees to participate in the survey. The slight majority of Study 2 participants were female and identified as either Latinx/Hispanic, Asian/Pacific Islander, or Black (see Table 5). The mean age of participants was 14.12. The majority of the sample was low income, and 12.4% were unstably housed. This sample represents mentees from 32 mentor groups.

**Table 5. Demographic Characteristics of Project Arrive Participants in the Sample for Study 2**

	Means ( <i>SD</i> )	Freq. (%)
<u><i>Participant Characteristics</i></u>		
Sex		
Male		53 (46.5)
Female		61 (53.5)
Race/Ethnicity		
Latinx/Hispanic		64 (56.1)
Asian/Pacific Islander		15 (13.2)
Black		20 (17.5)
Other		3 (2.6)
Caucasian/White		4 (3.5)
Age	14.12 (0.75)	
Unstably housed <sup>1</sup>		13 (12.4)
Low income		75 (71.4)
<u><i>Group Characteristics</i></u>		
Group size	7.42 (1.91)	
Number of mentor groups		32 (100)

<sup>1</sup>Includes those housed in a hotel or shelter and those temporarily doubled up

### **2.3.2 Procedure.**

**Recruitment.** Informed consent was obtained from the parents of all PA program participants prior to survey administration. After parental consent was obtained, PA student participants who attended participating schools were invited to complete surveys in the beginning, middle and end of their ninth-grade year (though this study will only use data from the mid-year and year-end surveys which contained measures of group climate). Online assent forms informed participants of the study procedures as well as associated risks and benefits of participation. The assent form also notified students that their participation was voluntary and that they had the right to withdraw at any time.

**Data Collection.** Data were collected to evaluate the intervention across two cohorts of mentees, those participating in the 2013-2014 and those participating in the 2014-2015 academic years. Surveys were administered online to consenting group mentoring participants during a 40-

minute class period via a secure internet-based platform midway through the year long program and after a year of program participation. Survey administration was supervised by an evaluation research consulting firm.

### **2.3.3 Measures.**

Student demographic and problem behavior data were obtained from the school administrative records. The dependent variables in this study were the same as for Study 1 (whether participants were suspended in 9<sup>th</sup> and 10<sup>th</sup> grades and the proportion of instructional time for which participants were in attendance in the 9<sup>th</sup> and 10<sup>th</sup> grades). Additionally, the same measures of the exposure to other group members with problem behavior used in Study 1 were employed for Study 2.

***Quality of Mentor Relationship.*** This measure describes the mentees' perception of their connectedness with their mentor using four items, including items like, "My mentor(s) care about me." Mentees rate statements about how they feel about their mentor/group leader on a scale from (1) *Not at all true* to (4) *Very much true*. This measure has previously been used to assess mentor-mentee relationships (Kuperminc, 2012) and demonstrated adequate reliability in this study ( $\alpha=.85$ ).

***Group Climate.*** This 11-item measure describes the mentees' perception of how supportive their mentor group feels overall on a scale from Not a lot (1) to Very much (4). These items have been used in previous youth mentoring research (Brezina, Kuperminc, & Tekin, 2016; Kuperminc, 2012; Kuperminc & Lesesne, 2009). Items assess mentee feelings of connectedness and belonging (e.g. "Kids in this group care about each other"), mutual help (e.g. "How much did the group help you to deal with everyday problems?"), and engagement (e.g.



“When you are with your group, how much do you enjoy the activities you participate in?”). This measure of overall group climate demonstrated adequate reliability in this study ( $\alpha=.90$ ).

#### **2.3.4 Data Analysis.**

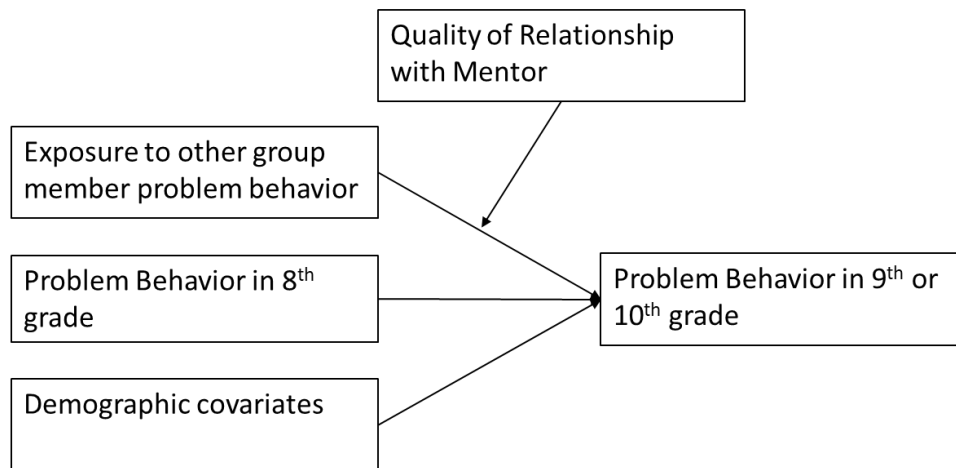
Analyses were conducted to assess missing data patterns and attrition across groups that might bias estimates. Using mid-year survey responses as well as other demographic variables, the multiple imputation feature of MPlus was used to impute missing student responses to the variables in the year-end survey. Individual level models were estimated within the multilevel framework, correcting for standard errors by clustering participants within mentor groups: youth participants (level 1) were nested within mentor groups (level 2). In order to assess whether certain group characteristics might mitigate potentially negative effects of exposure to peers with a history of problem behavior, sixteen multi-level regression models were used to test the two moderators of the relationship between exposure to other group members with problem behavior and the dependent variables (suspensions and proportion of instructional time in 9<sup>th</sup> and 10<sup>th</sup> grades). Youth’s ratings of the quality of their relationship with their mentor and of the group climate were evaluated as moderators. All models were tested with two measures of exposure to other group members with problem behavior: domain specific and cross domain measures of suspensions and truancy (described in Study 1).

**Table 6. Description of Models Proposed for Study 2**

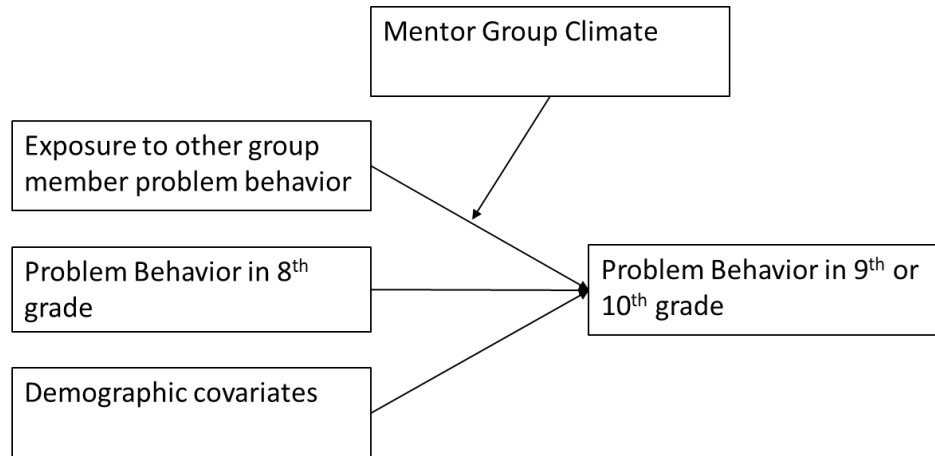
Model	Indicator	Moderator	Outcome
1	Domain specific: Exposure to other group members who were suspended in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Suspensions in the 9 <sup>th</sup> grade
2	Domain specific: Exposure to other group members who were suspended in the 8 <sup>th</sup> grade	Group Climate	Suspensions in the 9 <sup>th</sup> grade
3	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Suspensions in the 9 <sup>th</sup> grade
4	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Group Climate	Suspensions in the 9 <sup>th</sup> grade
5	Domain specific: Exposure to other group members who were suspended in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Suspensions in the 10 <sup>th</sup> grade
6	Domain specific: Exposure to other group members who were suspended in the 8 <sup>th</sup> grade	Group Climate	Suspensions in the 10 <sup>th</sup> grade
7	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Suspensions in the 10 <sup>th</sup> grade
8	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Group Climate	Suspensions in the 10 <sup>th</sup> grade
9	Domain specific: Exposure to other group members who were truant in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Proportion of instructional time in 9 <sup>th</sup> grade
10	Domain specific: Exposure to other group members who were truant in the 8 <sup>th</sup> grade	Group Climate	Proportion of instructional time in 9 <sup>th</sup> grade
11	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Proportion of instructional time in 9 <sup>th</sup> grade
12	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Group Climate	Proportion of instructional time in 9 <sup>th</sup> grade
13	Domain specific: Exposure to other group members who were truant in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Proportion of instructional time in 10 <sup>th</sup> grade
14	Domain specific: Exposure to other group members who were truant in the 8 <sup>th</sup> grade	Group Climate	Proportion of instructional time in 10 <sup>th</sup> grade
15	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Quality of Relationship with Mentor	Proportion of instructional time in 10 <sup>th</sup> grade
16	Cross-domain: Exposure to other group members who were suspended or truant in the 8 <sup>th</sup> grade	Group Climate	Proportion of instructional time in 10 <sup>th</sup> grade

**Note:** For every model, the 8<sup>th</sup> grade measure of the dependent variable was included as a covariate. Models of suspensions included participant gender, race, and special education participation as covariates. Models of truancy included participant gender as a covariate.

Due to the non-normality of the proportion of instructional time, the MLR estimator was used for the multi-level multiple regression models for that outcome. The indicators in each model were the same, including: the individual's 8<sup>th</sup> grade problem behavior, exposure to other group members with problem behavior, quality of relationship with mentor and group climate. Additionally, as in Study 1, gender, race, and participation in special education were included as covariates in models of suspensions. Gender was included as a covariate in models of truancy. For each multi-level regression model, effect sizes and individual indicator beta weights were evaluated.



**Figure 1. Model of Quality of Relationship with Mentor Moderating Relationship Between Exposure to Other Group Members' Problem Behavior and Problem Behavior in 9<sup>th</sup> or 10<sup>th</sup> Grade**



**Figure 2. Model of Group Climate Moderating Relationship Between Exposure to Other Group Members' Problem Behavior and Problem Behavior in 9th or 10th Grade**

### 3 RESULTS

#### 3.1 Study 1

##### 3.1.1 Preliminary Analyses.

Means and standard deviations of all Study 1 variables are displayed in Table 7. On average, participants tended to have unexcused absences that amounted to around 10% of their total instructional time in the 8<sup>th</sup> and 9<sup>th</sup> grades, however, the average 10<sup>th</sup> grade participant tended to miss closer to 20% of instructional time. From 8<sup>th</sup> to 10<sup>th</sup> grades, on average, fewer than 20% of participants were suspended. On average, mentor groups included between 6 and 7 mentees, of which 26% had a history of being truant or suspended in the 8<sup>th</sup> grade (about 10% with a history of truancy and about 10% with a history of any suspensions). Mentor groups ranged in composition from 0 to 67% of mentees with a history of being truant or suspended in the 8<sup>th</sup> grade.

### ***3.1.2 Missing Data.***

Study variables had 0 to 22.6% missing data. Little's Missing Completely at Random (MCAR) test was not significant, which suggested that the missing data were MCAR,  $\chi^2(41) = 53.47, p = .092$ . Multiple imputation was used in MPlus Version 7.4 to create 20 datasets (Bodner, 2008; Graham, Olchowski, & Gilreath, 2007) with complete data for the full sample of 239 participants. The multiple imputation model included instructional time and suspensions in all three grades as dependent variables.

### ***3.1.3 Baseline Differences between Mentor Groups.***

Preliminary analyses assessed for baseline differences between mentor groups on study outcomes by evaluating intraclass correlations (ICC) in the 8<sup>th</sup> grade, before mentor groups were assembled (see Table 7). The ICC for instructional time and suspensions in 8<sup>th</sup> grade was substantial (0.270 and 0.170, respectively), suggesting some between- group variance existed at baseline when the mentoring groups were assembled. This group-level shared variance indicates that, mentees may have been grouped with peers who had similar attendance rates with a similar history of suspensions before entering the program. The ICC for instructional time and suspensions decreased from 8<sup>th</sup> to 9<sup>th</sup> grades and from 8<sup>th</sup> to 10<sup>th</sup> grades, suggesting no group-level effects of participation on instructional time or likelihood of suspensions.

**Table 7. Range of Scores, Means, Standard Deviations and Intraclass Correlations for Primary Study 1 Measures**

	Range	N (%)	Mean (SD)	Intraclass Correlation
<i>Outcomes</i>				
Instructional Time				
8 <sup>th</sup> grade	72.04-99.92		91.90 (3.73)	0.270
9 <sup>th</sup> Grade	57.38-99.76		89.33 (4.36)	0.170
10 <sup>th</sup> Grade	27.33-100.00		82.45 (7.14)	0.168
Suspensions				
8 <sup>th</sup> Grade	0-9		0.19 (0.25)	0.126
9 <sup>th</sup> Grade	0-7		0.13 (0.08)	0.028
10 <sup>th</sup> Grade	0-6		0.16 (0.11)	0.029
<i>Exposure Variables</i>				
Cross-Domain Exposure 8 <sup>th</sup> grade	0-0.67		0.26 (0.18)	
Domain specific exposure 8 <sup>th</sup> grade				
Truancy	0-0.67		0.17 (0.15)	
Suspension	0-0.67		0.14 (0.15)	
<i>Covariates</i>				
Sex, <i>N (%)</i>				
Female		104 (43.5)		
Male		135 (56.5)		
Black, <i>N (%)</i>				
		55 (23.0)		
Hispanic, <i>N (%)</i>				
		128 (53.6)		
Special Education, <i>N (%)</i>				
		61 (25.5)		
Age in 8 <sup>th</sup> grade			13.43 (0.46)	

### 3.1.4 Correlations among Study Variables.

See Table 8 for correlations among all Study 1 variables. Among the demographic covariates, Black students received less instructional time than other students and Black and Latinx students were more likely to be suspended than other students. Students in Special Education (SPED) received more instructional time and less domain specific exposure to truancy. Male students received more suspensions than female students. Instructional time was highly correlated across all three grades, suggesting high intra-individual stability over time. Instructional time from baseline through one-year follow-up was moderately to highly correlated

with the cross-domain exposure and domain specific exposure to truancy variables. The number of suspensions students received in 8<sup>th</sup> grade was not significantly correlated with suspensions in the latter two grades, however the number of suspensions received in 9<sup>th</sup> and 10<sup>th</sup> grades were strongly correlated. Suspensions in 8<sup>th</sup> grade were strongly correlated with cross-domain exposure and domain-specific exposure to peer suspensions. There was also a small correlation between the number of suspensions in 9<sup>th</sup> grade and the cross-domain exposure variable.

### ***3.1.5 Primary Analyses.***

The clustered regression models were fully saturated, therefore no model fit indices were reported. The estimated effects of domain specific or cross-domain exposure on suspensions or instructional time in the 9<sup>th</sup> or 10<sup>th</sup> grades were small and did not reach statistical significance.

**Table 8. Correlations among All Study 1 Variables**

	1	2	3	4	5	6	7	8	9	10	11	12
1. Black	1											
2. Hispanic	-0.55	1										
3. SPED	0.33	-0.10	1									
4. Sex	0.07	0.10	-0.04	1								
5. IT 8th grade	-0.19	-0.03	-0.12	-0.10	1							
6. IT 9th grade	-0.14	0.02	-0.03	-0.05	0.53	1						
7. IT 10th grade	-0.20	0.15	-0.12	0.03	0.33	0.56	1					
8. S 8th grade	0.01	0.02	-0.07	0.02	-0.20	-0.25	-0.12	1				
9. S 9th grade	0.18	-0.13	0.15	-0.02	-0.24	-0.24	-0.20	0.02	1			
10. S 10th grade	0.11	-0.07	0.06	-0.16	0.02	-0.13	-0.07	0.13	0.17	1		
11. CDE	-0.14	0.01	-0.09	-0.11	0.58	0.38	0.27	-0.30	-0.19	-0.05	1	
12. DSE truancy	-0.15	-0.02	-0.15	-0.10	0.76	0.44	0.29	-0.08	-0.21	0.03	0.70	1
13. DSE suspensions	-0.05	0.03	0.06	-0.03	0.10	0.17	0.10	-0.48	-0.07	-0.11	0.65	0.07

*Note:*  $N = 239$ ; S= Suspensions; IT = Instructional time; CDE = Cross-domain exposure; DSE = Domain specific exposure; Correlations larger than 0.127 are significant at  $p = 0.05$  level and correlations larger than 0.17 are significant at  $p = 0.01$



**Table 9. Results of multiple regression of 9th grade suspensions on exposure to peer behavior (Models 1-2)**

	Model 1				Model 2			
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR
DSE	0.677 (1.158)	[-1.23, 2.58]	0.05	1.05	—	—	—	—
CDE	—	—	—	—	0.014 (1.034)	[-1.686, 1.715]	0.00	1.00
Susp. 8 <sup>th</sup> grade	0.322 (0.196)	[-0.00, 0.65]	0.12	1.12	0.331 (0.196)	[0.009, 0.653]	0.12	1.13
Sex	0.184 (0.460)	[-0.57, 0.94]	0.05	1.05	0.220 (0.470)	[-0.553, 0.994]	0.06	1.06
Black	-0.165 (0.558)	[-1.08, 0.75]	-0.04	0.97	-0.137 (0.551)	[-1.043, 0.769]	-0.03	0.97
Hispanic	-1.064 (0.503)*	[-1.89, -0.24]	-0.27	0.76	-1.066 (0.516)*	[-1.914, -0.217]	-0.27	0.76
Special Education	1.289 (0.504)*	[0.46, 2.12]	0.28	1.33	1.283 (0.510)*	[0.443, 2.122]	0.28	1.33

Note for all subsequent Study 1 tables: DSE = Domain specific exposure; CDE = Cross-domain exposure; \* $p < .05$ , \*\* $p < .01$

**Table 10. Results of multiple regression of 10th grade suspensions on exposure to peer behavior (Models 3-4)**

	Model 3				Model 4			
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR
DSE	0.065 (1.379)	[-2.20, 2.33]	0.00	1.01	—	—	—	—
CDE	—	—	—	—	-1.729 (1.252)	[-3.79, 0.33]	-0.17	0.84
Susp. 8 <sup>th</sup> grade	0.486 (0.322)	[-0.44, 1.02]	0.19	1.20	0.521 (0.340)	[-0.04, 1.08]	0.20	1.22
Sex	-0.467 (0.440)	[-1.19, 0.26]	-0.12	0.88	-0.420 (0.432)	[-1.13, 0.29]	-0.11	0.90
Black	0.484 (0.534)	[-0.39, 1.36]	0.11	1.11	0.596 (0.540)	[-0.29, 1.48]	0.13	1.14
Hispanic	0.062 (0.452)	[-0.68, 0.81]	0.02	1.02	0.095 (0.453)	[-0.65, 0.84]	0.03	1.03
Special Education	-0.253 (0.562)	[-1.18, 0.67]	-0.06	0.94	-0.352 (0.589)	[-1.32, 0.62]	-0.08	0.92

**Table 11. Results of multiple regression of 9th grade instructional time on exposure to peer behavior (Models 5-6)**

	Model 5			Model 6		
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$
DSE	4.900 (4.433)	[-2.39, 12.19]	0.08	—	—	—
CDE	—	—	—	4.278 (3.428)	[-1.36, 9.92]	0.08
Inst. time in 8 <sup>th</sup> grade	0.757 (0.099)**	[0.59, 0.92]	0.57	0.761 (0.100)**	[0.60, 0.93]	0.57
Sex	-0.477 (1.465)	[-2.89, 1.93]	-0.02	-0.510 (1.468)	[-2.93, 1.91]	-0.03

**Table 12. Results of multiple regression of 10th grade instructional time on exposure to peer behavior (Models 7-8)**

	Model 7			Model 8		
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$
DSE	15.881 (8.339)	[2.16, 29.60]	0.16	—	—	—
CDE	—	—	—	13.744 (7.019)	[2.23, 25.32]	0.16
Inst. time in 8 <sup>th</sup> grade	0.694 (0.240)**	[0.30, 1.09]	0.32	0.709 (0.241)**	[0.31, 1.11]	0.32
Sex	-0.763 (2.718)	[-5.23, 3.71]	-0.02	-0.815 (2.708)	[-5.27, 3.64]	-0.03

## 3.2 Study 2

### 3.2.1 Preliminary Analyses.

Means and standard deviations of all Study 2 measures are displayed in Table 13. Mean estimates of study outcomes were similar to Study 1 estimates. Mentees tended to rate the quality of their relationship with their mentors and their group climate very highly (close to the highest ratings on those scales).

### 3.2.2 Missing Data.

Study variables had 0 to 20.18% missing data. Little's Missing Completely at Random (MCAR) test was significant, thus it was not possible to determine whether these data were MCAR,  $\chi^2(75) = 111.697, p = .004$ . These data were not MCAR, nevertheless multiple imputation was used in MPlus Version 7.4 to create 20 datasets (Bodner, 2008; Graham et al., 2007) under the assumption that the data were missing at random. Multiple imputation was used to create complete data for the sample of 114 participants who filled out a mentee survey midway or at the end of their 9<sup>th</sup> grade year. The dependent variables in the model using imputed data included instructional time and suspensions in all three grades, as well as quality of mentor relationship and group climate.

### 3.2.3 Baseline Differences between Mentor Groups.

Preliminary analyses assessed whether there were differences in outcome variables between PA participants who completed the mentee survey and those who did not. Results suggested that there were no significant differences in 8<sup>th</sup> grade suspensions between those who completed mentee surveys and those who did not,  $t(161.44) = -1.463, p = .145$ . However, PA participants who were surveyed had significantly more 8<sup>th</sup> grade instructional time ( $M = 93.00$ ,

$SD = 6.31$ ) than those who were not surveyed ( $M = 90.82$ ,  $SD = 8.25$ ),  $t(189.724) = 2.091$ ,  $p = .038$ . It is possible that those who attended less school were less likely to be present at school during data collection and those who attended less often were more disconnected and therefore were less likely to consent to participate in the survey portion of the study. This discrepancy indicates that the sample of Study 2 likely under-represents highly truant students, therefore results should be interpreted with caution.

### ***3.2.4 Correlations among Study Variables.***

See Table 14 for correlations among all Study 2 variables. Given that the Study 2 sample included a subset of the same participants from the Study 1 sample, the correlations among the same outcome and indicator variables were similar to those described in Study 1. Study 2 includes two additional variables as moderators; there was a small negative association between group climate and instructional time in 8<sup>th</sup> grade and between quality of relationship with mentor and suspensions in 8<sup>th</sup> grade.

### ***3.2.5 Primary Analyses.***

The clustered regression models were fully saturated, therefore no model fit indices were reported. There were no statistically significant main effects of quality of mentor relationship or group climate on suspensions or instructional time in the 9<sup>th</sup> or 10<sup>th</sup> grades. The main effects of both moderators on both outcomes were small (ranging from  $\beta < 0.00$  to  $\beta = -0.24$ ) and failed to reach statistical significance. Additionally, there were no statistically significant moderation effects of either moderator (quality of mentor relationship or group climate) on either the domain specific or cross-domain exposure variables. Due to the high number of parameters and limited

number of mentor groups and number of mentees per group, it was not possible to assess for level 2 effects of exposure or moderator variables.

**Table 13. Range of Scores, Means, Standard Deviations and Intraclass Correlations for Primary Study 2 Measures**

	Range	N (%)	Mean (SD)	Intraclass Correlation
<i><u>Outcomes</u></i>				
Instructional Time				
8 <sup>th</sup> grade	72.04-99.64		92.54 (5.53)	0.278
9 <sup>th</sup> Grade	57.38-99.64		91.12 (7.74)	0.190
10 <sup>th</sup> Grade	27.33-100.00		82.22 (16.62)	0.286
Suspensions				
8 <sup>th</sup> Grade	0-2		0.06 (0.36)	0.028
9 <sup>th</sup> Grade	0-2		0.04 (0.27)	0.139
10 <sup>th</sup> Grade	0-3		0.13 (0.45)	0.093
<i><u>Exposure Variables</u></i>				
Cross-Domain Exposure 8 <sup>th</sup> grade	0-0.67		0.61 (0.36)	
Domain specific exposure 8 <sup>th</sup> grade				
Truancy	0-0.67		0.06 (0.05)	
Suspension	0-0.67		0.05 (0.05)	
<i><u>Moderators</u></i>				
Quality of Mentor Relationship	2.00-4.00		3.47 (0.64)	0.409
Group Climate	1.40-4.00		3.22 (0.68)	0.093
<i><u>Covariates</u></i>				
Sex, <i>N (%)</i>				
Female		61 (53.5)		
Male		53 (46.5)		
Black, <i>N (%)</i>				
		20 (17.5)		
Hispanic, <i>N (%)</i>				
		64 (56.1)		
Special Education, <i>N (%)</i>				
		25 (21.9)		

**Table 14. Correlations among all Study 2 Variables**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Black	1													
2. Hispanic	-0.5	1												
3. SPED	0.15	0.11	1											
4. Sex	0.07	0.11	0.06	1										
5. IT 8th grade	-0.11	-0.08	-0.22	-0.17	1									
6. IT 9th grade	-0.04	0.02	-0.14	0.08	0.63	1								
7. IT 10th grade	-0.05	0.09	-0.15	0.11	0.5	0.66	1							
8. S 8th grade	-0.06	0.08	-0.09	-0.19	0.48	0.45	0.37	1						
9. S 9th grade	0.02	-0.1	-0.31	-0.14	0.76	0.53	0.41	0.58	1					
10. S 10th grade	-0.05	0.15	0.05	-0.08	0.09	0.24	0.2	0.69	0.05	1				
11. CDE	-0.16	0.13	-0.09	-0.09	0.22	0.16	0.14	0.25	0.24	0.16	1			
12. DSE, truancy	-0.22	0.12	0.05	-0.08	0.12	0.11	0.06	0.21	0.12	0.18	0.73	1		
13. DSE, S	0.14	-0.18	-0.03	-0.01	0.02	-0.17	-0.13	-0.57	0	-0.79	-0.16	-0.19	1	
14. Group climate	0.12	-0.13	0.31	-0.01	-0.1	-0.05	-0.07	-0.13	-0.09	0	-0.12	0.01	0.03	1
15. QMR	0.02	-0.06	0.15	-0.11	-0.08	-0.18	-0.13	0.01	-0.02	0.06	0.08	0.07	-0.07	0.58

*Note:*  $N = 114$ ; S = Suspensions; IT = Instructional time; CDE = Cross-domain exposure; DSE = Domain specific exposure; QMR = Quality of Mentor Relationship; correlations larger than 0.184 are significant at  $p = 0.05$  and correlations larger than 0.24 are significant at  $p = 0.01$

**Table 15. Results of multiple regression of 9th grade suspensions on domain specific exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 1-2)**

Model	1				2			
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR
DSE	4.623 (3.826)	[-1.67, 10.92]	0.20	1.22	6.112 (5.032)	[-2.17, 14.39]	0.22	1.25
Susp 8 <sup>th</sup> grade	0.658 (0.993)	[-0.98, 2.29]	0.09	1.09	0.052 (1.819)	[-2.94, 3.04]	0.01	1.01
Sex	1.127 (0.906)	[-0.36, 2.62]	0.20	1.22	0.902 (1.024)	[-0.78, 2.59]	0.14	1.15
Black	-1.984 (1.083)	[-3.77, -0.20]	-0.27	0.76	-2.352 (1.081) *	[-4.13, -0.57]	-0.28	0.76
Hispanic	-3.334 (1.288)*	[-5.45, -1.22]	-0.60	0.55	-3.688 (1.441)*	[-6.06, -1.32]	-0.57	0.57
Special Education	3.498 (1.424)*	[1.16, 5.84]	0.52	1.68	4.121 (1.648)*	[1.41, 6.83]	0.52	1.68
QMR	-0.289 (1.378)	[-2.56, 1.98]	-0.07	0.93	—	—	—	—
Exposure X QMR	-5.488 (7.593)	[-17.98, -5.49]	-0.16	0.85	—	—	—	—
GC	—	—	—	—	-1.107 (1.832)	[-4.12, 1.91]	-0.23	0.79
Exposure X GC	—	—	—	—	-8.531 (10.942)	[-26.53, 9.47]	-0.23	0.79

*Note for all subsequent Study 2 tables:* DSE = Domain specific exposure; CDE = Cross-domain exposure; QMR= Quality Mentor Relationship; GC= Group Climate; \* $p < .05$ , \*\* $p < .001$

**Table 16. Results of multiple regression of 9th grade suspensions on cross-domain exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 3-4)**

Model	3				4			
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR
CDE	0.137 (0.290)	[-0.34, 0.62]	0.06	1.06	0.268 (0.397)	[-0.39, 0.92]	0.10	1.11
Susp in 8 <sup>th</sup> grade	0.768 (0.940)	[-0.78, 2.32]	0.11	1.12	0.345 (1.449)	[-2.04, 2.73]	0.04	1.04
Sex	1.315 (0.878)	[-0.13, 2.76]	0.24	1.27	1.225 (0.940)	[-0.32, 2.77]	0.20	1.22
Black	-1.910 (1.070)	[-3.67, -0.15]	-0.27	0.76	-2.231 (0.992)*	[-3.86, -0.60]	-	0.76
Hispanic	-3.388 (1.240)*	[-5.43, -1.35]	-0.62	0.54	-3.701 (1.357)*	[-5.93, -1.47]	-	0.55
Special Education	3.445 (1.317)*	[1.28, 5.61]	0.52	1.68	3.947 (1.438)*	[1.58, 6.31]	0.60	1.70
QMR	-0.326 (1.072)	[-2.09, 1.44]	-0.08	0.92	—	—	—	—
Exposure X QMR	-0.232 (0.499)	[-1.05, 0.59]	-0.07	0.93	—	—	—	—
GC	—	—	—	—	-1.104 (1.292)	[-3.23, 1.02]	-	0.79
Exposure X GC	—	—	—	—	-0.394 (0.795)	[-1.70, 0.91]	-	0.89
							0.24	0.12





**Table 18. Results of multiple regression of 10th grade suspensions on cross-domain exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 7-8)**

Model	7				8			
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	OR
CDE	-0.041 (0.316)	[-0.56, 0.48]	-0.01	0.99	0.001 (0.312)	[-0.51, 0.51]	0.01	1.01
Susp in 8 <sup>th</sup> grade	-1.743 (3.867)	[-8.10, 4.62]	-0.26	0.77	-1.671 (3.402)	[-7.27, 3.93]	-0.26	0.77
Sex	-0.102 (0.651)	[-1.17, 0.97]	-0.02	0.98	-0.147 (0.645)	[-1.21, 0.91]	-0.03	0.97
Black	-0.380 (0.963)	[-1.97, 1.20]	-0.07	0.93	-0.206 (0.933)	[-1.74, 1.33]	-0.04	0.96
Hispanic	-0.497 (0.615)	[-1.51, 0.51]	-0.12	0.89	-0.452 (0.613)	[-1.46, 0.56]	-0.11	0.90
Special Education	0.530 (0.734)	[-0.68, 1.74]	0.11	1.12	0.503 (0.730)	[-0.70, 1.70]	0.10	1.11
QMR	-0.180 (0.597)	[-1.16, 0.80]	-0.06	0.94	—	—	—	—
Exposure X QMR	-0.268 (0.471)	[-1.04, 0.51]	-0.11	0.90	—	—	—	—
GC	—	—	—	—	0.040 (0.730)	[-1.16, 1.24]	0.00	1.00
Exposure X GC	—	—	—	—	-0.217 (0.588)	[-1.18, 0.75]	-0.08	0.92

**Table 19. Results of multiple regression of 9th grade instructional time on domain specific exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 9-10)**

Model	9			10		
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$
DSE	1.339 (7.107)**	[-10.35, 13.03]	0.02	1.148 (7.908)**	[-11.86, 14.16]	0.02
Inst time in 8 <sup>th</sup> grade	0.873 (0.133)	[0.65, 1.09]	0.67	0.875 (0.132)	[0.66, 1.09]	0.67
Sex	0.954 (1.798)	[-2.00, 3.91]	0.06	0.803 (1.753)	[-2.08, 3.69]	0.05
QMR	0.633 (1.364)	[-1.61, 2.88]	0.06	—	—	—
Exposure X QMR	4.856 (11.961)	[-14.82, 24.53]	0.05	—	—	—
GC	—	—	—	0.159 (1.438)	[-2.21, 2.52]	0.02
Exposure X GC	—	—	—	3.839 (12.186)	[-16.21, 23.89]	0.04

**Table 20. Results of multiple regression of 9th grade instructional time on cross-domain exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 11-12)**

Model	11			12		
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$
CDE	0.789 (0.664)**	[-0.30, 1.88]	0.11	0.855 (0.699)	[-0.30, 2.01]	0.12
Inst time in 8 <sup>th</sup> grade	0.867 (0.129)	[0.66, 1.08]	0.66	0.871 (0.128)**	[0.66, 1.08]	0.66
Sex	0.832 (1.661)	[-1.90, 3.56]	0.05	0.627 (1.620)	[-2.04, 3.29]	0.04
QMR	0.624 (1.267)	[-1.46, 2.71]	0.05	—	—	—
Exposure X QMR	0.067 (1.145)	[-1.82, 1.95]	0.00	—	—	—
GC	—	—	—	0.100 (1.391)	[-2.19, 2.39]	0.01
Exposure X GC	—	—	—	-0.360 (1.209)	[-2.35, 1.63]	-0.04

**Table 21. Results of multiple regression of 10th grade instructional time on domain specific exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 13-14)**

Model	13			14		
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$
DSE	19.781 (18.838)	[-11.21, 50.77]	0.12	180.080 (20.101)	[-14.99, 51.15]	0.11
Inst time in 8 <sup>th</sup> grade	1.328 (0.396)*	[0.68, 1.98]	0.49	1.308 (0.393)*	[0.66, 1.96]	0.49
Sex	0.830 (4.496)	[-6.57, 8.23]	0.03	0.678 (4.617)	[-6.92, 8.27]	0.02
QMR	1.517 (3.223)	[-3.79, 6.82]	0.06	—	—	—
Exposure X QMR	5.232 (24.900)	[-35.73, 46.19]	0.02	—	—	—
GC	—	—	—	1.515 (3.303)	[-3.92, 6.95]	0.06
Exposure X GC	—	—	—	7.232 (27.461)	[-37.94, 52.41]	0.03



**Table 22. Results of multiple regression of 10th grade instructional time on cross-domain exposure to peer behavior moderation by quality of mentor relationship and group climate (Models 15-16)**

Model	15			16		
	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$	Unstandardized estimate (SE)	90% C.I. [L.I., U.L.]	$\beta$
CDE	3.902 (1.434)*	[1.54, 6.26]	0.26	3.788 (1.499)*	[1.32, 6.25]	0.26
Inst time in 8 <sup>th</sup> grade	1.296 (0.417)*	[0.611, 1.98]	0.47	1.278 (0.415)*	[0.60, 1.96]	0.46
Sex	0.880 (4.090)	[-5.85, 7.61]	0.03	0.799 (4.377)	[-6.40, 8.00]	0.02
QMR	1.531 (3.304)	[-3.90, 6.97]	0.06	—	—	—
Exposure X QMR	0.708 (2.443)	[-3.31, 4.73]	0.04	—	—	—
GC	—	—	—	1.500 (3.228)	[-3.81, 6.81]	0.06
Exposure X GC	—	—	—	0.624 (2.781)	[-3.95, 5.20]	0.03

## 4 DISCUSSION

Research has documented peer contagion, or negative peer influence resulting in iatrogenic effects of group intervention, in the contexts of classroom settings, group psychotherapy and juvenile justice centers (Dodge et al., 2007). However, research is limited as to whether these effects are found in group mentoring programs (Kuperminc & Thomason, 2013). Only a few studies have documented negative effects of participation in group mentoring programs (Dowd, Chen, et al., 2015; Dowd, Harden, et al., 2015; Kuperminc & Thomason, 2013) and a recent review of group mentoring literature found no evidence of peer contagion (Kuperminc, 2016). Still, the National Mentor Partnership's implementation recommendations caution practitioners against including a high proportion of youth who exhibit problem behaviors in a mentor group (Garringer et al., 2015). The goal of this study was to use similar methods used to evaluate peer contagion in other youth contexts to examine whether such effects influenced mentee truancy and suspensions in one group mentoring program. This study also explored group climate and mentor relationship as potential protective factors that are unique to mentor groups and might moderate such peer contagion effects.

A first step in assessing for evidence of peer contagion was to document whether group members showed similar patterns in the behaviors of interest. Results showed that the ICCs decreased from baseline in 8<sup>th</sup> grade to 9<sup>th</sup> and 10<sup>th</sup> grades for instructional time (from 0.270 to 0.170 and 0.168) and suspensions (from 0.126 to 0.028 and 0.029). Thus, the amount of variance in both outcomes explained by clustering in mentor groups decreased across the years that the youth participated in the program, which suggests that there were no significant group-level effects of program participation on either instructional time or suspensions. Consistent with the null group-level findings and the recent literature review cited above (Kuperminc, 2016), Study 1

found no statistically significant effects of exposure to peers with a history of truancy or suspensions on mentees' instructional time or suspensions. Though it is still possible that peer contagion effects were not detected due to limited power in the given sample, the effect size of exposure suggests that if such peer contagion effects existed, they would be quite small.

This study measured peer contagion two ways, by looking at exposure to each outcome separately (domain specific) and by assessing exposure to either outcome together (cross-domain). Since these behaviors had not been studied in this context before, there was no precedent about the best way to measure peer contagion for group mentees. Neither method detected any peer contagion, therefore it is not possible to determine which measure was more sensitive to conveying risk for this population.

Study 2 assessed whether having a positive group climate and high-quality relationship with the mentor would protect mentees from negative effects of exposure to peers with a history of problem behavior. Neither moderator was found to be statistically significant, suggesting that there were no peer contagion effects across any group, which did not differ depending on the mentee's ratings of the quality of their relationship with their mentor or their group climate. However, the sample for Study 2 only included the mentees who completed a survey, which resulted in a smaller sample compared to Study 1 (which included all participants); therefore, it is possible that effects were not detected due to lack of power. Comparisons of samples from Study 1 and 2 shows that Study 2 underrepresented students with more unexcused absences in the 8<sup>th</sup> grade. For that reason, it is especially important to replicate these models in a larger sample that is representative of those who participated in the program. It is possible that the posited moderators had a significant protective effect for the participants with a history of more truancy in the 8<sup>th</sup> grade, which was not detected in this study due to sample bias. A quasi-



experimental evaluation of the PA program highlighted the prosocial value of these group processes, finding that participants with more positive relationships with mentors demonstrated increases in external resilience assets (e.g. school support and caring relationships with peers) and improved academic performance and participants who reported more positive group climate demonstrated increases in internal resilience assets (e.g. self-efficacy, self-awareness) (Kuperminc, Chan, & Hale, 2018).

This study found no evidence of negative peer influence on suspensions or truancy, still replications of these findings using these and other outcomes traditionally considered in peer contagion studies (e.g., aggression, substance use, criminal behavior) is needed. In the average PA mentor group, participants belonged to groups where about a quarter of participants had a history of truancy or suspensions in the 8<sup>th</sup> grade. Mentee's exposure varied by group, from exposure to no peers with a history of either behavior to exposure to 67% of group members with a history of truancy or suspensions. It is possible that peer contagion might occur in groups with a higher concentration of youth with a history of problem behavior (e.g. >67%).

Given the lack of research documenting peer contagion effects in group mentoring, it is possible that group mentor programs are successful in creating the conditions that enabled group members to be resilient to such negative peer influence processes. Theory suggests that peer social processes constitute the mechanism of positive programming outcomes (Kuperminc & Thomason, 2013). Group mentoring programs develop strong mentor-mentee relationships as well as peer relationships to intentionally cultivate a climate in which positive peer influence is leveraged to support participants, which may also make youth participants less vulnerable to deleterious peer influence processes. However, little is known about what components of effective programs mitigate peer contagion effects (Dodge et al., 2007), thus future research

should consider whether characteristics of group mentor programs might moderate negative peer influence processes, including further examination of the moderators in this study (e.g., group climate, mentor relationship quality), across a range of different group types, for different populations and in different contexts. It is possible that the high level of experience across all adult mentors in the PA program protected mentees from negative peer influence, however this effect was not directly assessed in this study.

It was important to consider truancy and suspensions as outcomes in this study since 1) those behaviors were related to the criteria used to identify which youth were eligible for the program, 2) they are important to school administrators and are used to determine the success of schools, and 3) they are behaviors that may make youth more vulnerable to negative peer influence processes (e.g. truancy or suspensions leading to more unsupervised time). However, there were some limitations to using these measures. For example, the measure of suspensions does not account for the reason why the student was suspended, which is important because the lack of precision makes it difficult to interpret the manner of peer influence and impact on each participant's life. Also, though instructional time is calculated using unexcused absences, it is still possible that students missed school for some reason other than intentionally skipping school, which could compromise the validity of this measure as an assessment of problem behavior. Since PA programming took place in school, it is also possible that students who missed school also did not attend their mentor groups. This study did not control for "dosage" or mentee attendance at programming, therefore it is possible that mentees who skipped the most school did not attend enough mentor group sessions to convey negative peer influence.

This study used a multilevel approach, clustering mentees within mentor groups, but no Level 2 peer contagion effects could be modeled using this sample due to limited number of

mentor groups and limited number of mentees per group. The literature suggests that including over 50 groups would improve the ability to estimate Level 2 standard errors with less bias (Maas & Hox, 2004). For this reason, if possible, future research should collect data from a larger number of mentor groups to be able to test group-level effects.

This study assessed peer influence as a socialization effect (e.g. association with mentor group peers inspiring behavior change), however, there could be some selection effects taking place as well. For example, mentees may choose to make friends with only certain peers from the mentor group, whose influence may be particularly salient. It is recommended that future studies of peer contagion in group mentoring contexts assess for such selection effects possibly by coding observed social interactions between particular group members or asking mentees to self-report which peers they spend time with outside of programming (e.g. via survey) and conducting social network analysis. It is also important to note that, rather than random group assignment, for the sake of feasibility, mentees were largely grouped based on who had similar school schedules. The lack of random assignment is evinced by the substantial shared between-mentor group variance in instructional time and suspensions (ICC of 0.270 and 0.170 respectively) before youth even participated in the PA program.

Neither study found evidence of peer contagion effects on instructional time or suspensions of PA group mentoring participants. It is not possible to determine whether the lack of detected effects is by virtue of lack of power, however, the small size of exposure effects and the decreasing intraclass correlations for instructional time and suspensions throughout the program, suggests no sizable peer contagion effects. This finding is consistent with other studies that have found that group mentoring programs for youth who are high risk for delinquent behavior can have positive (rather than iatrogenic) effects on problem behavior, risk of future

arrests, and criminal convictions (Lynch et al., 2018; Seroczynski et al., 2016; Weiler et al., 2015). This study evaluated peer contagion processes in the PA program and results suggest that grouping youth with a history of poor attendance and suspensions does not inherently increase risk of truancy and suspensions.

Grouping participants based on particular risk factors is essential to the rationale of primary prevention programs to provide resources to those most in need. Using this model, PA programming has supported youth to develop resilience assets and promote positive academic outcomes (Chan, Kuperminc, Seitz, Wilson, & Khatib, 2018; Kuperminc, Chan, Hale, Joseph, & Delbasso, 2018). Group mentoring is an efficient way of delivering resources to more vulnerable youth and this type of programming has been documented to lead to a broad range of positive outcomes (Kuperminc, 2016). To further the mission of providing safe, evidence-based mentor programming to youth, it is critical to continue assessing for possible negative peer influence processes in group mentoring programs, and, to resist publication bias by publishing null and negative results of such studies so that practitioners can make educated implementation decisions.

## REFERENCES

- Abrams, D. E., & Hogg, M. A. (1990). *Social identity theory: Constructive and critical advances*: Springer-Verlag Publishing.
- Allen, J., & Antonishak, J. (2008). Understanding adolescent peer influences: Beyond the dark side. *Peer Influence Among Youth*. New York: Guilford Press. *Google Scholar*.
- Ang, R. P., & Hughes, J. N. (2002). Differential benefits of skills training with antisocial youth based on group composition: A meta-analytic investigation. *School Psychology Review*, 31(2), 164.
- Bandura, A., & Walters, R. H. (1977). Social learning theory.
- Bodner, T. E. (2008). What improves with increased missing data imputations? *Structural Equation Modeling*, 15(4), 651-675.
- Boxer, P., Guerra, N. G., Huesmann, L. R., & Morales, J. (2005). Proximal peer-level effects of a small-group selected prevention on aggression in elementary school children: An investigation of the peer contagion hypothesis. *Journal of abnormal child psychology*, 33(3), 325-338.
- Brechwald, W. A., & Prinstein, M. J. (2011). Beyond homophily: A decade of advances in understanding peer influence processes. *Journal of Research on Adolescence*, 21(1), 166-179.
- Brezina, T., Kuperminc, G., & Tekin, E. (2016). Future Selves, Motivational Capital, and Mentoring Toward College: Assessing the Impact of an Enhanced Mentoring Program for At-Risk Youth Washington, DC: Office of Juvenile Justice and Delinquency Prevention.

- Brown, B. B., Dolcini, M. M., & Leventhal, A. (1997). Transformations in peer relationships at adolescence: Implications for health-related behavior.
- Burleson, J. A., Kaminer, Y., & Dennis, M. L. (2006). Absence of iatrogenic or contagion effects in adolescent group therapy: Findings from the Cannabis Youth Treatment (CYT) Study. *The American Journal on Addictions, 15*(s1).
- Burlingame, G. M., McClendon, D. T., & Alonso, J. (2011). Cohesion in group therapy: Educational Publishing Foundation.
- Catalano, R. F., Oesterle, S., Fleming, C. B., & Hawkins, J. D. (2004). The importance of bonding to school for healthy development: Findings from the Social Development Research Group. *Journal of School Health, 74*(7), 252-261.
- Chan, W. Y., Kuperminc, G., Seitz, S., Wilson, C., & Khatib, N. (2018). School-based group mentoring and academic outcomes in vulnerable high school students. *Manuscript submitted for publication.*
- Cohen, G. L., & Prinstein, M. J. (2006). Peer contagion of aggression and health risk behavior among adolescent males: An experimental investigation of effects on public conduct and private attitudes. *Child development, 77*(4), 967-983.
- Cox, R. B., Criss, M. M., Harrist, A. W., & Zapata-Roblyer, M. (2017). Are Negative Peer Influences Domain Specific? Examining the Influence of Peers and Parents on Externalizing and Drug Use Behaviors. *The Journal of Primary Prevention, 38*(5), 515-536.
- Deutsch, N., Henneberger, A., Wiggins, A., & Lawrence, E. (April, 2010). *Fostering connection: Mentoring groups as a context for relational development for adolescent girls and their mentors.* Paper presented at the Society for Research on Adolescence, Philadelphia, PA.

- Dishion, T. J. (2000). Cross-Setting Consistency in Early Adolescent Psychopathology: Deviant Friendships and Problem Behavior Sequelae. *Journal of personality, 68*(6), 1109-1126.
- Dishion, T. J. (2013). Stochastic Agent-Based Modeling of Influence and Selection in Adolescence: Current Status and Future Directions in Understanding the Dynamics of Peer Contagion. *Journal of Research on Adolescence, 23*(3), 596-603.
- Dishion, T. J., Dodge, K., & Lansford, J. E. (2006). Findings and recommendations: A blueprint to minimize deviant peer influence in youth interventions and programs. *Deviant peer influences in programs for youth: Problems and solutions, 366-394*.
- Dishion, T. J., & Dodge, K. A. (2005). Peer contagion in interventions for children and adolescents: Moving towards an understanding of the ecology and dynamics of change. *Journal of abnormal child psychology, 33*(3), 395-400.
- Dishion, T. J., Nelson, S. E., Winter, C. E., & Bullock, B. M. (2004). Adolescent friendship as a dynamic system: Entropy and deviance in the etiology and course of male antisocial behavior. *Journal of abnormal child psychology, 32*(6), 651-663.
- Dishion, T. J., Poulin, F., & Burraston, B. (2001). Peer Group Dynamics Associated with Iatrogenic Effect in Group Interventions with High-Risk Young Adolescents. *New directions for child and adolescent development, 2001*(91), 79-92.
- Dishion, T. J., Spracklen, K. M., Andrews, D. W., & Patterson, G. R. (1996). Deviancy training in male adolescent friendships. *Behavior therapy, 27*(3), 373-390.
- Dishion, T. J., & Tipsord, J. M. (2011). Peer contagion in child and adolescent social and emotional development. *Annual review of psychology, 62*, 189.

- Dodge, K. A., Dishion, T. J., & Lansford, J. E. (2006). Deviant Peer Influences in Intervention and Public Policy for Youth. Social Policy Report. Volume 20, Number 1. *Society for Research in Child Development*.
- Dodge, K. A., Dishion, T. J., & Lansford, J. E. (2007). *Deviant peer influences in programs for youth: Problems and solutions*: Guilford Press.
- Dowd, A. J., Chen, M. Y., Jung, M. E., & Beauchamp, M. R. (2015). "Go Girls!": psychological and behavioral outcomes associated with a group-based healthy lifestyle program for adolescent girls. *Translational behavioral medicine*, 5(1), 77-86.
- Dowd, A. J., Harden, S. M., & Beauchamp, M. R. (2015). Adolescent girls' experiences in the Go Girls! group-based lifestyle mentoring program. *American journal of health behavior*, 39(2), 267-276.
- DuBois, D. L., Portillo, N., Rhodes, J. E., Silverthorn, N., & Valentine, J. C. (2011). How effective are mentoring programs for youth? A systematic assessment of the evidence. *Psychological Science in the Public Interest*, 12(2), 57-91.
- Feldman, R. A. (1992). The St. Louis experiment: Effective treatment of antisocial youths in prosocial peer groups.
- Festinger, L. (1954). A theory of social comparison processes. *Human relations*, 7(2), 117-140.
- Garcia, A. J. (2007). *Investigating processes in a positive youth development program for multi-problem youth*. . Florida International University, Unpublished Dissertation.
- Garringer, M., Kupersmidt, J., Rhodes, J., Stelter, R., & , & Tai, T. (2015). *Elements of Effective Practice for Mentoring* (4th Edition ed.). Boston, MA: MENTOR: The National Mentoring Partnership.



- Gifford-Smith, M., Dodge, K. A., Dishion, T. J., & McCord, J. (2005). Peer influence in children and adolescents: Crossing the bridge from developmental to intervention science. *Journal of abnormal child psychology*, 33(3), 255-265.
- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention science*, 8(3), 206-213.
- Gregory, A., Skiba, R. J., & Noguera, P. A. (2010). The achievement gap and the discipline gap: Two sides of the same coin? *Educational Researcher*, 39(1), 59-68.
- Hanish, L. D., Martin, C. L., Fabes, R. A., Leonard, S., & Herzog, M. (2005). Exposure to externalizing peers in early childhood: Homophily and peer contagion processes. *Journal of abnormal child psychology*, 33(3), 267-281.
- Harter, S., Stocker, C., & Robinson, N. S. (1996). The perceived directionality of the link between approval and self-worth: The liabilities of a looking gladd self-orientation among young adolescents. *Journal of Research on Adolescence*.
- Hawkins, J. D., & Weis, J. G. (1985). The social development model: An integrated approach to delinquency prevention. *The Journal of Primary Prevention*, 6(2), 73-97.
- Hektner, J. M., Brennan, A. L., & August, G. J. (2017). Incorporating Well-Adjusted Peers in a Conduct Problems Prevention Program: Evaluation of Acceptability, Fidelity, and Safety of Implementation. *School Mental Health*, 9(1), 66-77.
- Henry, K. L. (2007). Who's skipping school: Characteristics of truants in 8th and 10th grade. *Journal of School Health*, 77(1), 29-35.

- Henry, K. L., & Huizinga, D. H. (2007). School-related Risk and Protective Factors Associated with Truancy among Urban Youth Placed at Risk. *The Journal of Primary Prevention*, 28(6), 505-519. doi: 10.1007/s10935-007-0115-7
- Henry, K. L., Knight, K. E., & Thornberry, T. P. (2012). School disengagement as a predictor of dropout, delinquency, and problem substance use during adolescence and early adulthood. *Journal of youth and adolescence*, 41(2), 156-166.
- Hergovich, A., Sirsch, U., & Felinger, M. (2002). Self-appraisals, actual appraisals and reflected appraisals of preadolescent children. *Social Behavior and Personality: an international journal*, 30(6), 603-611.
- House, L. D., Alvarez-Jimenez, A., McCoy, N., Lapidus, R. B., & Kuperminc, G. (2006). *Mentoring culturally diverse youth: Group mentoring processes and effects*. Paper presented at the Presentation at the 14th annual meeting of the Society for Prevention Research, San Antonio, TX.
- Huefner, J. C., Handwerk, M. L., Ringle, J. L., & Field, C. E. (2009). Conduct disordered youth in group care: An examination of negative peer influence. *Journal of Child and Family Studies*, 18(6), 719-730.
- Huefner, J. C., & Ringle, J. L. (2012). Examination of negative peer contagion in a residential care setting. *Journal of Child and Family Studies*, 21(5), 807-815.
- Iselin, A.-M. (2010). Research on School Suspension. *Center for Child and Family Policy, Duke University (NJI)*.
- Jekielek, S. M., Moore, K. A., Hair, E. C., & Scarupa, H. J. (2002). Mentoring: A promising strategy for youth development. *Child Trends Research Brief*, 2, 1-8.

- Joseph, H., Seitz, S., Wilson, C., Hale, K., Chan, W. Y., & Kuperminc, G. (2017). *Building Resilience in the High School Transition: Context Matters in Project Arrive Group Mentoring*. Paper presented at the Biennial Society for Community Research and Action Conference, Ottawa, Canada.
- Karcher, M. J., Kuperminc, G. P., Portwood, S. G., Sipe, C. L., & Taylor, A. S. (2006). Mentoring programs: A framework to inform program development, research, and evaluation. *Journal of Community Psychology, 34*(6), 709-725.
- Karcher, M. J., & Nakkula, M. J. (2011). *Play, Talk, Learn: Promising Practices in Youth Mentoring: New Directions for Youth Development, Number 126* (Vol. 116): John Wiley & Sons.
- Kuperminc, G. (2012). *Going for groups: A practical and theoretical case for group mentoring*. Paper presented at the 2012 Summer Institute on Youth Mentoring, Center for Interdisciplinary Mentoring Research, Portland State University.
- Kuperminc, G. (2016). Group Mentoring. *National Mentoring Resource Center Model Review*.
- Kuperminc, G., Chan, W. Y., & Hale, K. (2018). Group Mentoring for Resilience: Increasing positive development and reducing involvement in the juvenile justice system. Washington, DC: U.S. Department of Justice.
- Kuperminc, G., Chan, W. Y., Hale, K., Joseph, H., & Delbasso, C. (2018). The Role of School-based Group Mentoring in Promoting Resilience Among Vulnerable High School Students. *Manuscript submitted for publication*.
- Kuperminc, G., & Cummings, L. (2010). *Group mentoring for culturally diverse youth: The role of group process in promoting positive peer relations*. Paper presented at the Presentation at the biennial meeting of the Society of Research on Adolescence, Philadelphia, PA.

- Kuperminc, G., & Lesesne, C. (2009). Promoting Positive Youth Development to Prevent Teen Pregnancy and Sexual Risk Behaviors: The Role of Self-Determination and Social Capital in a Youth Development Program for African American Girls: Seed Grant Award for Social and Behavioral Science Research Collaborations Between GSU and CDC.
- Kuperminc, G., & Thomason, J. D. (2013). Group Mentoring. In D. L. DuBois & M. J. Karcher (Eds.), *Handbook of youth mentoring* (2 ed.): SAGE Publications.
- Lynch, M., Esthappan, S., N.M., A., & Collazos, J. (2018). Arches Transformative Mentoring Program: An Implementation and Impact Evaluation in New York City. Washington, DC: Urban Institute.
- Maas, C. J. M., & Hox, J. (2004). *Robustness Issues in Multilevel Regression Analysis* (Vol. 58).
- Mahoney, J. L., Stattin, H., & Magnusson, D. (2001). Youth recreation centre participation and criminal offending: A 20-year longitudinal study of Swedish boys. *International journal of behavioral development*, 25(6), 509-520.
- McKinney, S. (2013). Truancy: A Research Brief: Status Offense Reform Center,.
- Murphy, S., Soto, D., & Gopez, A. (1997). TeamWorks evaluation report: An investigation of program processes and outcomes. Claremont, CA: Claremont McKenna College Kravis Leadership Institute.
- Patterson, G. R., Dishion, T. J., & Yoerger, K. (2000). Adolescent growth in new forms of problem behavior: Macro-and micro-peer dynamics. *Prevention science*, 1(1), 3-13.
- Prinstein, M. J., & Dodge, K. A. (2008). Current issues in peer influence research. *Understanding peer influence in children and adolescents*, 3-13.
- Raffaele Mendez, L. M. (2003). Predictors of suspension and negative school outcomes: A longitudinal investigation. *New Directions for Student Leadership*, 2003(99), 17-33.

- Roberts, L. J., Salem, D., Rappaport, J., Toro, P. A., Luke, D. A., & Seidman, E. (1999). Giving and receiving help: Interpersonal transactions in mutual-help meetings and psychosocial adjustment of members. *American Journal of Community Psychology, 27*(6), 841-868.
- Rulison, K. L., Gest, S. D., & Loken, E. (2013). Dynamic social networks and physical aggression: The moderating role of gender and social status among peers. *Journal of Research on Adolescence, 23*(3), 437-449.
- Seroczynski, A., Evans, W. N., Jobst, A. D., Horvath, L., & Carozza, G. (2016). Reading for Life and Adolescent Re-Arrest: Evaluating a Unique Juvenile Diversion Program. *Journal of Policy Analysis and Management, 35*(3), 662-682.
- SFUSD. (2011). Student and Parent/Guardian Handbook, 2011-2012.
- Snyder, J., Schrepferman, L., Oeser, J., Patterson, G., Stoolmiller, M., Johnson, K., & Snyder, A. (2005). Deviancy training and association with deviant peers in young children: Occurrence and contribution to early-onset conduct problems. *Development and psychopathology, 17*(2), 397-413.
- Spear, L. P. (2000). Neurobehavioral changes in adolescence. *Current directions in psychological science, 9*(4), 111-114.
- Steinberg, L., Dahl, R., Keating, D., Kupfer, D. J., Masten, A. S., & Pine, D. S. (2006). The study of developmental psychopathology in adolescence: Integrating affective neuroscience with the study of context.
- Sutherland, E. H., Cressey, D. R., & Luckenbill, D. F. (1992). *Principles of criminology*: Rowman & Littlefield.

- Tolan, P., Henry, D., Schoeny, M., Bass, A., Lovegrove, P., & Nichols, E. (2013). Mentoring interventions to affect juvenile delinquency and associated problems: A systematic review. *Campbell Systematic Reviews*, 9(10).
- Veenstra, R., Dijkstra, J. K., Steglich, C., & Van Zalk, M. H. (2013). Network–behavior dynamics. *Journal of Research on Adolescence*, 23(3), 399-412.
- Warren, K., Schoppelrey, S., Moberg, D. P., & McDonald, M. (2005). A model of contagion through competition in the aggressive behaviors of elementary school students. *Journal of abnormal child psychology*, 33(3), 283-292.
- Weiler, L. M., Haddock, S. A., Zimmerman, T. S., Henry, K. L., Krafchick, J. L., & Youngblade, L. M. (2015). Time-limited, structured youth mentoring and adolescent problem behaviors. *Applied developmental science*, 19(4), 196-205.
- Weiss, B., Caron, A., Ball, S., Tapp, J., Johnson, M., & Weisz, J. R. (2005). Iatrogenic effects of group treatment for antisocial youths. *Journal of consulting and clinical psychology*, 73(6), 1036.
- Widaman, K. F. (2006). III. Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development*, 71(3), 42-64.
- Yalom, I. D. (1995). *The theory and practice of group psychotherapy*: Basic Books (AZ).