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Effects of Sex Composition on Group Processes in Alcohol Prevention Groups for Teens

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Abstract

Although most alcohol and other drug prevention programs for adolescents are offered in group settings, little is known about the possible effects of sex composition on group processes and mechanisms of change. Using the Group Actor-Partner Interdependence Model framework, we examined how the sex constellation of adolescent prevention group members influenced youth satisfaction, engagement, and endorsement of healthy behavior during group. Participants in Project Options ($N = 379$; 61.8% girls; $Mean = 16.1$; $SD = 1.4$), a voluntary school-based alcohol prevention program, completed measures of satisfaction at each prevention session and observers rated engagement and change talk for each group. When analyses were oriented towards girls, their personal satisfaction, group-rated satisfaction, and group-level engagement were positively related to having more girls in the group. Similarly, in boys, personal satisfaction, satisfaction of the group as a whole, and engagement in groups improved when groups were composed of more girls. Statements supportive of healthy alcohol/drug-related decision making were unrelated to group composition. The findings suggest that the composition of girls and boys in groups has differential effects on some group processes. This avenue of research has merit for the understanding the mechanisms associated with satisfaction and engagement in adolescent substance use prevention programs.

Keywords

sex; group process; alcohol prevention; adolescence

Recent epidemiological studies indicate that sex differences in cigarette smoking, binge drinking, and most illicit drug use are minimal early in adolescence and become more apparent by 12th grade, with boys generally reporting higher rates than girls (MTF, 2014). Similarly, despite higher rates of substance dependence in men than women among

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individuals over 18 years old, dependence rates are similar across sex among adolescents aged 12-17 (Substance Abuse and Mental Health Services Administration, 2014). These differing patterns of substance use and dependence underline the critical importance of understanding the dynamic role of sex differences among adolescents. The existing literature suggests that although youth share common risk and protective factors for substance use and abuse regardless of sex, the strength of these factors may vary between girls and boys. For example, protective family factors such as parental supervision, parental attitudes toward substance use, and parent/child attachment appear to be more protective for girls than boys (Fothergill & Ensminger, 2006; Kumpfer, Alvarado, & Whiteside, 2003). In addition, close friends' substance use attitudes seem to play a stronger role in predicting substance use for girls than boys (Mason, Mennis, Linker, Bares, Zaharakis, 2014). The current research focuses on sex as defined by the binary designation of sex assigned at birth (i.e., girl, boy).

More research is needed to explore etiological differences in the initiation, use, and maintenance of substance use between girls and boys (Amaro, Blake, Schwartz, & Flinchbaugh, 2001; Freshman & Leinwand, 2000). Further, current evidence for sex differences suggests that the development and implementation of prevention strategies for adolescents may benefit from incorporating sex-specific considerations. Although there have been significant developments in the application and investigation of effective prevention programs, research on sex differences in this arena is limited (Blake, Amaro, Schwartz, & Flinchbaugh, 2001; Kumpfer, Smith & Summerhays, 2008). More glaringly, the examination of sex-specific mechanisms of change in group settings (i.e., group processes and group behavior) has been understudied in the adolescent substance use prevention literature. Knowledge about sex influences on group process (e.g., satisfaction with intervention, level of engagement) is particularly important as most adolescent alcohol and drug prevention programs are provided in a group format (D'Amico et al., 2010a).

Although limited in the substance use treatment literature, there is a substantive body of work that highlights the differential impact of being a boy versus a girl in mixed-sex composition groups. In the literature on classroom behavior, girls traditionally receive less attention from teachers than their male peers, are more likely to help fellow students of either sex while being less likely to be asked for help from peers of either sex, and are more likely to focus on boys even when there are more girls than boys in the group (American Association of University Women, 1992; Sadker, Sadker, & Zittleman, 2009; Webb, 1984). Conversely, when groups are predominantly composed of boys, girls in these groups are more likely to be ignored (Webb, 1984). Group process research more generally has demonstrated that women conform to group norms more than men in peer influence situations (Eagly & Carli, 1981), and that women are more likely to be interrupted by men in mixed-sex group discussions (Smith-Lovin & Brody, 1989). Kimble, Yoshikawa, and Zehr (1981) found women in mixed-sex groups exhibit less participation in group discussions than women in homogeneous groups, a finding replicated in adolescents (e.g., Hoffman, Badgett, & Parker 2008).

Consistent with this broader literature, there is evidence that sex composition has a significant impact on group satisfaction and individual outcomes in adults seeking substance use treatment. For example, women report enhanced comfort and communication in same-

sex group therapy (Kauffman, Dore, & Nelson-Zlupko, 1995) and demonstrate greater satisfaction in women-only groups than mixed-sex groups (Greenfield, Trucco, McHugh, Lincoln, & Gallop, 2007). Similarly, women in mixed-sex treatment groups report feeling constrained, guarded, compelled to be polite, and rate their groups as having less empathy than women in same-sex groups where members felt that group communication was more honest, empathic, and open (Greenfield, Cummings, Kuper, Widgerson & Koro-Ljungberg, 2013). In addition, another study indicated that women were more likely than men in treatment for cocaine dependence to receive positive feedback from other group members (Johnson, Gibbons, & Crits-Christoph, 2011).

While boys and men may have an interpersonal advantage in some types group settings, as mentioned above, research on adolescent friendships suggests that cultural expectations may influence the nature of how boys and girls relate to each other in supportive social environments. Girls, when compared to boys, typically disclose and converse more, are more empathetic, and are more likely to both seek support and express their emotions (Rose & Rudolph, 2006). Although boys do want intimate and close relationships, masculinity norms (e.g., autonomy, competitiveness, emotional stoicism) and expectations surrounding self-disclosure (i.e., that self-disclosing about problems might make the boys feel uncomfortable; disclosing about problems would be a waste of time; disclosing would lead to ridicule; Oransky & Marecek, 2009; Rose et al., 2012) may inhibit boys from seeking emotional support, expressing feelings of hurt and vulnerability, or self-disclosing to others—especially other male peers (Oransky & Marecek, 2009; Way, 2012). Thus, boys might prefer being in groups that are mixed-sex in composition as these groups may afford boys opportunities to receive emotional support and may allow boys to disclose in ways and on topics that are often socially ridiculed (Leaper & Friedman 2007).

It appears that satisfaction and group process may be affected by the sex composition of the groups, both in classroom, treatment, and friendship settings. As verbal participation in group therapy is associated with greater chance of change and improvement (Fielding, 1983), this may have implications for the relative success of same-sex and mixed-sex prevention groups for girls and women. However, these effects have yet to be examined in prevention settings and are largely unstudied in adolescent samples. Adolescent alcohol and drug prevention programs are often offered in a group format, given affordability and developmental considerations (e.g., needs for peer affiliation; D'Amico et al., 2010a). Therefore, it is particularly important to understand how satisfaction, engagement, and other verbal indicators may differ on the basis of group composition for youth. To this end, the aim of the current study was to examine whether group behavior and satisfaction levels were influenced by the sex composition of groups in a voluntary school-based alcohol prevention program for youth.

One barrier to the growth of process-oriented group research is the analytic complexity associated with having multiple individuals, or actors, interacting within groups, while simultaneously dealing with issues of group homo- and heterogeneity. However, new analytic strategies have been developed that allow for modeling this complexity in relatively parsimonious ways. Measures of similarity between the actor and group are often limited to examination on a compositional dimension without accounting for data nesting and non-

independence in analyses (i.e., mutual influence; Kenny, Mannetti, Pierro, Livi, & Kashy, 2002; Williams & Meân, 2004). This is problematic as groups may be completely homogenous in terms of sex (i.e., all girls or all boys) and others may be heterogeneous (i.e., mixed-sex), rendering sex a mixed independent variable (i.e., not completely between groups nor is it entirely within groups; Kenny et al., 2002).

Recently, Kenny and Garcia (2012) described a strategy for furthering our understanding of how group composition affects individuals in groups, the Group Actor-Partner Interdependence Model (GAPIM). GAPIM estimates the effect of individuals (main effects) and other members of the group (interaction effects) on outcomes and provides a paradigm for examining hypotheses regarding group interaction patterns relative to group composition. This strategy allows for the *a priori* test of models relating to the relative influence of the actor (i.e., the individual), the group (i.e., other group members), and transactions between the two, elucidating important processes in group dynamics. Kenny and Garcia (2012) suggest a number of potential models including contrast models, or the *frog pond* effect, where benefits lie in having partners in group that are “not like me” and diversity models, such as the *person-fit* model, where benefits can be conferred by having fellow group members “like me.” Lo Coco, Gullo, Lo Verso, and Kivlighan (2013) adapted this framework to address issues of sex composition in a path analytic framework. This modeling strategy provides an advantage over others, as it allows the examination of aspects that vary from group to group (e.g., group size; site differences) and permits non-independence (e.g., the person's own sex is part of the group's sex composition).

Given the importance of the peer group during adolescence and the dearth of research regarding the potential effect that sex composition may have on group processes in adolescence, the aim of the current study was to examine whether sex composition influenced group process during adolescent alcohol and drug prevention groups utilizing Kenny and Garcia's (2012) GAPIM as a framework to examine the effect of sex at the group- and individual-level. Specifically, we analyzed the effect of sex composition on group process measured as: 1) individual satisfaction of group members, 2) group level satisfaction, and 3) group engagement/responsiveness. These group process variables have been linked with improved outcomes in previous group intervention research (Johnson et al., 2011). We expected group composition to differentially impact satisfaction and engagement of girls and boys in prevention groups. Based on Kenny and Garcia's (2012) framework, we expected girls to exhibit a person-fit model whereby satisfaction and engagement increase as group membership was “more like me” in terms of sex. In contrast, we expected boys to exhibit a frog pond effect, whereby boys' satisfaction and engagement would be better served in mixed-sex environments with fewer boys “like me.”

A secondary aim of the study was to explore the effect of sex composition on verbal behavior in groups specific to the alcohol prevention context (i.e., health promoting behavior in terms of substance use). We conducted exploratory analyses examining whether rates of verbal statements promoting healthy behavior varied based on group composition. Specifically, we examined whether there was an effect of sex on the construct of change talk, a hypothesized mechanism of change in motivational interviewing (MI) that has been linked to subsequent behavior change (Miller & Rollnick, 2002; Moyers, Martin, Houck,

Christopher, & Tonigan, 2009) adapted to a prevention setting (see Ladd, Tomlinson, Myers, & Anderson, 2015).

Method

Participants

Students ($N = 379$) in this investigation participated in Project Options, a prevention program for youth with and without alcohol or other drug experience, designed to address adolescent preferences and reduce barriers to participation (Brown et al., 2005; D'Amico et al., 2006). Ninth through 12th grade high school students from six schools located in Miami, FL, Minneapolis, MN, and Portland, OR participated in prevention groups (up to 12 youth/group). For this investigation, we focused on youth participating in the motivationally-enhanced (ME) group protocol between Spring 2013 and Fall 2014 where more than two students were in attendance (N groups = 222). The research protocol also includes an educational control condition not discussed here. Student demographics and baseline alcohol and other drug use characteristics are presented in Table 1. Overall, the sample of youth was fairly diverse in terms of race, ethnicity, and grade in school; approximately two-thirds of the participants were girls.

To determine if sex was unequally represented among other demographic variables, we explored relations between sex and race, $\chi^2(4, N = 379) = 1.49, ns$; sex and Hispanic/Latino status, $\chi^2(1, N = 372) = 1.54, ns$; and sex and grade in school (9th – 12th), $\chi^2(3, N = 377) = 5.53, ns$. Additionally, we compared the frequencies of race and grade, $\chi^2(12, N = 377) = 10.26, ns$; as well as Hispanic/Latino status and grade $\chi^2(3, N = 371) = 1.70, ns$. Using a series of t -tests (Bonferroni corrected p -value = .01), we determined that boys and girls in the sample did not differ on average alcohol use, $t(371) = -1.55, ns$, maximum alcohol drinks on drinking days, $t(367) = -2.11, ns$, number of binge days in previous 30 days, $t(368) = -1.63, ns$, or past 30 day alcohol use, $t(361) = -2.06, ns$. When comparing boys' and girls' marijuana use among individuals who used marijuana (i.e., marijuana users only) in the past 30 days, there was no significant difference between boys and girls, $t(71) = -1.27, ns$.

Procedure

Each site's corresponding institutional review boards, school districts, and individual high schools approved all study procedures. Students self-selected into the program, chose the number of sessions they wished to attend, and decided whether they wanted to participate in sessions continuously or throughout the academic year. Written consent from parents and youth assent was obtained for all participating students.

Project Options is a universal, school-based alcohol prevention program that is based on a cognitive social learning model of youth alcohol use self-change (de-escalation or cessation; Brown, 2001), or maintenance of healthy decision making about use, and takes into consideration key social, behavioral, and neurocognitive developmental processes for adolescents (Bekman et al., 2011, Chung et al., 2003; Gottlieb, Wahlsten, & Lickliter, 1998). Project Options combines ME and cognitive-behavioral techniques to address

perceptions and actual alcohol use norms, challenge alcohol expectancies, teach stress management, explore alternative activities that do not involve substance use, planning for abstention from substance use in use contexts, and evaluating the advantages and disadvantages of alcohol use, change, and maintenance (marijuana and other drug use is addressed to a lesser degree). These sessions were delivered using ME techniques in the active condition to facilitate self-change efforts and to support the maintenance of healthy choices relating to alcohol use. Interventionists discussed limits to confidentiality at the beginning of each session, and participants were encouraged not to disclose personal information shared by group members outside of group. Prevention sessions were offered onsite during the schools' lunch period. Participants completed self-report measures at their first session and a brief session rating at the end of every session. Youth received free lunch (e.g., pizza) during Project Options sessions and received \$5 gift cards of their choice after completing an initial assessment during their first session.

Two interventionists, not affiliated with the schools, facilitated the groups. Facilitators were trained in motivational interviewing techniques by Motivational Interviewing Network Trainers (MINT-certified), were also trained in the Project Options protocol developed for the first efficacy trial (Brown et al., 2005), and received supervision weekly by a licensed clinical psychologist at each site. In addition, all facilitators and intervention staff participated in biweekly multi-site conference calls for additional support and to ensure adherence to procedures across sites. During each session, trained coders observed and recorded specific in-session group processes and student behaviors (see below).

Measures

Background characteristics—Participants indicated their age, self-identified sex, grade (9th - 12th), Hispanic origin (yes or no), and race. Sex was contrast coded for analysis (1, -1); however, as analyses were anchored by sex (see analytic strategy below), the positive/negative valuation varied by target (i.e., models for girls, sex = 1 and boys = -1; flipped for boys' models).

Group composition—The proportion of girls and boys in groups were calculated for each session and was adjusted specifically for the sex under investigation in the models (i.e., removing the actor from the proportion in both the numerator and the denominator). For example, in the model anchored for girls (see below), girl actors were removed from the numerator and denominator, but boys were left in the numerator and denominator. The opposite strategy was implemented in models anchored for boys. The proportion of girls in group ranged from 0 - 1 (i.e., no girls in groups to all girls in groups; $M = 0.59$, $SD = 0.24$).

Group engagement and responsiveness—Two items assessed the groups' engagement and responsiveness in session ($\alpha = .89$). Coders rated the overall level of group engagement in discussion and the level of group's responsiveness to leaders' questions/comments on a 7-point scale ranging from "Not at all" to "Very Much." Using the sample of 62 groups that were double-coded, percent agreement among the raters indicated that 75% of ratings were within 1 point of each other and 90% were within 2 points of each other.

Healthy vs. Unhealthy Substance-Related Statements—The coding of healthy vs. unhealthy supportive statements were largely adapted from the CLEAR Coding System (Glynn & Moyers, 2012, <http://casaa.unm.edu/download/CLEAR.pdf>), developed to index change talk and counter-change talk in the MI treatment literature. Statements made by participants were coded at the utterance level (i.e., single unit of speech) for *healthy behavior*, or statements regarding the promotion of healthy or risk reduction behavior related to alcohol or other drug use, *unhealthy behavior*, or statements that rejected low risk or abstinence from alcohol or other drug use and statements that were pro-hazardous use, and neutral statements (i.e., statements that did not fall into either category above). Coding was done in session by trained independent observers, and the number of statements in each category was tallied. Percent healthy talk was calculated as healthy/(healthy+unhealthy) and has demonstrated acceptable levels of interrater reliability in Project Options (Ladd et al., 2015).

Session satisfaction—Participants rated their satisfaction with each Project Options session by evaluating whether (1) the discussion was helpful, (2) they could use the information, (3) liked this type/style of meeting, (4) interventionists were helpful, and (5) if the individual felt that he or she was part of the group on a 9-point scale ranging from “Not at all” to “Extremely” ($\alpha = .89$). Participants completed these questions after each session. In this strategy, the individual's, or actor's, satisfaction ratings are separated from the other group members' aggregated satisfaction ratings, resulting in two variables: individual satisfaction (actor) and group satisfaction (other).

Total number of sessions—The total number of sessions a student attended was included as a covariate in analyses as members of the group had varying rates of attendance sessions (Range 1 - 28; $M = 6.49$; $SD = 5.06$; Median = 6; Mode = 6).

Group size—Based on past research using this analytic strategy (Lo Coco et al., 2013), the total number of students in each session was included as a covariate and ranged from 3 - 11 ($M = 7.69$, $SD = 2.33$; Median = 9).

Analytic Plan

Similar to Lo Coco and colleagues (2013), we used a path analytic framework for our analyses. To account for the nesting of individuals within each session and the nonindependence of group members' ratings relative to the actor, the error terms for individual level satisfaction and group level satisfaction are correlated. The number of individuals in the session is included as a covariate to account for nonindependence bias relative to group size (i.e., more individuals = greater bias; Kenny et al., 2002). Given the structure of our prevention program, we estimated models for youth attending multiple group sessions with varying sets of student participants. This resulted in repeated measures from participants. To handle the correlated data within schools and multiple data points for participants, generalized structural equation modeling including random effects (repeated assessments within individual [level 3] nested within schools [level 2]) was implemented using Stata 13.0 (StataCorp, 2013).

Given our hypotheses regarding specific effects for girls and boys, we anchored analyses separately for each sex. As such, GAPIM modeling was conducted twice: once with the actor and group composition anchored for girls (i.e., group composition indicated by the proportion of girls in group relative to the actor's sex) and a second for boys (i.e., group composition indicated by the proportion of boys in group relative to the actor's sex). To examine the effect of sex and sex composition on individual and group level satisfaction, we regressed actor sex, the sex composition of the group, and the interaction of sex and composition (sex \times sex composition) onto individual-level and group-level satisfaction. We also examined the effects of sex, group composition, and the interaction of sex \times composition on group-level outcomes: group responsiveness/engagement and the percentage of healthy statement as rated by group observers. As the models were fully saturated, we compared Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) for our models versus a null model (i.e., all paths constrained at 0) to estimate model fit.

Results

Multivariate normality was evaluated using Mardia's test for multivariate normality and was statistically significant ($p < .001$), indicating non-normality. However, examination of univariate indices of skewness and kurtosis revealed no absolute values above 2 for skewness and 7 for kurtosis (Curran, West, & Finch, 1996). As these path models were fully saturated and fit indices could not be obtained, we first estimated a null model and compared it to the saturated model to get a relative index of fit, similar to Kenny and Garcia (2012).

When we examined group and individual satisfaction and analyses were anchored for girls, our model had improved AIC (17967.56) and BIC (18079.12) estimates over the null model (18449.84; 18508.27, respectively). In line with our hypotheses and with Kenny and Garcia's person-fit model, both girls' individual satisfaction ratings and group level ratings were significantly and positively related to having more girls in the group (i.e., the interaction) when analyses were anchored for girls ($B = 0.23$, $SE = 0.11$ and $B = 1.08$, $SE = 0.26$ respectively; Figure 1). Further, having more individuals overall in group led to a decrement in satisfaction ratings for both individuals and groups. The number of sessions attended also showed a significant and positive relationship with individual level satisfaction but was not significantly related to group level satisfaction. There was a significant random effect on the proportion of girls in group ($B = -0.11$, $SE = 0.02$, $p < .001$), indicating that variation associated with individuals nested within schools was significant and thus influenced the model's estimation. Given that R-squared cannot be estimated when using generalized SEM in Stata 13.0, we estimated the model without the random effects to obtain a rough estimate of R-squared (R^2 for individual satisfaction = .05; R^2 for group satisfaction = .05; overall $R^2 = .11$).

When comparing the null model to the saturated model for boys' satisfaction outcomes, AIC and BIC improved (null model AIC: 18641.41; BIC: 18699.85; boys' model AIC: 18158.33; BIC: 18269.89). For boys, what appears to matter is the diversity in group (i.e. from the boys' perspective, having more girls in group). Consistent with Kenny and Garcia's (2012) termed frog pond effect, when analyses were anchored on boys, boys' individual and group level satisfaction ratings improved when there were more girls (i.e., the interaction; B

= -0.23 , $SE = 0.11$ and $B = -1.07$, $SE = 0.26$, respectively; Figure 1). In line with the girls' results, as the number of individuals in session increased, individual and group levels of satisfaction decreased. The total number of sessions attended by students was positively related to individual levels of satisfaction; however, total number of sessions attended was not significantly related to group level satisfaction (Figure 1). In line with the previous model, there was a significant random effect (i.e., individuals nested in schools) for the proportion of boys in group ($B = -0.77$, $SE = 0.21$, $p < .001$). As in the previous model for girls, the R^2 was estimated without the random effects within the models (R^2 for individual satisfaction = .05; R^2 for group satisfaction = .05; overall $R^2 = .11$), to be expected as only actor anchoring changed between models.

For ratings of group engagement/responsiveness and the percentage of health promoting statements, the AIC improved over the null model, but not BIC, when the analyses were anchored on girls (AIC: 10506.55; BIC: 10618.11; AIC: 10545.24; BIC: 10603.68, respectively). Group engagement/responsiveness was also significantly and positively related to the sex \times proportion of girls in group ($B = 0.42$; $SE = 0.13$, $p < .01$), such that when the proportion of girls increased, engagement/responsiveness independently rated from outside observers was greater (Figure 2); however, sex \times proportion of girls in group was not significantly related to the percentage of healthy statements. The number of group members was not significantly related to group engagement/responsiveness, but was significantly related to healthy statements, such that as the number of participants in group increased, so did the ratio of health-supportive statements, when analyses were anchored on girls (Figure 2). The number of sessions attended by participants had an inverse relationship to group engagement/responsiveness, such that the more sessions an individual attended, the lower engagement/responsiveness of the group (Figure 2). However, the number of sessions attended had a positive and significant relationship with health promoting statements (Figure 2). As with the previous models, the random effects parameter was significantly related to proportion of girls in session ($B = -0.11$, $SE = 0.02$, $p < .001$), indicating a nested effect for repeated measurement within schools. Akin to the previous models, the R-squared was calculated without the nesting structure; one percent of the variance in engagement/responsiveness and two percent of the variance in positive health-related statements was accounted for by the predictors (overall R-squared = 3%).

Similar to girls, there was an improvement in the AIC, but not BIC, when examining the prediction of group engagement/responsiveness and healthy statements in our model for boys as compared to the null model (AIC: 10698.75; BIC: 10810.31; AIC: 10736.82; BIC: 10795.25, respectively). Group engagement/responsiveness was significantly and negatively related to the interaction of proportion of boys in group and sex ($B = -0.44$; $SE = 0.13$, $p < .01$), such that the greater proportion of girls in group, the more likely boys were rated as engaged/responsive in these analyses. However, the interaction of proportion of boys in group and sex was not significantly related to healthy statements. Additionally, the number of sessions attended was inversely related to engagement/responsiveness, but was positively related to healthy statements (Figure 2). The number of group members present did not have a significant effect on engagement/responsiveness, but was positively related to healthy statements. In line with previous models, there was a significant effect of nesting

participants within school ($B = -0.77$, $SE = 0.21$, $p < .001$). To get an estimate of the explanatory power of the model, the nesting structure was trimmed from the analysis as above and engagement/responsiveness had an R-squared of .01, while the prediction of positive health-related statements had an R-squared of .02 (overall R-squared = .03).

Discussion

Although there have been great strides in the application of prevention science, our understanding of sex differences and sex-specific group processes remains limited. To this end, the purpose of this investigation was to determine whether youth satisfaction within a voluntary, motivationally-based prevention program differed as a function of the proportion of “like me” or “not like me” peers in group as defined by sex. Similar to previous group process research (Lo Coco et al., 2013), we found that sex composition of groups differentially predicted process-oriented outcomes. Although tentative, our findings indicate that both girls’ and boys’ individual and group satisfaction, as well as engagement, increased as the proportion of girls in group increased (in line with the person-fit model for girls and frog pond for boys). Conversely, when examining healthy statements by the group, the percentage of health promoting statements was determined by how many youth were in session and how many sessions each individual had attended for both boys and girls; as such, sex composition was not related to this group process. Thus, the sex of the individual and the sex of the composition in group may interact to affect satisfaction and engagement with the group, but does not necessarily impact in-session promotion of healthy behavior.

Differential patterns of social interaction and affiliation between boys and girls may have influenced the preference for girls to be with other girls in prevention groups and boys interest in more mixed-sex groups. Similar to women in Greenfield, Trucco, McHugh, Lincoln, and Gallop's (2007) qualitative work comparing women's only vs. mixed sex therapy groups and the broader group process literature, girls in this sample may have found the prevention groups to be more cohesive, supportive, or empathic as the proportion of girls in groups increased. Alternatively, they may have been in groups with friends, likely other girls, leading to increased feelings of satisfaction. Pre-existing friendship, irrespective of sex, would likely influence these group processes as well. Unfortunately, our design did not include exit interviews to probe group process nor can we determine the number of friends or their sex for each individual within groups. Further, our findings for boys are particularly noteworthy. While it would be easy to generate heterocentric hypotheses as to why boys might prefer to be in groups with girls (e.g., boys are romantically interested in girls), we believe important group dynamics might also be at play. As research has demonstrated that both adolescent boys’ and adult men tend to use assertive communication, while girls and women use more affiliative speech (cf. Leaper & Ayres, 2007; Leaper & Smith, 2004), boys may feel social pressure to conform to sex-typed scripts in groups with greater proportions of boys (especially in unfamiliar settings or with unfamiliar people; Leaper & Ayres, 2007). Consistent with social-developmental research indicating that boys favor friends that are girls over boys when they have needs for support (Buhrke & Fuqua, 1987; Diamond & Dube, 2002; Leaper & Friedman, 2007), the increasing presence of girls in groups may afford opportunities for disclosure and support not commonly afforded to boys in our

culture. The use of qualitative research strategies would allow for more nuanced exploration of these issues than possible here.

Our findings regarding the number of individuals in session and satisfaction ratings were consistent with previous group process research. Lo Coco and colleagues' (2013) findings on group engagement and conflict suggested that individual and group satisfaction decreased as the number of people in group increased; however, in an eating disorder prevention program, Butryn, Rhode, Marti, and Stice (2014) found that group size was unrelated to outcomes (i.e., subsequent eating disorder symptoms). It may be that groups become less cohesive as group size increases, with cohesion acting as a mediator of outcome effects; an assertion unable to be tested here. In the current study's paradigm, shifting group membership at each session may also have influenced cohesion. Future work is needed to identify whether programs allowing rotating group membership show decrements in group cohesiveness and subsequent satisfaction in comparison to fixed membership groups.

Work on the effectiveness of group MI suggests that it is a promising approach to use with adolescents (D'Amico, Osilla, & Hunter, 2010). However, there is still substantial work needed to understand the processes underlying group MI with adolescents (e.g., healthy statements; engagement in group; satisfaction with group), the outcomes related to group MI with adolescents (both long and short term), and whether the delivery format matters in group MI with adolescents (D'Amico et al., 2010a). As an initial step, we assessed whether verbal statements towards healthy behavior in our motivationally-enhanced prevention program varied as a function of sex and group composition. We found that neither factor was related to the percentage of health promoting statements made in group. While this analysis was exploratory in nature, these preliminary findings suggest that even though sex may affect satisfaction (a variable linked to outcome; Johnson et al., 2011), composition does not impact within-session behavior in terms of promoting/rejecting healthy behavior. Although tentative, our findings suggest that self-identified sex may be an important factor in engagement and/or retention, but not necessarily in-session verbal behavior. This is important to consider given concerns of deviancy training in group treatments (Dishion, McCord, Poulin, 1999) and boys' higher rates of use in daily alcohol use, heavy episodic alcohol use, drunkenness, annual and daily use of marijuana, most illicit drugs, (except amphetamine) by the 12th grade (MTF, 2014). However, given the very small effect size found for group engagement/responsiveness and health promoting statements, any assertions in this arena must be made with extreme caution.

A strength of the present work is that Project Options provides a rich data source for examining group-based processes in alcohol prevention programming for adolescents. The relatively large sample of individuals participating in groups with rotating group entry better captures how prevention occurs in schools, rather than laboratory-based methods or contrived group models used in group dynamics research (cf. Williams & Meân, 2004). We were able to include students from diverse racial, ethnic, geographic backgrounds, and substance use characteristics within heterogeneous groups of youth. Based on previous work on sex-related processes in groups (Lo Coco et al., 2013; Kenny & Garcia, 2012; Williams & Meân, 2004), we used a sophisticated analytic strategy to account for group process relating to sex composition with a focus on process for both girls and boys.

However, these strengths are tempered by the limitations inherent to effectiveness research. While in vivo, live coding aids in the examination of group process in real time, it does also provide several limitations. Given the time constraints inherent in coding live and in session, our measures of engagement and responsiveness are limited to single item indicators. The use of single item indicators may have decreased the reliability in estimating group responsiveness and engagement, increased the possibility of measurement error, and may have hampered sensitivity. However, our use of both single item indicators and subsequent aggregation of the two items is in line with recommendations to improve stability and estimation (Rushton, Brainerd, & Pressley, 1983). Specific to findings related to in-session behavior, as Project Options is a universal and not indicated prevention program (i.e., focused on a high-risk population), it may be that the proportion of healthy versus healthy + unhealthy statements was relatively conservative as might be found in other settings. As most sessions included both nonusers and users, it could be that there was less variability in statements made in session. For example, if most of the group were nonusers, stigmatizing effects of endorsing unhealthy use, as a group norm, might have suppressed unhealthy use statements from heavier users. As such, the current findings may not generalize to targeted prevention contexts. In addition, we were unable to extend our findings from satisfaction, engagement, and health promoting statements to substance use outcomes at this time; an insufficient number of participants had complete follow up data to explore group-level outcomes relating to use. This is a limitation of our analytic strategy; as we focused on group processes, extrapolating individual outcomes from group processes with shifting membership is analytically challenging. Therefore, it is an open question whether sex constellation of prevention groups directly relates to substance use outcome in these contexts. An additional limitation that is of note is the models accounted for relatively small proportions of variance in the outcomes; however, this is not unexpected. As group process is a dynamic process situated within each group, satisfaction and engagement can be mutually affected by many factors that were beyond the scope of the current paper (e.g., cross-cutting categories; satisfaction and engagement by topic of session) given the complexity inherent in shifting group membership and the variability in sites (e.g., different facilitators across sites; differing school structures and regulations).

As research is just beginning to explore the probable etiological differences for alcohol and other drug use and maintenance for boys and girls, it is not surprising that the investigation of targeted and nuanced prevention strategies for girls and boys is limited (Kumpfer, Smith, & Summerhays, 2008). Given the current evidence regarding use rates for boys and girls, and sex differences in etiology, prevention strategies for adolescents may be strengthened by incorporating consideration of sex composition of the group in the delivery of group prevention. In fact, the mixed findings on effectiveness of prevention programs for girls suggest that there is insufficient evidence to conclude that prevention programs are effective for girls and boys equally (Guthrie & Flinchbaugh, 2001; Kumpfer et al., 2008). Further, the mechanisms that keep girls and boys in prevention programs (e.g., sex specificity in retention and group composition) are undetermined. This study is a first step toward addressing this gap in the literature by identifying and examining mechanisms (i.e., satisfaction with session; group constellation) that might promote retention for both boys and girls.

These findings have implications for the design and implementation of prevention programs for youth. As satisfaction and retention are related (Hser, Evans, Haung, & Anglin, 2004; Kelly, O'Grady, Brown, Mitchell, & Schwartz, 2010), providing opportunities to meet the needs of girls and boys in prevention programs relative to group constellation may have implications for outcomes. Our current findings point to several future lines of empirical inquiry that have yet to be examined in the literature. As the current study examined the sex composition of group as a proportion, perhaps one such next step is to examine if there is a “tipping point” for boys and girls regarding the composition of the group (e.g., examining a ratio of boys to girls that would improve satisfaction and engagement for both sexes) and satisfaction and engagement outcomes. Further, understanding aspects (e.g., satisfaction) that may increase the likelihood of engagement and retention in voluntary, school based prevention programs can improve the effectiveness and the delivery of these programs, which may in turn, subsequently improve our model of adolescent substance use prevention and cessation. Given that most prevention program formats are delivered in groups in school settings, understanding how participants view the prevention groups (made up primarily of their peers) that they engage in is an important step towards meeting adolescents’ needs. Future research also is needed to examine crosscutting categories in groups that may make individuals in group more or less “like me” (e.g., boys in groups who use more substances than girls who use less substances or vice versa) as past research on Project Options has found that satisfaction with session topic varied significantly based on substance use status (i.e., lifetime alcohol use, current alcohol use, abstainers; Kia-Keating, Brown, Schulte, & Monreal, 2008).

In sum, this study represents a first step in examining the effects of sex composition on group processes in school-based prevention groups. Further research examining how sex influences the processes and outcomes within youth alcohol and drug prevention frameworks is sorely needed. However, the framework applied here could also be extended to other individual difference factors that might impact group processes; work is underway to examine how ethnicity (Latino(a) vs. not) might impact group processes in our prevention work. Understanding how the constellation of prevention groups can influence youth satisfaction is an important factor to consider when developing and validating youth prevention programs given the predominance of group prevention programs administered to adolescents (D'Amico et al., 2010a).

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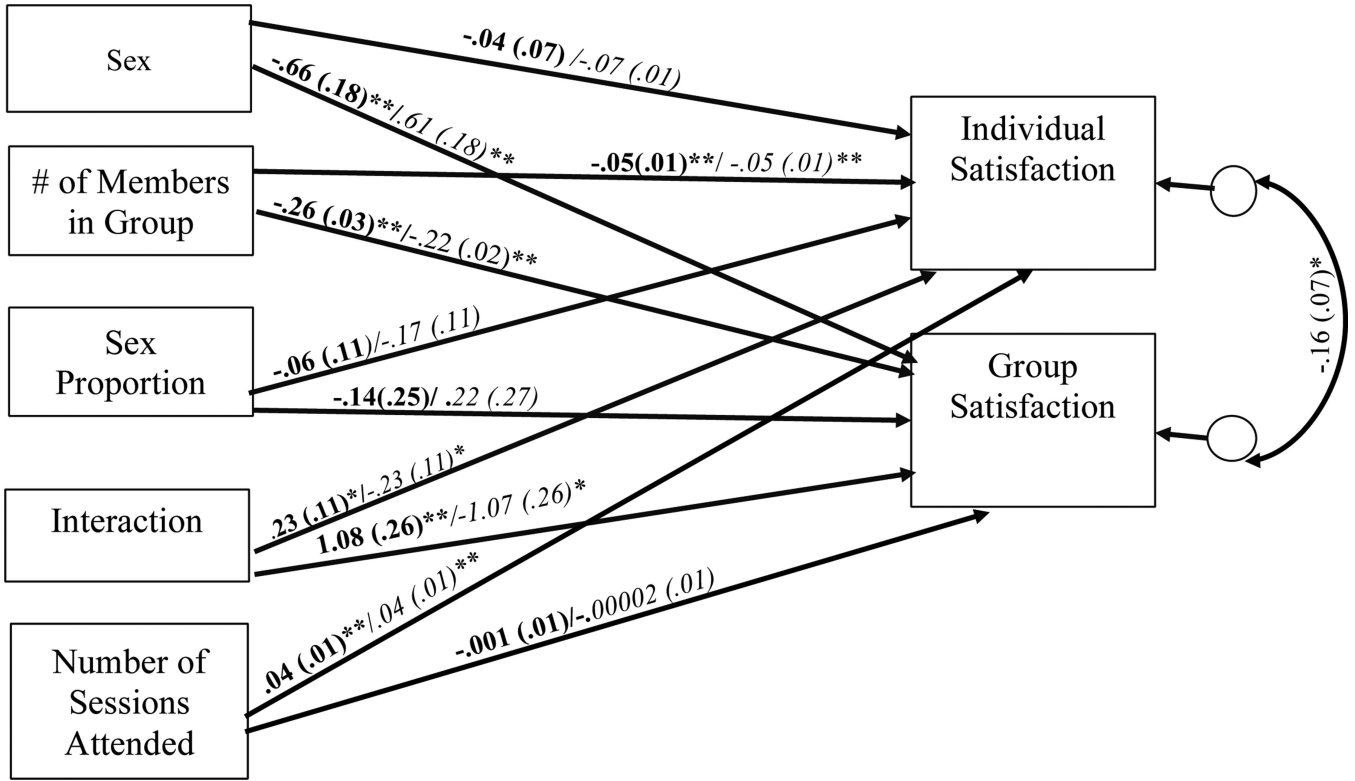


Figure 1. Path model for the estimation of individual and group level satisfaction by sex, group composition, their interaction, including covariates (number of members in group; total number of sessions attended). Multi-level random effects not pictured here. The results for girls are in bold and the boys' results are in italics. * $p < .05$; ** $p < .001$.

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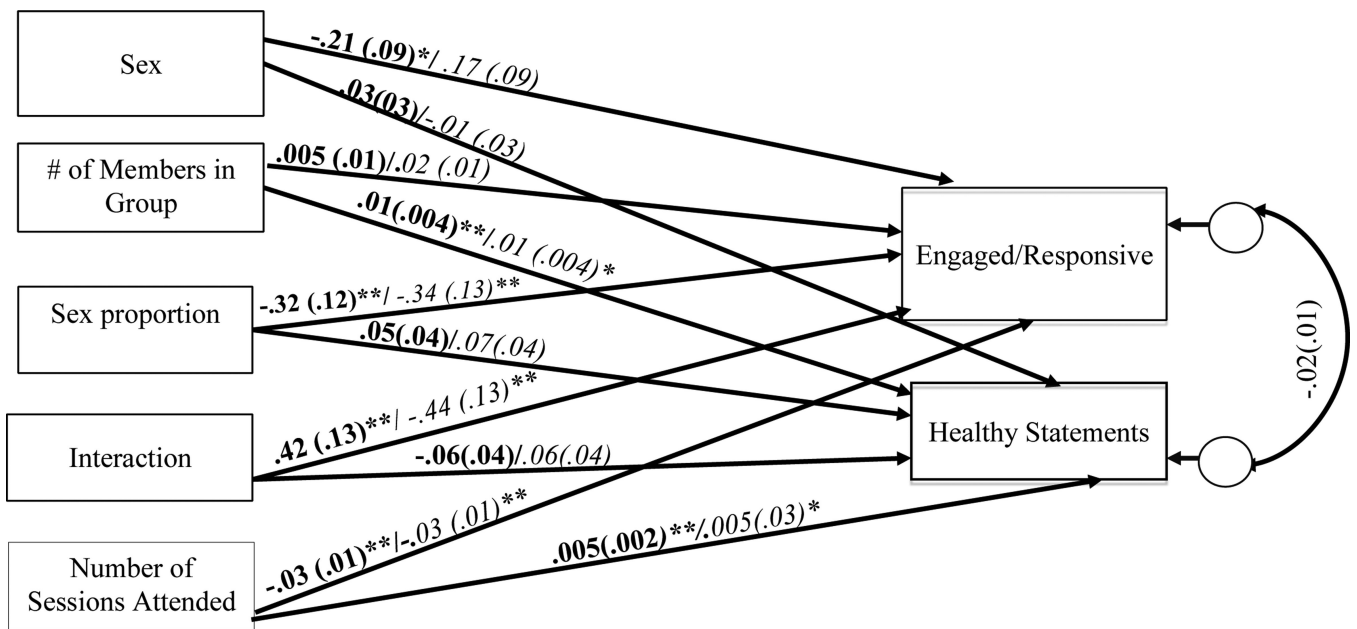


Figure 2. Path model for the estimation of engagement/responsiveness and percentage of health promoting statements by sex, group composition, their interaction, including covariates (number of members in group; total number of sessions attended). Multi-level random effects not pictured here. The results for girls are in bold and the boys' results are in italics. * $p < .05$; ** $p < .001$.

Table 1

Demographic and alcohol and other drug use characteristics of prevention sample (N = 379; 222 groups).

Individual Variable	M	SD	%	n
Age (years)	16.1	1.4		
Sex (girls)			62.8	238
Grade				
9 th			25.2	95
10 th			21.5	81
11 th			21.2	80
12 th			32.1	121
Race				
White			48.0	182
Asian			4.8	18
Black/African American			20.6	78
Mixed Race			6.6	25
Other			20.1	76
Ethnicity (% Latino/Hispanic)			41.9	156
Lifetime Alcohol User			59.6	221
Past 30 Day Drinking Days	1.1	2.9		
Lifetime Alcohol Problems *	1.7	3.3		
Lifetime Marijuana User			42.5	148
Past 30 Day Marijuana Use			19.3	73
Lifetime Marijuana Problems *	.63	1.7		

Note:

* represents frequency of problems experienced among lifetime users only.