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Peer pressure against prejudice: A high school field experiment examining social network change

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ABSTRACT

Individuals often conform to the intergroup attitudes and behaviors modeled by their peers in a given situation. To what extent does peer influence on intergroup prejudice 1) diffuse across a social network of peers and 2) affect attitudes and behavior across time? Student leaders ("Peer Trainers") were trained to confront expressions of intergroup prejudice in five randomly assigned high schools across a period of five months; students recruited to be Peer Trainers in five control schools waited to be trained. Independent surveys of Peer Trainers' social networks reveal that treatment Peer Trainers were significantly more likely than control Trainers to be nominated by peers as students who confront prejudice. Treatment Peer Trainers' tolerant behavior spread to close friends and to acquaintances in their social network; their attitudes spread inconsistently, and only to close friends. Studying peer influence within social networks can improve understanding of social influence, prejudice reduction, and social change.

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Introduction

Individuals often conform to the intergroup attitudes and behaviors modeled by their peers in a given situation. They express more tolerance of racist speech following a peer's expression of racist views, and less tolerance after a peer condemns racism (Blanchard, Crandall, Brigham, & Vaughn, 1994); they adjust to the current peer consensus on stereotyping when reporting their own racial stereotypes (Sechrist & Stangor, 2001; Stangor, Sechrist, & Jost, 2001); they are more tolerant of discrimination against minorities and women after overhearing racist or sexist jokes (Ford & Ferguson, 2004; LaFrance & Woodzicka, 1998) and when they perceive prejudice against those groups to be socially acceptable (Crandall, Eshleman, & O'Brien, 2002). A signal as subtle as a peer's antiracism t-shirt can go so far as to influence an individual's unconscious, uncensored prejudice (Lun, Sinclair, Glenn, & Whitchurch, 2007; Sinclair, Lowery, Hardin, & Colangelo, 2005).

Peer influence on intergroup prejudice is not driven by blind conformity, but by basic human goals of understanding, social connection, and self-definition (Asch, 1956; Cialdini & Goldstein, 2004). For example, Social Reality Theory shows that the goal of understanding and connection drives individuals to verify their experiences with others, and to express attitudes and behaviors that are recognized and valued by others (Hardin & Conley, 2000). Group Norms Theory and related work show that the goal of connection and

self-definition leads individuals to adopt the expressed attitudes and behavior of peers who represent valued group identities, as a means of socially connecting with the group (Crandall et al., 2002; Kelman, 1958; Sherif & Sherif, 1953) and of avoiding the label of social deviant (Blanton & Christie, 2003). These basic goals animate peer influence on many types of behavior, from environmental (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007) to political and economic (Nowak & Vallacher, 2001).

Because peer influence is driven by fundamental human goals, and because it can shift both prosocial and antisocial attitudes and behavior, it is important to understand the extent of its reach. In particular, to what extent does peer influence spread outside of the initiating influence situation, to ongoing expressions of attitude or behavior, and to other people? Previous work in this vein suggests that understanding the long-term diffusion of peer influence grants social psychologists a window into how behavioral patterns and social norms develop, and into how social climates or cultures evolve (Latané, 2000). Such work marks the study of peer influence as central to the broader study of social stasis and change.

With few exceptions, research on prejudice and intergroup relations does not examine the spread of peer influence outside of dyadic interactions. Laboratory experiments pinpoint the mechanisms of influence transmission for a single interaction with a racist or tolerant peer (e.g., Sinclair et al., 2005). Field experiments identify the real world effects of dyadic interaction, such as a peer's commentary about intergroup relations (Blanchard et al., 1994; Liebkind & McAlister, 1999), an ingroup vs. outgroup college roommate (Duncan, Boisjoly, Levy, Kremer, & Eccles, 2003; Shook & Fazio, 2008; van Laar, Levin, Sinclair, & Sidanius, 2005), and a discussion with a peer who

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espouses different intergroup beliefs (e.g., [Aboud & Doyle, 1996](#)). It is generally unknown to what extent these types of peer influence spread outside of the relationship to a social *network* of peers. By social network, I mean the regular patterns of relationship among individuals, patterns defined by friendship, kinship, work, common interest, or other bonds (see [Wasserman & Faust, 1994](#)).

This paper tests whether intergroup tolerance spreads across a social network of peers when individuals representing valued subgroups in the network model tolerance. Notwithstanding the recent flood of correlational studies that show social network influence to be strong and ubiquitous ([Christakis & Fowler, 2009](#)), theory and evidence from social psychology do not offer an *a priori* consensus on whether tolerance will spread through a network using the present strategy. Group Norms Theory ([Crandall & Eshleman, 2003](#); [Sherif & Sherif, 1953](#)) might predict that peers in the network would become more tolerant, because intergroup attitudes and behaviors are strongly influenced by representatives of psychologically valued “reference” groups (see [Smith & Louis, 2008](#), for a similar Social Identity Theory perspective). On the other hand, Deviance Regulation Theory ([Blanton & Christie, 2003](#)) notes that individuals often reject attitudes and behaviors of peer groups as a means of self-definition, and the Focus Theory of normative conduct demonstrates that peer influence is meaningful only when it is salient, which it may not be across various situations and time periods ([Kallgren, Reno, & Cialdini, 2000](#)). This range of perspectives demonstrates that examining the spread of tolerance throughout a network is an important theoretical as well as substantive question.

This paper also tests whether peer models are able to spread attitudes, behavior, or both. Evidence from dyadic social influence studies shows that both attitude and behavior can be influenced in the immediate situation. With respect to long-term and cross-situational change, different theories offer different predictions. For example, one classic take on social influence argues that behavioral compliance precedes attitudinal change ([Kelman, 1958](#)), while another argues that attitudinal change directs shifts in behavior ([Hovland, Janis, & Kelley, 1953](#)).

A wealth of research examines the psychological mechanisms of social influence. Mechanisms are of less interest for the present paper than the principal (and thus far unresolved) question of *whether* influence spreads throughout a network over time, and of what sort—attitudes, behaviors, or both. Our contribution is to demonstrate how measuring change in social networks could deepen our social psychological understanding of influence, prejudice reduction, and various types of social change.

Experimental context

I use a unique field experimental intervention to test whether peer influence can spread intergroup tolerance throughout a social network in the form of intergroup attitudes and behavior. The intervention aims to decrease intergroup prejudice and harassment among teenagers in U.S. high schools. Intergroup harassment, which includes teasing and other verbal abuse that is based on race, gender, religion, or appearance, is one of the most common forms of discrimination among adolescents ([Aboud & Joong, 2008](#); [Graham, Taylor, & Ho, 2009](#)). School-based interventions have focused on reducing the prevalence of biased teasing and verbal abuse because of the social and psychological harm inflicted on its targets and the consequent hostile school climate ([Derman-Sparks & Phillips, 1997](#); [Juvonen & Graham, 2001](#)).

Extensive research with adolescents illustrates the self-reinforcing dynamics of biased harassment among adolescents in schools (e.g., [Aboud & Joong, 2008](#); [Juvonen & Graham, 2001](#)). Students infrequently confront perpetrators or come to the aid of victims ([Hawkins, Pepler, & Craig, 2001](#); [O’Connell, Pepler, & Craig, 1999](#)), most likely because those who do attract the anger of their peers, and are liked

less ([Czopp, Monteith, & Mark, 2006](#); [Hawkins et al., 2001](#); [Shelton & Stewart, 2004](#); [Swim & Hyers, 1999](#)). Students’ inaction reinforces ideas regarding the acceptability of harassment and the unacceptability of standing up against it ([Juvonen & Graham, 2001](#)).

The current intervention used representatives of various subgroups throughout a high school to model anti-prejudice and anti-harassment behavior such as verbal condemnation of prejudice and confrontation of harassers. Previous work with adolescent social networks has examined the contagion of negative (aggressive and risk taking) behaviors ([Bearman & Moody, 1994](#); [Cohen & Prinstein, 2006](#); [Jaccard, Blanton, & Dodge, 2005](#)). This would be the first experiment to test whether a social network can be harnessed to spread prosocial behavior, specifically positive intergroup behavior.

Peer influence intervention

We¹ built the field experiment around the Anti-Defamation League’s (ADL) A World of Difference Institute Peer Training program, which starts from the premise that “the most important influence on the...attitudes and behaviors of young people is the attitudes and behaviors of one’s peers” (http://www.adl.org/awod_new). The program selects and trains a group of students in the participating school to be “Peer Trainers,” whose mandate is to model anti-prejudice attitudes and behaviors throughout the school. In particular, Peer Trainers are trained to intervene when they witness prejudiced behavior or speech among their classmates.

Peer Trainers are selected by ADL and school staff to reflect the population they will try to change: students involved in athletics, music, student government, math club, and in no organized activities at all. As such, Peer Trainers’ influence is theoretically well positioned to spread, since students throughout the school’s social network can identify with at least one Peer Trainer who represents a valued social group.

The ADL runs a weekly class for Peer Trainers that addresses the manifestations and effects of various intergroup prejudices like racial, gender, religious, and ethnic prejudice, and in particular the relatively common prejudices expressed by adolescents such as anti-fat and anti-gay prejudice ([Crandall, Merman, & Hebl, 2009](#); [Horn, 2007](#)). Classes also address systemic issues, such as structural discrimination and the democratic balance of free speech with protection of minority groups.

The other primary goal of the class is to help Peer Trainers acquire skills to intervene when classmates express some form of prejudice. The Peer Trainer instruction booklet describes intervention as “challeng[ing] the name-calling, put-downs, and insensitive remarks that are all-too-common occurrences in [school] halls.” Suggested actions include speaking directly to the perpetrator as the incident unfolds, speaking to the perpetrator after the incident, making your disapproval known to other students, calling an adult to intervene, and offering support to the target of prejudice following the incident. In class, Peer Trainers role-play scenarios in which they practice effective responses to prejudice and harassment.

Materials and method

[Fig. 1](#) illustrates the experimental design, a matched randomized waiting list study. Ten schools agreed to begin the Peer Training program in their school, in either the fall or the spring (the ADL identified these schools during their customary recruitment drive). We paired each school with its closest match in the sample, using a range of publically available data: number of students per teacher,

¹ I use “we” throughout the [Materials and method](#) and [Results](#) sections to indicate the indispensable collaboration of Bill Madden-Fuoco and other members of the Anti-Defamation League, Donald P. Green, and a team of undergraduate research assistants in the administration of the intervention and study.

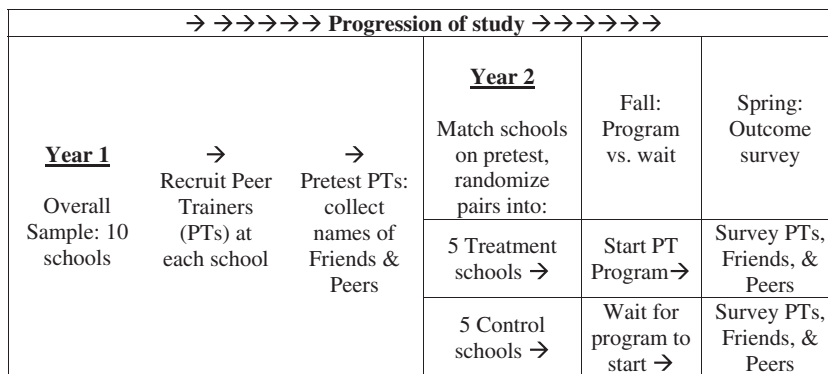


Fig. 1. Study procedure.

percentage of students receiving reduced lunch at the school, and the ethnic and racial composition of the school. Next, we randomly assigned one school in each pair to treatment (fall start of Peer Training program) and the other to control (spring start of program).

The advantage of the matched randomized design is that it provides a method for *ex ante* balance of observed differences between treatment and control conditions. Another advantage is its ability to avoid bias in instances of noncompliance: if one school does not follow the randomization procedure, that school's pair can be dropped from the study without biasing the overall sample (assuming noncompliance does not signal underlying differences that would have altered experimental outcomes). This happened in the study when one control school started the program too soon because of a miscommunication, forcing us to drop that school's pair.

Pretest

Students recruited to be Peer Trainers in each school understood that the program would start in either the fall or the spring. To ensure that the recruiting process was similar across schools, we did not inform schools when the program would start until we had collected pretest data from these prospective Peer Trainers. We took great care to keep Peer Trainers blind to the fact that the program was under study. Staff did not inform Peer Trainers of the evaluation, and they identified the pretest as a routine ADL questionnaire used at the beginning of the program.

The pretest served to compare the prospective Peer Trainers in each matched pair of schools, and to identify the social network to be interviewed at each school. We asked Peer Trainers about their motivation to join the program and whether they had participated in other clubs, organizations, or groups like the Peer Training program. There were no differences between Peer Trainers within each matched pair along these and related measures.

To build the rest of the social network sample, we asked prospective Peer Trainers to provide the names of two students they considered close friends and eight students they considered peers (described as "classmates, acquaintances you talk with in the hallway, people who are in your homeroom"). The exercise was explained as an opportunity for the ADL to know about other students who are in some ways similar to the Peer Trainers but who did not participate in the program. We used this sociometric information to build two subgroups for the study's outcome measurement: Peer Trainers' close friends (hereafter "Friends") and their classmates (hereafter "Peers").

Outcome measures

Outcome measurement occurred after the treatment schools had experienced five months of training and before the control schools started training. We mailed letters to the parents of Peer Trainers, Friends and Peers, which introduced the outcome survey as a

university-based telephone interview about adolescent viewpoints. The letter did not mention a connection with the Peer Training program or the ADL. Approximately one third of parents at each school sent back the attached permission slip; we called the remaining households in random order to obtain verbal permission.

Male and female researchers interviewed students on average twenty minutes; the survey measured awareness of and attitudes toward intergroup harassment, attitudes toward outgroups and toward political and systemic discrimination and prejudice, and self, peer-reported, and actual anti-prejudice behavior. The survey used validated items from other studies with adolescents; we sought items targeting relatively more socially acceptable prejudices among adolescents like anti-fat and anti-gay attitudes or behavior, to serve as the most challenging test of the peer influence intervention. We were unable to repeat survey items with a range of group targets, given the time constraints of a telephone interview.

The general expectation for all variables was that treatment Peer Trainers would be more likely than control Peer Trainers to exhibit awareness of prejudice and harassment and to publically stand up against it in their school. We then tested whether anti-prejudice and anti-harassment attitudes and behavior were more common among treatment Trainers and their Friends and Peers.

Awareness

To test whether the intervention raised students' awareness of prejudice and harassment in their school, we asked participants when they last overheard teasing or insults about another student's weight.

Attitudes

Continuing with the weight-biased teasing question described above, interviewers asked participants an open-ended question regarding whether they thought students *should* intervene if they overheard a person being teased or insulted about their weight. The interviewer also asked if intervening would be effective.

Three attitude items related to content from the Peer Training classes regarding structural issues of prejudice and discrimination. The first two tested ideas about prejudice and democratic principles: "I believe in free speech for everybody, no matter what his or her views might be" and, "Society shouldn't have to put up with people who have political ideas that are extremely different than the majority" (reverse coded). Addressing the class' emphasis on societal prejudice, we used the statement: "U.S. society prevents people of color from getting their fair share of the good things in life, such as better jobs and more money" (see Avery, Bird, Johnstone, Sullivan, & Thalhammer, 1992; Lopez, Gurin, & Nagda, 1998).

Finally, we included three attitude items validated in previous research with adolescents regarding social distance from stigmatized groups (Green & Wong, 2009): "If a person of a different religion were put in charge of me, I would not mind taking advice and direction from him or her"; "I would probably feel a little self-conscious dancing

with a person of another race in a public place”; and “I wouldn’t want to be around a teenager who was gay” (reverse coded). Participants responded to all attitude statements on a scale from 0 (disagree strongly) to 3 (agree strongly).

Behavior

First, we asked students to self-report their behavior. On a four point scale from very often to never, we asked participants how often they talked with their friends about the topics of discrimination, prejudice, and bias. Next we asked: “How comfortable do you feel talking with people about [these issues],” presenting a four point scale from extremely uncomfortable to extremely comfortable.

Second, we asked participants to report on the behavior of their peers. We asked participants to name which students out of the entire school population (including themselves) were likely to stand up for someone who was getting teased or verbally abused. We used the following prompt:

Imagine that you were in a situation at your school where one student was being teased or insulted—about anything, not just their weight. Among the people you know at your school, who do you think would be most likely to stand up for that student, maybe in front of the group, or maybe later on by confronting the person who was teasing him or her?

We asked students to give full names of up to four people. Each participant received a point if another participant nominated him or her, such that all participants received a nomination score from zero to $n - 1$, with n the total number of students interviewed at their school (self-nominations did not count toward the nomination score). We expected treatment Peer Trainers to be nominated the most frequently (more than control Trainers, and more than other students in treatment schools), since we they were the “trained experts” and most motivated to confront prejudice in the school. (Note that we did not request names for *all* students likely to intervene, but the names of students who were *most* likely to intervene, in which case we expect Peer Trainers to be nominated most frequently).

Third, to observe behavior directly we asked students whether they would post their full name on either, both, or neither of two student-created Internet petitions.² One petition called for fair and equal treatment of gays and lesbians in U.S. society. The second petition called for better treatment of the environment by U.S. companies. Posting one’s name to the gay rights petition represents a public defense of a stigmatized group, which was an important message of the Peer Training program. The environmental petition allowed students to behave in a socially desirable way while avoiding the request to stand up publically for a stigmatized group.

Interviewers explained that the petitions had been launched by student advocacy groups, and “as a favor to them, we’re asking the students we interview whether they’d like to have their full name posted on one or both of these petitions. Of course, you don’t have to have your name on either one if you’re not interested.” The order of presentation of the two websites was counterbalanced across interviews.

At the interview’s conclusion, interviewers gave a partial debriefing. To prevent information from spreading to students who had not yet been surveyed, we did not reveal that the survey was in fact connected to the Peer Training program. We told students that the website petition was hypothetical, and asked them to refrain from discussing the details of the survey with other students at school.

Data analysis

I fit the data with linear and ordered probit regressions, using robust standard errors to adjust for clustering within schools (see Paluck, 2009b). Each regression controls for students’ grades, time spent on homework, news watching, political knowledge, extracurricular activities, gender, GPA, and ethnic-racial identity, to increase the precision of the estimates. There are no significant patterns of difference based on gender or racial-ethnic identity, so results are collapsed across these variables. I coded open-ended responses using *a priori* codes specified in collaboration with the ADL staff, and developed after reviewing the free response dataset (blind to experimental condition). An independent judge coded a random subsection, reaching an average reliability of $\alpha = .74$ and resolving differences through discussion.

Results

Sample characteristics

We interviewed 539 students before the spring Peer Training session began: 144 Peer Trainers, 143 Friends, and 252 Peers. We reached 60% of all Peer Trainers and 30% of all named classmates. Three quarters of these students were in the 10th or 11th grade, the classes from which Peer Trainers are typically chosen. Fifty-four percent were female, and 66% described themselves as European American, 11% as coming from a mixed racial or ethnic background, 9% as Hispanic, and 7% as African American.

Awareness

Seventy-three percent of Peer Trainers in treatment schools stated that they had overheard teasing in their school sometime “this week,” compared to only 42% of control Peer Trainers ($\beta = .94$, $se = .15$, $p < .05$). Only 4% of treatment Peer Trainers compared to 22% of control Peer Trainers stated that they “never” overheard teasing. A greater awareness of biased teasing did not spread to treatment Friends and Peers, who reported the same level of awareness as controls (percentages reporting awareness of teasing “this week” ranged from 45% to 49%).

Attitudes

Across all types of students in treatment and control schools, we observed high rates of agreement that prejudice and harassment is wrong and that students should stand up against it. However, we did find a significant treatment difference such that 92% of treatment Peer Trainers stated that students should *confront* harassers, compared to 85% of control Peer Trainers ($\beta = .56$, $se = .29$, $p < .05$).

Students’ open-ended justifications for confronting prejudice and harassment reveal that treatment Peer Trainers also offered more elaborated rationales for interpersonal confrontation than control Peer Trainers. Only 11% of treatment Peer Trainers vs. 29% of control Trainers explained that one should intervene “because it’s wrong” without further explanation ($\beta = -.94$, $se = .31$, $p < .05$). Treatment Peer Trainers were significantly more likely to respond that students should intervene out of responsibility to others or out of empathy or sympathy (54% vs. 45%, $\beta = .78$, $se = .26$, $p < .05$). Treatment Peer Trainers described this responsibility in terms of protecting school culture (e.g., “if you step in to stop teasers, this sets the tone for your school”), and in terms of the power of peer influence (e.g., “you should step in because students listen to other students”). They also cited empathy or sympathy (“I’d feel so badly for the person”). While the majority (70%) of treatment and control Peer Trainers thought that standing up for the targets of harassment could be effective, control Peer Trainers were more likely to point out that harassment is

² Previous research has used petition signatures as behavioral indicators to test the consistency of attitudes and behavior; see for example Kallgren and Wood (1986) and Borgida and Campbell (1982).

inevitable and that intervention would not work in the long run (28% vs. 18%, $\beta = -.51$, $se = .24$, $p < .05$).

There were no significant experimental differences between Friends and Peers in their closed or open-ended responses about confrontation of prejudice and harassment. Approximately 75% of each group in treatment and control believed that students should intervene.

Endorsement of “free speech, no matter what the person's views might be” was high in both treatment and control schools, but the intervention caused treatment Peer Trainers to moderate their endorsement. While 85% of control Peer Trainers agreed “strongly” with this statement, only 50% of treatment Trainers agreed strongly (on a 0–3 scale, $M_{treat} = 2.38$, $M_{control} = 2.84$, $\beta = -.95$, $se = .30$, $p < .05$). Tolerance of extreme political viewpoints did not significantly differ between treatment and control ($M_{treat} = 2.64$, $M_{control} = 2.52$, $\beta = .10$, $se = .15$). However, treatment Peer Trainers were significantly more likely to agree that structural discrimination exists; their modal response was “somewhat agree,” compared to control Peer Trainers’ “somewhat disagree” ($M_{treat} = 2.71$, $M_{control} = 2.24$, $\beta = .56$, $se = .23$, $p < .05$).

With respect to social distance, the Peer Training intervention increased Peer Trainers' stated comfort with a boss of a different religion ($M_{treat} = 2.75$, $M_{control} = 2.53$, $\beta = .42$, $se = .25$, $p < .05$), but the questions testing comfort with a teen of a different race or a teen who is gay revealed no treatment effect (race: $M_{treat} = 2.55$, $M_{control} = 2.62$, $\beta = -.02$, $se = .19$; gay: $M_{treat} = 2.65$, $M_{control} = 2.74$, $\beta = .16$, $se = .27$).

The treatment effects on Peer Trainers' attitudes did not spread to their Friends or Peers, with a few exceptions for Friends. Treatment Friends were significantly more likely than controls to acknowledge structural discrimination ($M_{treat} = 1.34$, $M_{control} = .93$, $\beta = .47$, $se = .28$, $p < .05$), and were significantly more likely to say that they would not mind having a boss of a different religion ($M_{treat} = 2.70$, $M_{control} = 2.33$, $\beta = .84$, $se = .26$; see Appendix A for all attitude item means and test statistics by group).

Behavior

Talking about prejudice

Treatment Peer Trainers reported talking about prejudice with their classmates, and feeling comfortable doing so, to a greater extent than control Peer Trainers ($M_{treat} = 2.55$, $M_{control} = 2.31$, $\beta = .46$, $se = .12$, $p < .05$). Treatment Friends also reported talking about prejudice and feeling comfortable with these conversations to a greater extent than control Friends, but the differences were not significant ($M_{treat} = 2.33$, $M_{control} = 2.23$, $\beta = .22$, $se = .16$). No significant differences were observed between treatment and control Peers ($M_{treat} = 2.21$, $M_{control} = 2.24$, $\beta = -.09$, $se = .14$).

Confronting prejudice and harassment

Eighty percent of all participants nominated at least one student as likely to confront prejudiced harassment; on average participants nominated two students. No study participant received more than a dozen nominations. Self-nominations hovered around 50% in both treatment and control.

Fifty-eight percent of treatment Peer Trainers, compared to 30% of control Trainers, was nominated as someone likely to stand up for students being teased or insulted ($\beta = .73$, $se = .30$, $p < .05$; see Fig. 2). Peer Trainers did not drive this treatment effect by nominating one another. We observed equivalent rates of nominations among fellow Peer Trainers (approximately 29%) in treatment and control schools.

Treatment Friends and Peers drove the experimental difference in Peer Trainer nomination rates. Thirty-one percent of treatment Friends and 17% of control Friends nominated Peer Trainers ($\beta = .62$, $se = .33$, $p < .05$); 35% of treatment Peers and 9% of control Peers nominated Peer Trainers ($\beta = .83$, $se = .33$, $p < .05$). The

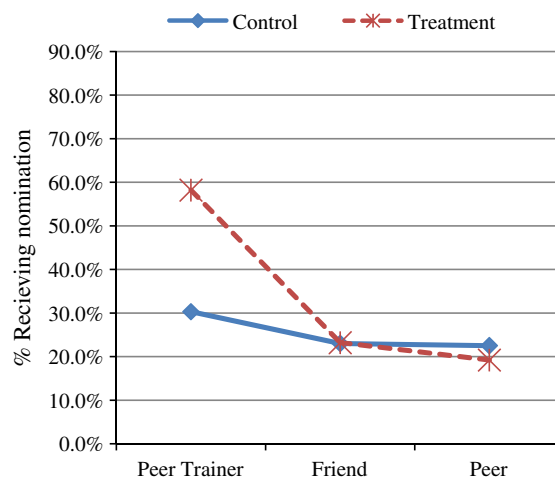


Fig. 2. Treatment Peer Trainers receive the most nominations as students who stand up for others.

likelihood of a treatment Peer nominating a Peer Trainer is even greater than the likelihood of a treatment Friend nominating a Peer Trainer, which is the inverse of what one would predict if nominations represented a biased “nominate your friends” pattern (see Fig. 3). Treatment Friends and Peers nominated slightly more students on average compared to control Friends and Peers ($M_{treat} = 2.0$, $M_{control} = 1.7$, ns), and did not receive significantly more nominations compared to control Friends and Peers.

Signing a petition

We dropped two students from the analysis who indicated that they did not believe their names would be posted to an actual website. Compliance with signing the environment petition was high across all groups—76% of all participants agreed to post their first and last names. A smaller percentage (59%) of the total sample signed the public gay rights petition. In the sample's only Catholic school, rates of signing the gay rights petition were significantly lower compared to all other schools in the experiment ($\beta = -.26$, $se = .11$, $p < .05$). Interviewers noted that a significant portion of students in the Catholic high school explained their refusal to sign the gay rights petition on the basis of their religious opposition to gay marriage “but not to other gay rights.” We dropped from subsequent analyses the pair of schools that included this Catholic school, given this particularistic pattern and the lack of a parochial control school.

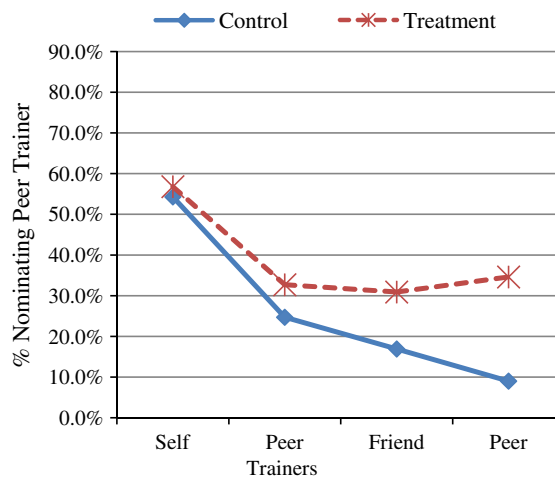


Fig. 3. Friends and Peers drive the experimental difference in Peer Trainer nominations.

Among secular schools, a significantly greater proportion of treatment students volunteered their names for the gay rights petition (66% vs. 52%), while there was no experimental difference in overall support of the environment petition. At an individual level, we observed a more pronounced preference for public support of the environment than of gay rights in control schools ($\beta = -.28$, $se = .16$, $p = .08$).

A greater percentage of treatment Peer Trainers signed the gay petition compared to control Peer Trainers, but the difference did not reach significance (64% vs. 55%; $\beta = .49$, $se = .48$). Unexpectedly, web activism on behalf of the environment was significantly higher among treatment compared to control Peer Trainers (84% vs. 71%, $\beta = .93$, $se = .28$, $p < .05$).

A significantly greater percentage of treatment Friends signed the gay petition relative to control Friends (73% vs. 56%, $\beta = .73$, $se = .14$, $p < .04$), and a significantly greater percentage of treatment Peers signed, compared to control Peers (61% vs. 47%, $\beta = .40$, $se = .15$, $p < .05$; see Fig. 4). Rates of signing the environment petition were similar among treatment and control Friends and Peers. (See Appendix B for all behavior item frequencies and test statistics by group.)

Experimental demand

At the end of the interview, we asked treatment students about their awareness of the Peer Training program. Sixty-seven percent of Friends and 58% of Peers in the treatment schools knew of the program. Their awareness is related, but not significantly, to nominating a Peer Trainer ($\beta = .68$, $se = .46$, $p = .14$), and to signing the gay rights petition (controlling for signatures on the environment petition; $\beta = .31$, $se = .19$, $p = .11$). One interpretation of these findings is that the visibility of Peer Trainer behavior—both their participation in the program and their confrontation of prejudice and harassment—contributed to Peer Trainer influence on close Friends and more distant Peers.

An alternative interpretation is that the experimental findings are demand-driven, such that treatment students nominated Peer Trainers and signed the gay rights petition at higher rates because students were aware of the Peer Training program and were responding to a perceived experimental demand to recognize and comply with the program goals in the questionnaire. We think this explanation is unlikely, given the exceptional measures we took to separate the study from the Peer Training program: Peer Trainers

were never informed of a study, and the interview was affiliated with a university and not with the ADL. Nevertheless, to address this concern empirically, we included two high-demand items at the end of the survey that gauged participants' motivation to self-present as tolerant.

The high-demand items asked students to self-report *change* in anti-prejudice and anti-harassment behavior. Specifically, on a scale of 0 (strongly disagree) to 3 (strongly agree), we asked treatment Peer Trainers to rate their agreement with: "After participating in the PT program...I am less likely to call someone a name" and "...I am more likely to stand up to discrimination and prejudice in my school." For treatment Friends and Peers, the statements' introduction was modified to read: "After having a program like the Peer Training program in my school..." and for all control participants the introduction was modified to read: "Since the start of this school year..."

In response to these items, both treatment and control participants reported positive change. However, participants in the control condition reported significantly *more* personal change, agreeing that they were more likely to stand up to discrimination and prejudice ($M_{\text{treat}} = 2.14$, $M_{\text{control}} = 2.30$; $\beta = -.44$, $se = .19$, $p = .02$) and to refrain from calling names ($M_{\text{treat}} = 1.97$, $M_{\text{control}} = 2.13$; $\beta = -.18$, $se = .07$, $p = .01$) since the start of the year. Using these variables to account for motivation to please the experimenter in the prediction of Peer Trainer nominations and petition signatures does not alter the significant relationship between the Peer Training intervention and treatment students' tolerant behavior.

In sum, control participants demonstrated greater motivation to self-present as tolerant relative to treatment participants, but treatment participants outperformed controls on measures of actual tolerant behavior. This juxtaposition runs counter to an interpretation of the experimental findings as driven by treatment participants' response to experimental demand. Moreover, the key measure of behavior—volunteering one's full name for a public gay rights petition—is an actual and not intended behavior, which is less subject to demand. It is also important to note that treatment Peer Trainers, who should have been most sensitive to demand after their participating in the program, were not more likely than control Trainers to nominate themselves as students who confront prejudice and harassment. Moreover, nomination patterns demonstrate that Peers, not Friends, are most likely to nominate treatment Peer Trainers. Peers are acquaintances and not necessarily friends with Peer Trainers, meaning that they should be least concerned with burnishing the Peer Trainers' reputation. Given all of the above, I conclude that the treatment effects should not be attributed to experimenter demand.

Discussion

A five-month high school intervention trained students ("Peer Trainers") from various subgroups within their school's social network to confront prejudice and harassment; at the end of five months we observed a significant and widespread pattern of effects attributable to the intervention. Peer Trainers in treatment schools were more likely than Peer Trainers in waiting list schools to be nominated by close friends and more distal peers as people likely to confront prejudice in their school. Treatment Peer Trainers' anti-prejudice behavior spread to these Friends and Peers, in the form of publicly standing up against prejudice on a gay rights Internet petition. Awareness of and attitudes toward prejudice and harassment, which shifted among treatment Peer Trainers, generally did not spread to Friends or Peers.

In response to the primary question of this study, I observe that peer influence on intergroup prejudice can spread throughout a social network, to individuals closely and distally tied to the peer model. Moreover, I observed the effects of peer influence across time and in a context outside of school, where the intervention took place. While

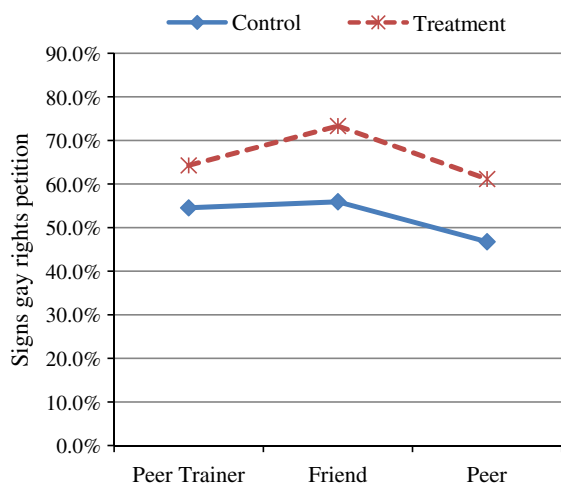


Fig. 4. Treatment students, especially Friends and Peers, are more likely to sign the gay rights petition.

the findings do not reveal the extent to which the Peer Trainer influence holds across all types of situations (Kallgren et al., 2000) they support the basic claim of Group Norms Theory that prejudice is strongly influenced by representatives of psychologically valued “reference” groups. More generally, these findings suggest that psychologists interested in peer influence on intergroup prejudice would do well to examine networks of relationships that extend beyond dyadic friendships or interpersonal contact.

In response to the second question of this study, I find that behavior and not attitudes spread across our observed social networks. This finding fits with theories of influence predicting behavioral compliance prior to internalization of positive attitudes toward the behavior (e.g., Cialdini, 2001, p. 83–88; Kelman, 1958). Interestingly, Kelman (1958) predicts that attitude internalization will eventually occur if the person modeling the behavior represents a valued identity; this suggests that Friends and Peers' attitudes will eventually converge with their behavior since Peer Trainers were selected as representatives of valued identity groups. However, I note that students' attitudes were not intolerant or pro-harassment in either the treatment or control schools. The power of this peer influence intervention in a relatively tolerant context may rest primarily in its ability to bring behavior in alignment with private attitudes, rather than to change attitudes themselves.

Thus, the spread of tolerant attitudes throughout a network merits further investigation in various contexts; the central finding of the current study is the spread of tolerant behavior. The study's measures of peer-reported and actual behavior are meaningful to the extent they demonstrate that (1), Peer Trainers' anti-harassment stance was visible to their social network and (2), peers' corresponding behavior was public and not superficially conformist. With respect to the first point, treatment students chose Peer Trainers out of all students in their school as individuals who stand up to prejudice and harassment, a strong corroboration of Peer Trainers' self-reported discussion of prejudice and harassment with people in their social network. Further, and critical for an understanding of how Trainers' influence was able to spread through the network, these nominations indicate that students in the network noticed Trainers' anti-prejudice and harassment behavior (independent of their awareness of the peer training program). With respect to the second point, students' signatures on the gay rights Internet petition indicate the kind of public denouncement of prejudice targeted by the intervention. However, while students understood that signatures would be public, their decision to sign was private. Friends' and Peers' behavior cannot be interpreted as mere conformity, because they could have declined to sign without the knowledge of Peer Trainers (for a similar measurement strategy see Blanchard et al., 1994).

An unexpected finding was that while treatment Peer Trainers signed the gay rights petition at greater rates relative to control, the difference was not significant. This finding is inconsistent with the student nomination and self-report data suggesting Peer Trainers acted as behavioral role models for their Friends and Peers. Why did treatment Trainers fail to behaviorally distinguish themselves, in a statistically significant manner, in the case of the petitions? It is possible that students who go through the Peer Training program are reluctant to become uniquely identified with the issue of prejudice and harassment. This reluctance may motivate them to publically align themselves with other causes, as treatment Peer Trainers did by signing the environmental petition in significantly greater numbers compared to control.³

Another possibility is that a moral credentialing process leads Peer Trainers to feel as though they already have advanced the cause of tolerance in their school, which allows a relative neglect of

the issue in other situations (Monin & Miller, 2001). Using the current data set, I cannot adjudicate among these plausible explanations, but I believe they are important topics for future research. Regardless, for the present study, the convergence of three other sources of behavioral reporting (from Peer Trainers, Friends, and Peers) that reveal treatment Trainers were significantly more likely to talk about and stand up against bias provides convincing evidence that treatment Trainers did serve as models of tolerance in their school.

The finding that students in the Catholic treatment school were not willing to sign the gay rights petition may represent a boundary condition on this kind of peer influence intervention. We have no empirical reason to believe that the Peer Trainers in the Catholic school were less dedicated or active than the Peer Trainers in other treatment schools; we simply find that their influence did not reach into a domain that is also targeted by the students' religion. In contrast to the small group of Peer Trainers, the Catholic students' sources of religious influence are manifold, including schoolteachers, church figures, parents, and the wider religious community. Attitudes and behaviors that are strongly reinforced by family and community may only respond to influence that is embedded in a new ecological context, for example a college campus where both peers and authority figures support a different ideological or religious viewpoint (e.g., Newcomb, 1943).

Limitations and future research

One limitation of the present data collection is that we captured Peer Trainers' “egocentric” networks, defined by their personal chains of friendship and acquaintance, rather than the whole social network of the school. When researchers can “see” the entire network, they can measure the proportion of all students who are reached and examine which students are reached—for example, students connected to diverse friendship cliques vs. homogenous or isolated cliques. By identifying the development and spread of attitude and behavior patterns within the entire setting, “saturated” or whole network surveys can thus test some broader implications of peer influence, such as the development of school-wide behavioral expectations (e.g., for intergroup relationships; Shelton & Richeson, 2005), perceived social norms (e.g., of racial stereotyping, Sechrist & Stangor, 2001), and a school “culture” of tolerance or prejudice (Crandall & Stangor, 2005).

As mentioned in the Introduction, the goal of this research was to identify whether and what kind of prosocial peer influence spreads across a social network. The mechanisms causing this spread were of secondary interest, in part because they have already been studied to a great extent in the laboratory, and in part because the study was designed to maximize the likelihood of capturing a causal main effect. My review of the literature demonstrates it is causal effects within real world social networks that are missing from current accounts of peer influence on prejudice and of social influence more generally. Identifying the mediating variables of these effects with some degree of causal certainty is a difficult task that will take several iterations of future field research (see Bullock, Green, & Ha (2010) for a cogent discussion of the overlooked data requirements for mediation, which necessitate, among other things, validation across numerous studies). Mediation explanations for the spread or the limits of peer influence abound; future field studies using different methodological designs will adjudicate among various explanations proffered from theory and laboratory evidence.

This study proposes one testable sequence of change out of the finding that behavior spreads more quickly and extensively than attitudes. However, this account is troubled by two factors—first, the lack of explicit test of this sequence, and second, a few empirical results that complicated the claim, such as the lack of statistical significance for the treatment Trainers' petition signing, and relative

³ I thank Deborah Prentice for suggesting this point.

levels of tolerance in the schools, which did not leave a wide bandwidth for attitude change. Future studies should feature longitudinal data collection, including a pretest, to better detect the sequence of change. Adding a pretest measuring students' private intergroup attitudes and their public intergroup behavior could also be used to formulate varying intervention strategies that isolate the motivational mechanisms of peer influence. For example, a pretest could indicate whether peer influence should be directed at motivating peers' behavior (because private attitudes are against confronting prejudice) or at licensing peer behavior (because private attitudes favor confronting prejudice; see Prentice & Miller, *in press*).

Studying social influence within networks offers many opportunities for psychologists interested in testing theories of influence and change in behavior, attitude, social norms, and even culture. The present study offers insights for these future tests, in the context of intergroup prejudice and harassment.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at doi:10.1016/j.jesp.2010.11.017.

References

- Aboud, F. E., & Doyle, A. B. (1996). Does talk of race foster prejudice or tolerance in children? *Canadian Journal of Behavioural Science*, 28, 161–170.
- Aboud, F., & Joong, A. (2008). Intergroup name-calling and conditions for creating assertive bystanders. In S. Levy & M. Killen (Eds.), *Intergroup attitudes and relations in childhood through adulthood* (pp. 249–260). Oxford: Oxford University Press.
- Asch, S. (1956). Studies of independence and conformity: A minority of one against a unanimous majority. *Psychological Monographs*, 70.
- Avery, P. G., Bird, K., Johnstone, S., Sullivan, J. L., & Thalhammer, K. (1992). Exploring political tolerance with adolescents. *Theory and Research in Social Education*, 20, 386–420.
- Bearman, P., & Moody, J. (1994). Suicide and friendships among American adolescents. *American Journal of Public Health*, 94, 89–95.
- Blanchard, F., Crandall, C., Brigham, J., & Vaughn, L. (1994). Condemning and condoning racism: A social context approach to interracial settings. *The Journal of Applied Psychology*, 79, 993–997.
- Blanton, H., & Christie, C. (2003). Deviance regulation: A theory of action and identity. *Review of General Psychology*, 7(2), 115–149.
- Borgida, E., & Campbell, B. (1982). Belief relevance and attitude-behavior consistency: The moderating role of personal experience. *Journal of Personality and Social Psychology*, 42, 239–247.
- Bullock, J., Green, D., & Ha, S. (2010). Yes, but what's the mechanism? (Don't expect an easy answer). *Journal of Personality and Social Psychology*, 98, 550–558.
- Christakis, N., & Fowler, J. (2009). *Connected: The surprising power of our social networks and how they shape our lives*. London: Little Brown.
- Cialdini, R. (2001). *Influence: Science and practice* (5th Edition). Needham Heights, MA: Allyn & Bacon.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. In S. T. D. L., & C. (Eds.), *Annual review of psychology*, Vol. 55. (pp. 591–621): Annual Reviews, Inc.
- 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, 967–983.
- Crandall, C. S., & Eshleman, A. (2003). A justification-suppression model of the expression and experience of prejudice. *Psychological Bulletin*, 129, 414–446.
- Crandall, C. S., Eshleman, A., & O'Brien, L. (2002). Social norms and the expression and suppression of prejudice: The struggle for internalization. *Journal of Personality and Social Psychology*, 82(3), 359–378.
- Crandall, C., Merman, A., & Hebl, M. (2009). Anti-fat prejudice. In Todd D. (Ed.), *Handbook of prejudice, stereotyping, and discrimination* (pp. 469–487). New York, NY, US: Psychology Press.
- Crandall, C. S., & Stangor, C. (2005). Conformity and prejudice. In J. F. Dovidio, P. Glick, & L. A. Rudman (Eds.), *On the nature of prejudice: Fifty years after Allport* (pp. 295–309). Malden, MA: Blackwell.
- Czopp, A. M., Monteith, M. J., & Mark, A. Y. (2006). Standing up for a change: Reducing bias through interpersonal confrontation. *Journal of Personality and Social Psychology*, 90, 784–803.
- Derman-Sparks, L., & Phillips, C. (1997). *Teaching/learning anti-racism: A developmental approach*. New York: Teachers College Press.
- Duncan, G. J., Boisjoly, J., Levy, D. M., Kremer, M., & Eccles, J. (2003). *Empathy or antipathy? The consequences of racially and socially diverse peers on attitudes and behaviors* (JCPWR Working Paper No. 326). Chicago: Joint Center for Poverty Research, Northwestern University/ University of Chicago.
- Ford, T. E., & Ferguson, M. A. (2004). Social consequences of disparagement humor: A prejudice norm theory. *Personality and Social Psychology Review*, 8, 79–94.
- Graham, S., Taylor, A. Z., & Ho, A. Y. (2009). Race and ethnicity in peer relations research. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 394–413). New York, NY: The Guilford Press.
- Green, D., & Wong, J. (2009). Tolerance and the contact hypothesis: A field experiment. In E. Borgida (Ed.), *The political psychology of democratic citizenship*. Oxford: Oxford University Press.
- Hardin, C. D., & Conley, T. D. (2000). A relational approach to cognition: Shared experience and relationship affirmation in social cognition. In G. B. Moskowitz (Ed.), *Future directions in social cognition*. Hillsdale, NJ: Erlbaum. PDF.
- Hawkins, D., Pepler, D., & Craig, W. (2001). Naturalistic observations of peer interventions in bullying. *Social Development*, 10, 512–527.
- Horn, S. (2007). Adolescents' acceptance of same-sex peers based on sexual orientation and gender expression. *Journal of Youth and Adolescence*, 36, 363–371.
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion*. New Haven, CT: Yale University Press.
- Jaccard, J., Blanton, H., & Dodge, T. (2005). Peer influences on risk behavior: An analysis of the effects of a close friend. *Developmental Psychology*, 41(1), 135–147.
- Juvonen, J., & Graham, S. (Eds.). (2001). *Peer harassment in school: The plight of the vulnerable and victimized*. New York: Guilford Press.
- Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, 26, 1002–1012.
- Kallgren, C., & Wood, W. (1986). Access to attitude-relevant information in memory as a determinant of attitude-behavior consistency. *Journal of Experimental Social Psychology*, 22, 328–338.
- Kelman, H. C. (1958). Compliance, identification and internalization: Three processes of attitude change. *Journal of Conflict Resolution*, 2, 51–60.
- LaFrance, M., & Woodzicka, J. A. (1998). No laughing matter: Women's verbal and nonverbal reactions to sexist humor. In J. Swim & C. Stangor (Eds.), *Prejudice: The target's perspective* (pp. 61–80). Boston: Academic Press.
- Latané, B. (2000). Pressure to uniformity and the evolution of cultural norms: Modeling dynamics of social impact. In C. L. Hulin & D.R. Ilgen (Eds.), *Computational modeling of behavior in organizations* (pp. 189–215). Washington, DC: American Psychological Association.
- Liebkind, K., & McAlister, A. (1999). Extended contact through peer modeling to promote tolerance in Finland. *European Journal of Social Psychology*, 29, 6–765–770.
- Lopez, G., Gurin, P., & Nagda, B. R. (1998). Education and understanding structural causes of group inequalities. *Political Psychology*, 19, 305–329.
- Lun, J., Sinclair, S., Glenn, C., & Whitchurch, E. (2007). (Why) do I think what you think? Epistemic social tuning and implicit prejudice. *Journal of Personality and Social Psychology*, 93, 957–972.
- Monin, B., & Miller, D. T. (2001). Moral credentials and the expression of prejudice. *Journal of Personality and Social Psychology*, 81(1), 33–43.
- Newcomb, T. M. (1943). *Personality & social change: Attitude formation in a student community*. New York: Dryden Press.
- Nowak, A., & Vallacher, R. R. (2001). Societal transition: Toward a dynamical model of social change. In W. Wosinska, R. B. Cialdini, D. W. Barrett, & J. Reykowski (Eds.), *The practice of social influence in multiple cultures* (pp. 151–171). Mahwah, NJ: Erlbaum.
- O'Connell, P., Pepler, D., & Craig, W. (1999). Peer involvement in bullying: Insights and challenges for intervention. *Journal of Adolescence*, 22, 437–452.
- Paluck, E. L. (2009). Reducing intergroup prejudice and conflict using the media: A field experiment in Rwanda. *Journal of Personality and Social Psychology*, 96, 574–587.
- Prentice, D., & Miller, D. (in press). Psychological levers of behavior change. In E. Shafir (Ed.), *The behavioral foundations of policy*. Princeton University and Russell Sage Foundation Press.
- Schultz, P. W., Nolan, J., Cialdini, R., Goldstein, N., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18, 429–434.
- Sechrist, G., & Stangor, C. (2001). Perceived consensus influences intergroup behavior and stereotype accessibility. *Journal of Personality and Social Psychology*, 80, 645–654.
- Shelton, J. N., & Richeson, J. A. (2005). Intergroup contact and pluralistic ignorance. *Journal of Personality and Social Psychology*, 88, 91–107.
- Shelton, J. N., & Stewart, R. E. (2004). Confronting perpetrators of prejudice: The inhibitory effects of social cost. *Psychology of Women Quarterly*, 28, 215–223.

- Sherif, M., & Sherif, C. W. (1953). *Groups in harmony and tension*. New York: Harper.
- Shook, N. J., & Fazio, R. H. (2008). Interracial roommate relationships: An experimental field test of the contact hypothesis. *Psychological Science*, *19*(7), 717–723.
- Sinclair, S., Lowery, B., Hardin, C., & Colangelo, A. (2005). Social tuning of automatic racial attitudes: The role of affiliative motivation. *Journal of Personality and Social Psychology*, *89*, 583–592.
- Smith, J., & Louis, W. (2008). Do as we say and as we do: The interplay of descriptive and injunctive group norms in the attitude–behavior relationship. *The British Journal of Social Psychology*, *47*, 647–666.
- Stangor, C., Sechrist, G. B., & Jost, J. T. (2001). Changing racial beliefs by providing consensus information. *Personality and Social Psychological Bulletin*, *27*, 484–494.
- Swim, J. K., & Hyers, L. L. (1999). Excuse me—What did you just say?!: Women's public and private responses to sexist remarks. *Journal of Experimental Social Psychology*, *35*, 68–88.
- van Laar, C., Levin, S., Sinclair, S., & Sidanius, J. (2005). The effect of college roommate contact on ethnic attitudes and behavior. *Journal of Experimental Social Psychology*, *41*, 329–345.
- Wasserman, S., & Faust, K. (1994). *Social network analysis*. Cambridge: Cambridge University Press.