

The Salience of Social Referents: A Field Experiment on Collective Norms and Harassment Behavior in a School Social Network

Elizabeth Levy Paluck and Hana Shepherd
Princeton University

Persistent, widespread harassment in schools can be understood as a product of collective school norms that deem harassment, and behavior allowing harassment to escalate, as typical and even desirable. Thus, one approach to reducing harassment is to change students' perceptions of these collective norms. Theory suggests that the public behavior of highly connected and chronically salient actors in a group, called *social referents*, may provide influential cues for individuals' perception of collective norms. Using repeated, complete social network surveys of a public high school, we demonstrate that changing the public behavior of a randomly assigned subset of student social referents changes their peers' perceptions of school collective norms and their harassment behavior. Social referents exert their influence over peers' perceptions of collective norms through the mechanism of everyday social interaction, particularly interaction that is frequent and personally motivated, in contrast to interaction shaped by institutional channels like shared classes. These findings clarify the development of collective social norms: They depend on certain patterns of and motivations for social interactions within groups across time, and are not static but constantly reshaped and reproduced through these interactions. Understanding this process creates opportunities for changing collective norms and behavior.

Keywords: social norms, social influence, social conflict, social networks, relational aggression, bullying

Classic and contemporary experiments have demonstrated the power of social norms over individuals' judgment and behavior (Asch, 1955; Blanchard, Crandall, Brigham, & Vaughn, 1994; Cialdini & Goldstein, 2004; Sherif, 1936). Most experimental studies of social norms test the influence of a perceived situational norm, meaning the perceived social consensus regarding which judgments or behaviors are appropriate in the immediate situation (Miller & Prentice, 1996). These types of social norms apply to that situation only; their influence is not expected to carry over to judgments or behavior in other situations.

However, individuals also develop ideas about social norms that apply to a larger collection of situations, situations that are populated by a wider community of people who interact repeatedly. These types of "collective" social norms describe the norms that arise in a school, an organization, or a nation. The social influence, organizational, and cultural psychology literatures provide many examples of collective social norms and their influence on important patterns of behavior and cognition across time. For instance, college students' perception that binge drinking is common on campus increases campuswide alcohol consumption (Prentice & Miller, 1993). Bullying and harassment in secondary schools is fostered by a perceived social consensus among students that speaking out against such behavior is wrong (Juvonen & Cadigan, 2002). Finally, patterns of counterfactual thinking in Eastern and Western cultures are perpetuated by cultural members' perceptions of a social consensus regarding the most valued means for achieving ends (Zou et al., 2009).

Despite powerful evidence of collective normative influence over individual and group behavior and cognition, very little research addresses how individuals identify these social norms (cf. Kitts, 2003, Shepherd, 2012). To date, psychological research has tested the impact of norms when they are presented to individuals through public opinion data or experimental confederates. To understand the means by which individuals learn about collective social norms in the course of their everyday experience, psychologists can examine the social cues that individuals use to generalize across large numbers of people and situations. These social cues might include particularly salient individuals, behaviors, or public expressions. Identifying the social cues individuals use to

This article was published Online First September 17, 2012.

Elizabeth Levy Paluck and Hana Shepherd, Department of Psychology and Public Affairs, Princeton University.

A research grant from Princeton University awarded to Elizabeth Levy Paluck provided support for this research. We gratefully acknowledge the collaboration, generosity, and support of our high school research site, its staff and students, and in particular Kelly Bocuzzo and Alan Paluck, whose energy and dedication made this project possible. We received important feedback from Peter Aronow, Peter Bearman, Hart Blanton, Mina Cikara, Alin Coman, Paul DiMaggio, Donald Green, Deborah Prentice, Matthew Salganik, Ezra Zuckerman, and members of colloquia at the Russell Sage Foundation, Society for Personality and Social Psychology, and the Theorodology workshop at Princeton. Izzy Gainsburg, David Mackenzie, and Ani Momjian provided superior research support. All errors are our own.

Correspondence concerning this article should be addressed to Elizabeth Levy Paluck, Green Hall, Department of Psychology and Public Affairs, Princeton University, Princeton, NJ 08540. E-mail: epaluck@princeton.edu

learn about collective social norms is important for understanding the persistence of norms and behavioral patterns in a collective, as well as instances of change in norms and behavior.

In this article, we test the hypothesis that highly connected and chronically salient individuals in a community provide cues as to the social norms of the collective. To test this hypothesis, we use a randomized intervention within a repeatedly measured, complete high school social network. Although individuals likely infer collective social norms from a host of cues, theories describing the influence of social reference groups and situational social interactions suggest that certain individuals, or social referents (Sherif & Sherif, 1964), will shape inferences about collective norms significantly more than others. We test the way in which cues from these social referents are transmitted to their peers through everyday social interaction, specifically, interaction that is frequent and personally motivated, as opposed to interaction shaped by institutional channels like shared classes.

Social Referents Provide Cues to Collective Norms

How Individuals Identify Social Norms

Social psychological theory predicts that individuals form their ideas about what is socially normative in a social context or within a community by observing other people's public behavior. The power of that perceived norm over individuals' own cognition or behavior depends on the extent to which they perceive the norm to be universally endorsed, and the extent to which they feel personally tied to the context or community (Miller & Prentice, 1996; Sherif, 1936).

For example, when an individual observes a person littering in a parking lot, the littering behavior may not serve as a cue to a littering norm if there are signals that the behavior is not universally endorsed, such as another person picking up trash or a previous experience in the parking lot in which no one littered (Cialdini, Reno, & Kallgren, 1990). Additionally, individuals may reject the influence of norms belonging to a context or community if they are motivated to define their identity in opposition to that context or community, as in the case of "fringe groups" (Blanton & Burkley, 2008; Blanton & Christie, 2003), or if they feel they do not fit the community prototype, as in the case of female undergraduates at a traditionally male university (Hogg, 2010; Prentice & Miller, 1993).

In sum, public behaviors influence perceptions of social norms when the behaviors seem broadly endorsed and when the perceiver feels personally tied to the context or community in which the behavior takes place. Given these conditions, it is reasonable to ask *whose* behavior contributes the most to individuals' perceptions of norms in a context or community. This question is particularly relevant for understanding how individuals infer norms within a wider community where individuals interact repeatedly across different situations. Are there particular types of people in the community whose behavior is more likely to be perceived as universally endorsed, and as personally relevant? Do certain people "count" more when individuals draw inferences about collective norms in the course of their everyday lives?

How Individuals Identify Collective Norms Through Social Referents

When individuals form an impression of how most people in a community feel about, for example, race relations, they do not

comprehensively account for each person's apparent racial attitudes and compute an unweighted modal or average collective position. We revisit and test the long-standing hypothesis that the public behaviors of highly connected and chronically salient actors in a group, called social referents, provide normative cues regarding what is acceptable and desirable for group members (Sherif & Sherif, 1964). For each individual group member, social referents are most influential over stable perceptions of collective norms when the individual is personally connected to the referent and repeatedly observes the referent across situations. Personal connections are critical to referents' influence because perceivers infer more social information from and are more influenced by people with whom they have an affinity or felt connection (Hardin & Higgins, 1996; Hogg, 2010). Repeated observation of social referents in various situations is important because individuals do not identify norms on the basis of their accumulated experience and knowledge (Miller & Prentice, 1996), but rather on the basis of immediate context in which the norms are relevant (Kallgren, Reno, & Cialdini, 2000; Miller & Prentice, 1996).

We examine the influence of two types of social referents in a collective. One type is a widely known individual, who has many ties to individuals across the network (i.e., the ties are not clustered among a subgroup, but span several subgroups in the network). Widely known people are personally connected to many members of the community. As a result of their reach across the social network, and, relatedly, because they are often respected and considered popular by others, their behavior may be identified as representative of the collective group identity. Additionally, due to the extent of their relations in the network, their behavior is likely to be more frequently observed across situations in the community.

A second type of person who is theoretically well positioned to shape perceptions of collective norms is a leader of a subgroup, or "clique," within the community, such as a friendship clique in a school. These individuals have a large number of social relations, but their relationships are largely concentrated within a subgroup in which the subgroup members have social relations with one another. A clique leader's behavior is frequently observed by clique members because they interact with one another more often than they do with others in the community. Also, leaders of cliques are highly connected to other members of the clique. In particular, connections in a clique may be marked by high levels of identification with the clique leader referent, because membership in cliques grant individuals a feeling of uniqueness as well as one of belongingness (Pickett, Silver, & Brewer, 2002). Thus, the norms inferred within an individual's subgroup are less likely to be rejected as unrepresentative of the individual's identity (Blanton & Christie, 2003).

Widely known individuals and leaders of cliques should have a greater influence than other members of a community over perceived collective norms. However, each type of individual may also have a slightly different impact. For example, due to their relatively wider reach across the social network and their status in the group, widely known people may seem more relevant for inferring collective norms as they may be perceived as more representative of the group as a whole. At the same time, clique leaders may be particularly capable of influencing personal attachment to collective norms and enforcing costly or socially riskier behavior, due to their greater personal relevance to group members

and to group members' tightly knit and frequent interactions allowing for ongoing monitoring and reinforcement.

Overall, understanding who can influence individuals' perceptions of collective social norms may help us to understand how to *change* chronically perceived norms and behavioral patterns in a community. The main goal of this research was to understand whether and through what channels these theoretically identified social referents of a community can significantly shape their peers' perceptions of collective norms in their community. Importantly, we also examine whether those changes in perceived collective norms are accompanied by changes in the behaviors that are prescribed or proscribed by those norms.

The Present Research: Measuring Social Referents' Influence Across a Social Network

We investigate the source of cues about a problematic norm within a community, specifically, the norm of peer harassment in a high school. Using a saturated survey and social network analysis to map the entire social network of the school, we are able to identify social referents at the school, both widely known and clique leader social referents. We randomly assign a subset of these social referents to an intervention involving a schoolwide assembly in the fall and public reminders of the assembly for the rest of the year, in which the intervention social referents demonstrate their opposition to harassment and support for behavior that can de-escalate conflict. The influence of the intervention social referents is measured net of the influence of the remaining control social referents. Specifically, we test whether the intervention social referents' public behavior changes their peers' perceptions of the school norm of harassment and behavior.

We further predict that intervention social referents will influence their peers through the mechanism of everyday social interaction that is frequent and personally motivated. Specifically, interactions that students initiate with social referents should be the most influential channel for perceiving cues about collective norms, compared with incidental or institutionally driven interaction. When students are personally motivated to interact with social referents in or outside of the classroom, social referents' behavior should be noticed more and weighed more heavily in students' inferences about the collective norm, relative to interactions that are a consequence of a school administrator's decision to put students in the same class or study hall. In addition, we hypothesize that the more frequent the interactions with social referents, the stronger their influence on their interaction partners' perceptions of the collective norm. Thus, we use reports of students' self-selected social interactions at three points throughout the year to test the idea that the influence of ties to intervention social referents will be relatively greater if students are exposed to them in frequent and personally motivated everyday social interaction.

In sum, our research questions are: Does greater social interaction with intervention social referent students over the course of the school year significantly shape their peers' perception of the school's collective social norm regarding harassment? Does greater social interaction change their peers' harassment behavior? In this research, we explored how collective norms are identified by testing whether the widely known and clique leader students' behavior can communicate a more tolerant collective norm through everyday social interactions. In doing so, in this research

we answer the more general call to understand the wider consequences of social influence within social networks (Mason, Conrey, & Smith, 2007) and follow a tradition of empirical research attempting to understand peer influence within networks on behavior (e.g., Bearman & Moody, 2004; Coleman, Katz, & Menzel, 1957). To our knowledge, this is the first time that influence across a naturally occurring social network has been tested with an experiment, in which influence agents are randomly assigned to treatment on the basis of their position in the network. As such, the study is one of the first to measure the causal influence of certain individuals in a network on collective norms and behavioral patterns through the course of everyday interaction.

Prejudice and Harassment in Schools

Many high schools in the United States and abroad report harmful and cyclical patterns of student-to-student harassment in schools (e.g., Graham, 2006; Juvonen & Galván, 2008). The harassment is often cyclical in the sense that harassment prompts a response from the target and often from the targets' friends, which triggers a reaction from the initial student and her or his friends, thereby broadening and fueling the behavioral cycle. The type of harassment varies from school to school, but common themes include harassment on the basis of ethnic or racial identity, appearance, sexual orientation, or rumored sexual activity. Increasingly, harassment takes place online, on social networking sites like Facebook, and through phone texting, but it also occurs verbally in person and sometimes physically. Although many intervention programs label such behavior *bullying*, adolescents often resist this label and instead choose descriptors like "being mean" and "making drama" (Faris & Felmlee, 2011; Marwick & Boyd, 2011).

Crucially, harassment behavior is not strongly related to students' personal values or attitudes regarding tolerance generally or harassment specifically. Harassment is typically widespread throughout the social network of a school; students at almost all levels of the school hierarchy participate (Faris & Felmlee, 2011), despite variation in their personal orientations toward harassment. This suggests that changing patterns or levels of harassment in a school will not come from changing students' private attitudes, values, or beliefs, which are the target of many existing anti-bullying interventions.

Instead, researchers have described high rates of harassment behaviors as stemming from perceptions of a social consensus concerning harassment behaviors at the school (e.g., Juvonen & Cadigan, 2002). For example, many students do not personally like or approve of harassment, but their private attitudes do not translate into behaviors aimed at discouraging harassers, defending victims, or withdrawing from the cycle of harassment by refusing to engage in conflict or that of their friends. Students interpret their peers' failure to take action as implicit endorsement of the harassment. In other words, peer behavior communicates social norms regarding the acceptability of harassment and the unacceptability of standing up against it or withdrawing from it. These perceived social norms motivate harassment and inhibit behaviors that de-escalate conflicts (see also Prentice & Miller, 1993). The chronic activation of harassment norms in schools is perhaps an important feature of what is frequently described as a schoolwide "culture of harassment" (Bradshaw & Waasdorp, 2009).

Method

Experimental Context

We studied a small public high school ($N = 291$) that drew students from urban and suburban areas of Connecticut. Teachers had observed high levels of harassment among students in previous years, and as a response, the school invited the Anti-Defamation League (ADL) to run an intervention program called "Names Can Really Hurt Us" (referred to below as NAMES). The NAMES intervention prepares a small group of selected students to present their experiences of and reasons to oppose harassment in a schoolwide assembly. Peer harassment is defined as verbal or physical abuse and social ostracism among peers.

Prior to the intervention, we analyzed the complete pattern of relationships among students (the school's social network) in order to identify a pool of widely known and clique leader social referent students and then randomly assign a subset of those social referents to participate in the program. Participation included leading the schoolwide assembly and, later, providing reminders about the themes of the program through publicity campaigns during the remainder of the school year. We first describe the saturated school survey to illustrate how we identified the social referent students within the school's social network while measuring students' perceived norms, beliefs, and experiences of harassment prior to the intervention.

Schoolwide Survey: Social Network and Norms Measurement

One week after school began in September, we administered a survey during a single class period to every student in the school ($N = 260$ due to absences on the survey day and in the days following; 56% female; 44% African American, 23% Latino, 21% White; 59% of students were new to the school that year; see Table 1A). Parents signed a consent form for their child to participate, and students also provided informed consent. The survey consisted of four parts: demographic information, questions about relationships with other students at the school (our social network questions), personal beliefs about and experiences of harassment-related events at the school, and perceptions of collective social norms regarding harassment at the school. On the basis of previous work on harassment and bullying in schools, and on initial qualitative work at the school, we used the term *making drama* to refer to harassment in all relevant survey questions (which was defined in the survey as "talking behind the backs of other students or to their faces in a mean or rude way; spreading rumors by text, Facebook, MySpace posts, or instant messaging (IMs); giving other students mean or rude looks in the hall"; Marwick & Boyd, 2011).

Network questions. Six questions elicited students' relationships with other students at the school. Four asked about friendships at the school in behavioral terms ("With whom did you spend time in the last week?"; "With whom did you communicate online last week?"; "Who would defend you if you were having 'drama' with other students?"; "Who would you talk to if something bad or upsetting happened to you?"). Two questions elicited nominations of high status peers (i.e., students at the school "who you really respect" and "who you think are most popular"). We followed

recommended procedures (Marsden, 2005) by providing each student with a complete roster of students in the school, arranged by grade, sorted alphabetically by first name, and numbered. Students used the numbers¹ to nominate as many students as they wanted for each question.

We use the spending time together question, measured two more times throughout the year, to approximate the frequency with which a student is exposed to the behavior of their peers, and to indicate with whom students are personally motivated to spend time. Frequent and personally motivated everyday interaction is the proposed mechanism through which social referents influence perceived collective norms and behavior. We use this particular question to map the social interactions through which we trace the influence of the intervention and control social referents.

Collective norms. We used a series of eight questions to measure perceptions of prescriptive norms regarding harassment at the school, specifically, perceptions of student approval of harassment, of behavior that can deescalate harassment, and of students' rationale for harassment. First we assessed an overall prescriptive norm of harassment: "How many students at [school] believe it's normal when students start drama or any other kind of conflict with other students?" For norms regarding behavior to deescalate conflict, we asked: "How many students at [school] believe it's wrong, or would criticize you, if you tried to stop other students from starting drama?"; "... believe it's wrong, or would criticize you, if you did not defend your friends when someone else was making drama for them?"; "... believe it's wrong, or would criticize you, if you ignored rumors about you, rather than defending yourself?"; "... believe it's normal to mind your own business when other students are starting drama for people?" and "believe it is important to defend your friends when someone is making drama for them?"

As we learned through interviews at the school, behaviors that deescalate conflict are not necessarily interventionist behaviors in which students defend their friends or step into the middle of conflict. One student stated: "I can see helping out if someone's pushing you into a locker, but when they're saying stuff before class and you're just like 'don't talk to my friend like that' and you start talking too, that's just starting more problems" (Student DE, personal communication, June 2011). Instead, teachers and students identified behaviors like stepping back, minding one's own business, and not grouping together to defend friends as behaviors that prevent future conflict. We next assessed norms regarding a rationale for harassment behavior: "How many students at [school] believe that sometimes students deserve to have rumors spread about them?"; and "... believe that students are seriously negatively affected when they are targeted by rumors, gossip, or other drama?"

Students responded to these questions using a pictogram with six options, each of which featured a collection of outlined stick figures. The proportion of shaded figures in each picture represented the percentage of students at the school who believed or supported the statement (1 = *Nobody*, no shaded figures, 3 =

¹ In the first wave of the survey, students were asked to write down both the name and number of other students they nominated in network questions. Due to students' concerns about the confidentiality of the information, we only asked them to record the other students' identification numbers and not their names, in Waves 2 and 3 of the survey.

About 50%, half-shaded figures, 6 = *Almost everybody*, all shaded figures). This method for eliciting perceptions of social norms differs from the method most commonly used where researchers ask for perceptions of what the “average person” in the group does (e.g., Prentice & Miller, 1993). By using percentages, we hoped to capture students’ perceptions of the sentiments of the collective as opposed to sentiments of each individual’s idea of a prototypical group member.

For the prescriptive norm questions, the success of the intervention would be evidenced by perception of less widespread approval for behaviors supporting harassment. Put differently, students would perceive behaviors that deescalate conflict such as stopping others from “starting drama,” refusing to participate in the conflicts of friends, and ignoring instead of engaging rumors about oneself to be more desirable and normal at the school. Answers to the questions pertaining to a rationale for harassment indicate a successful intervention when students perceive a widespread belief that students are seriously negatively affected by gossip and rumors, because this perception should make students less likely to participate in harassment.

Another series of questions addressed students’ perceptions of descriptive norms (e.g., “How often do students . . . spread rumors about students at [school],” “. . .forward or send emails, IMs, or texts to other students to gossip about or threaten someone,” “threaten [one another] with physical violence,” “. . .act as a negotiator to calm down a conflict or break up a fight,” and “. . .stand up for someone when they are being insulted or harassed?”). Students responded to these questions using a 4-point scale (from 1 = *Never* to 4 = *Several times a week*). We consulted with school staff and students in order to capture school-specific issues and appropriate language.

Personal beliefs and experiences. Three questions addressed personal beliefs about and experiences with harassment at the school: “Do you think there is a problem of too many students gossiping, spreading rumors, or making drama for each other?”; “Do you personally have a problem of students gossiping, spreading rumors, or making drama for you?”; and “Do you think that students are seriously emotionally affected when people gossip or spread rumors about them or when people make drama for them?” Students responded using a 4-point scale (from 1 = *Not at all* to 4 = *Very much*).

Second- and third-wave surveys. We administered the social network and norms survey described above to the entire school two more times: 1 week after the intervention described below ($N = 250$, 57.2% female) and at the end of the school year ($N = 220$, 58.18% female). A total of 278 unique students completed at least one wave of the survey; 190 students completed all three waves. We added questions to Wave 3, described below.

Close friend norms. Wave 3 reframed two of the collective prescriptive norms questions to determine how students perceived the norm within their close friendship group. Specifically, we asked “How many of your *close friends* believe that it’s normal to start drama or any other kind of conflict with other students,” and “. . .believe it’s wrong, or would criticize you, if you tried to stop other students from starting drama?” Students responded using the 6-point pictogram.

Cognitive salience and endorsement of the program. As a measure of the cognitive salience of the program and of the intervention social referent students who participated in it, Wave 3

of the survey assessed students’ memory for the hallway intervention poster slogans (described below) by asking students to recall one of the slogans. At Wave 3, students also recalled how many of their good friends had participated in the NAMES intervention. As a measure of students’ endorsement of the underlying themes of the program, Wave 3 asked each student to vote on whether a program like NAMES should be implemented the following year at their school.

Identification of Social Referent Students

We used social network questions from the first survey to construct the complete network of relationships among students at the school. The complete network of student relationships is represented by a square matrix in which the rows and the columns contain every student in the school. If, for example, Student 125 reported that she spent time with Student 130, then the cell at the intersection of row 125, column 130, would receive value 1. We combined the results of the four friendship-related questions into one matrix. In a different matrix, we combined the results of the two status questions. We combined questions in order to create robust networks that captured several dimensions of relationships, and because some questions elicited higher response rates than others. The combination of questions was not additive; if Student A named Student B as someone she spent time with last week and as someone who would defend her, the cell at the intersection of Students A and B in the friendship matrix has a value of 1.

Within this matrix, we identified widely known students as those students who were nominated as being high status by many other students (i.e., high indegree in the status matrix; see Wasserman & Faust, 1994), and whose status matrix associates did not have many status connections to one another (i.e., low local clustering coefficient in the status matrix; Wasserman & Faust, 1994). This metric verifies that widely known students serve as social referents for a wide swath of students at the school, rather than for a smaller, interconnected group of students. We identify clique leaders as those students who received many friendship nominations (high indegree in the friendship matrix), and whose connections also shared friendship connections to each other (high local clustering coefficient). This designation of clique leaders indicates that they served as leaders of tightly interconnected groups in the school. This strategy for identifying social referents is superior to one in which students nominate people who they believe to be “widely known” or “clique leaders,” because individuals have different thresholds for who should be included in such designations, rendering their nominations less broadly comparable (Marsden, 2005).

We stratified this pool of widely known students and clique leader students by gender and grade. To improve our ability to detect the distinct influence effects of each type of student on their friendship connections, we excluded from the pool five students of each type who had direct ties to a student of the other type, for example, a clique leader who was directly tied by friendship to a widely known student. We are unable to ensure that the two types of students remain unconnected over the course of the school year, but this does not trouble our overall analytic strategy, which is to measure the effect of the total number of ties to intervention social referents relative to the total number of ties to control social referents.

The term social referent does not indicate a static student trait, but rather a dynamic social status. Students can lose social referent status by losing friendship and status ties to other students over time, or become social referents by gaining ties. For the purposes of studying the influence of the social referents who were randomly assigned to participate in the intervention program, our primary concern was whether the interactions of intervention social referents would change to a significantly different degree than those of control social referent students. We find that they did not; Table 4A (Appendix) illustrates that, as a group, the intervention and control students maintained their social referent status over the course of the year.

Random assignment of social referents to intervention. The final pool contained 83 eligible social referent students: 42 widely known students and 41 clique leaders. We stratified the pool by type of student and by grade level, and used a random number to select 30 students, 15 of each type, to participate in the intervention program. Six of these students refused participation in the program (we address the modeling complications of noncompliance below), leaving 24 social referent students who participated in the intervention (13 widely known students and 11 clique leaders; 16 girls and eight boys; eight sophomores, eight juniors, and eight seniors), and 53 control social referent students who did not participate in the intervention program (27 widely known student alternates and 26 clique leader alternates; 31 girls and 22 boys; 19 sophomores, 11 juniors, and 23 seniors). Below, when we refer to *control social referents*, we mean those social referent students who were not randomly selected for the program; by *intervention social referents*, we mean social referent students who were randomly assigned to participate in the intervention program from the pool of eligible social referents.

Intervention

The NAMES assembly program functions as a platform to broadcast certain students' experiences with and reactions to harassment to the student body, and to facilitate public discussion about harassment among students. During the schoolwide assembly conducted in October, the intervention social referents described their own harassment experiences and invited other students to do the same.

Intervention social referents first participated in two training sessions to prepare for the assembly. A facilitator from the ADL led activities that prompted reflection on the nature and effects of harassment at their school. Students were asked to identify the various roles that students can play in harassment (e.g., an "ally" to targeted students or a "bystander" to events). Intervention social referents discussed and wrote essays about their own experiences of harassment in these various roles. Teachers from the school, in consultation with ADL facilitators, selected five of these essays to be read by the student authors at the assembly. The essays were selected to represent the perspective of students who had been both targets and perpetrators. The other intervention social referents wrote and performed a skit illustrating common types of harassment at the school and ways to speak out against it.

On the day of the assembly, the intervention social referents performed the skit, in which they acted out a rumor spreading to other students about a girl being a "slut." Both girls and boys pass on the rumor, the girl is publically defamed with the word slut in

the school hallway, boys make advances on the girl, and the audience observes the girl's emotional turmoil. In the concluding scene, another girl defends the girl who has been targeted. After the skit, five of the intervention social referents, three girls and two boys, read their essays on stage. One girl's essay described the experience of switching elementary schools because a girl had mobilized her group of friends to continuously harass her, whereas another girl spoke of her own insecurities that lead her to make fun of other students. One of the boys related a story about getting in a physical fight at school, which perpetuated an ongoing cycle of aggression. In between the intervention social referents' performances, an ADL representative spoke about the concepts of bystander, ally, and perpetrator, and the effects of harassment.

At the end of the assembly, there was an open microphone session in which any student could share his or her own experiences with harassment. Twenty-four students from the audience volunteered to speak at the microphone. Many echoed the intervention social referents' call for tolerance and a stop to the "drama." Over half the students who spoke were not socially connected to the intervention social referents, according to the first social network survey, indicating that the group of speakers represented diverse positions in the school social network. After the assembly, all students at the school were divided into small groups to discuss the assembly. Intervention social referents and adult supervisors facilitated these small-group sessions.

A number of follow-up events during the school year reinforced this association between the intervention social referents and anti-harassment messages. Intervention social referents read announcements regarding the consequences of harassment over the loudspeaker during morning announcements for several weeks, and designated a special "NAMES" table at lunch period two times during the year where they sat to eat and chat with any passersby about ways to report harassment or concerns about harassment. Intervention social referents also created a series of magenta-colored posters that each featured a different photo of intervention social referents wearing their NAMES t-shirts, and one of several anti-harassment slogans such as "Whatever your story, I'll listen" and "People who spread rumors are no friends of mine." The slogans were designed to communicate the descriptive idea that intervention social referents behaved in a tolerant manner and the prescriptive idea that they would sanction harassment behavior. Finally, during the spring, intervention social referents sold wristbands for \$1 featuring an anti-harassment message they had selected ("Don't stand by, be an ally").

Behavioral Outcome Measures

Behavior reported by teachers. Before the start of the NAMES program and at the end of the year, we administered a survey to all teachers at the school and to administrative staff who worked closely with students. Teachers and administrators used the school roster to nominate students who they perceived as popular, respected by fellow students, and harassed by other students. They also nominated students who defended those who were harassed, and students who "contributed to a negative school environment." Students received 1 point in each of these categories for each nomination from a teacher or an administrator.

Disciplinary records. We obtained the complete school records of all disciplinary events receiving administrative attention

throughout the school year. The disciplinary data included instances of peer conflict and harassment. Despite reports of widespread harassment, official records of these incidents are rarely coded as harassment specifically (only seven out of 403 infractions). School records of “disruptive” behavior reveal that 14 of the 31 disciplinary incidents involved peers, such as displaying “verbal aggression toward peer, posturing to fight,” or “instigating a fight.” Thus, we add these specific incidents to the harassment code and create a dichotomous variable indicating whether each student was disciplined for peer harassment at school. The dichotomous variable reflects the fact that only three students were recorded more than once for a harassment incident. To test whether the intervention had an effect on poor behavior more generally, we also combined all reported disciplinary events for each student into a count variable.

Wristband purchases. Although the wristbands only cost \$1, we viewed them as a relatively more costly and more public indicator of support for the anti-harassment message, compared with survey responses. We gathered purchase receipts to record which students bought the wristbands.

Results

Analytic Approach

We tested the effects of the randomly assigned intervention social referents on the rest of the students in the school, using linear fixed effects regressions. We measured the effect of social network ties to intervention social referent students (time spent together in the last week), accounting for their ties to control social referent students, on students’ perceptions of collective norms, their beliefs, and their behavior.

As Table 1 indicates, there are many students in the sample who are directly exposed to both intervention and control social referents because they spend time with both. Indeed, some control social referents themselves are directly exposed to intervention social referents. Random assignment within a social network does not create isolated treatment and control groups; rather, random assignment creates different degrees of exposure to intervention social referents depending on the structure of social interactions within the network. Thus, we identified the frequency of social interactions using spend time ties in order to causally relate the dosage of exposure to intervention social referents from zero to n number of ties, and perceptions of norms or anti-harassment behavior.

In our regressions, we examined the effect of each student’s treatment dosage, measured in terms of the number of the student’s

direct ties to randomly assigned intervention social referents, controlling for the student’s total number of ties. We only used ties that originated from each student, that is, their own nominations of the students they spent time with (in social network terms, their outdegree). A fixed effects regression based on each individual’s total number of ties to both intervention and control social referents controls for heterogeneous assignment probabilities induced by the fact that treatment was randomized over a network (see Aronow & Samii, 2012). Specifically, our fixed effects regression includes six dummy variables that index for each individual whether their total number of ties to intervention and control social referents at Wave 1 was zero, one, two, three, four, five, or six (we included a few outliers with more than six total ties in the dummy code for six ties, which did not change our results). The dummy variables of a fixed effects regression analysis account for each individual’s baseline levels of exposure to intervention and control students, and thus their probability of being treated within the network, because the probability of being treated is not equal for every individual. This approach is an appropriate estimation technique if there is an underlying linear relationship between exposure and outcomes (Angrist, 1998; Angrist & Pischke, 2008), and it reflects our hypothesis that greater exposure to social referents who model anti-harassment behaviors should result in greater shifts toward anti-harassment norms and behavior.

Finally, we used an instrumental variable approach to correct for the selection bias that was introduced when six students refused the invitation to participate in the intervention. This instrumental variable analysis examines the influence of the randomly assigned group of intervention social referent students, instead of the influence of the group consisting of the social referents who accepted the invitation to participate. Technically, an instrumental variable analysis rescales the effect size by the rate of compliance with the random assignment (here, the proportion of students—24 of 30—who agreed to participate in NAMES). By preserving random assignment in the analysis, we lose power to the extent that untreated students are included in the treatment condition, but we avoid the possibility of bias resulting from whatever factors led some students to agree to and others to refuse participation in the treatment. Thus, instrumental variable analysis is a conservative approach (see Gelman & Hill, 2007, p. 215).

The number of any student’s ties to intervention and control social referents changes over time, as students form new ties and drop former ties. To account for changes in interactions over time, our critical predictor of normative influence, we used the number of ties to intervention social referents at the wave in which the outcome measure was collected in our regressions. For example, if we are predicting behavior at Wave 3 or measuring change from

Table 1
Number of Students Spending Time With Intervention and Control Social Referents, Neither, or Both

Variable	Students with ties to intervention social referents, no ties to control	Students with ties to control social referents, no ties to intervention	Students with ties to both intervention and control students	Students with no ties to either intervention or control social referents	n for survey wave
Wave 1	18	63	62	117	260
Wave 2	19	59	100	73	250
Wave 3	13	51	95	61	220

Note. Ties indicate student reports of time spent with the intervention or control student.

Wave 1 to Wave 3, we use the number of ties to intervention social referents as measured at Wave 3. This analysis does not introduce bias, as we found no evidence that the intervention changed tie formation or dissolution differentially for the intervention compared with the control social referents.²

The Effect of Social Interaction Network Ties to Intervention Social Referents

Schoolwide norms. Prior to the intervention, there were no differences in perceptions of prescriptive or descriptive collective norms based on the number of ties to intervention social referents, with one exception. The perception that it is socially undesirable to ignore rumors was correlated with having more ties to intervention social referents ($\beta = 0.58, SE = 0.23, p = .01$). Because we predict that intervention social referents will weaken this perceived norm among their peers, this initial difference biases our future analyses in a conservative direction against inflating our effects. We also controlled for the difference in our analyses. The following regressions examine change scores for each student's perception of norms from the preassembly survey at Wave 1 to the postassembly survey at Wave 2, and then from Wave 2 to Wave 3 at the end of the year.

Prescriptive norms. After the assembly intervention at Wave 2, among students with more ties to intervention social referents, we observed a significant decrease in the perception of a general norm of harassment, namely that students at the school believe it is normal to start drama or any other kind of conflict with other students ($\beta = -0.27, SE = 0.13, p = .04$; see Table 2). We also observed a significant decrease in perceptions of norms regarding harassment as a desirable behavioral strategy. Students with more ties to intervention social referents were more likely at Wave 2 to perceive a collective norm that it is acceptable to step back from conflict and not defend your friends ($\beta = -0.41, SE = 0.17, p = .02$) and that it is normal to mind your own business ($\beta = -0.30, SE = 0.15, p = .05$) compared with their perceptions at Wave 1. There were no changes in perceived norms concerning defense of friends and attempts to stop or ignore harassment.

With respect to collective norms regarding a rationale for harassment, among students with more ties to intervention social referents, we observed an unexpected and a significant decrease in the perception that other students believe that harassment has serious emotional effects ($\beta = -0.41, SE = 0.16, p = .01$). That is, following the assembly, students were more likely to believe that other students were insensitive to the effects of harassment. This may reflect their exposure to student testimonials at the assembly about personal experiences of harassment, which often illustrated perpetrators' insensitivity to the emotional pain of their targets. We did not observe changes in perceptions of whether students believe that some peers deserve to have rumors spread about them.

By the end of the year at Wave 3, there were no further shifts in perceived collective norms, with a few exceptions in the predicted direction. First, reversing the pattern from Wave 1 to Wave 2, students with more ties to intervention social referents from Wave 2 to Wave 3 were more likely, as expected, to perceive that students believe that harassment has serious emotional effects ($\beta = 0.39, SE = 0.20, p = .06$). Second, we observed further

decreases in perceptions of norms regarding harassment as a desirable behavioral strategy, specifically that it is desirable to always defend one's friends in conflict ($\beta = -0.38, SE = 0.20, p = .06$) and that it is undesirable to ignore rumors about oneself ($\beta = -0.65, SE = 0.25, p = .01$).

Descriptive norms. Across the entire year, there was a significant increase in the perceived frequency of harassment behavior (descriptive norms of harassment) among all students at the school. Students reported a 20.5% increase in rumors and a 27% increase in forwarding e-mails across the three waves of the survey; the increase at each wave was significant for most harassment-related behaviors (see Table A1 in the Appendix).

The number of ties to intervention social referents was unrelated to students' perceptions of most descriptive norms from Wave 1 to Wave 2. However, descriptive norms reported at the end of the year suggest that students with more ties to intervention social referents were more sensitive to or aware of the rise in harassment. Compared with Wave 1, at Wave 3 students with more ties to intervention social referents perceived a marginally higher rate of harassment via rumor ($\beta = 0.34, SE = 0.19, p = .08$), and a significantly higher rate of e-mail forwarding, IMs, and texts ($\beta = 0.44, SE = 0.19, p = .02$). At the same time, students with more ties to intervention social referents perceived that more students were ignoring harassment at the end of the year compared with the beginning of the year ($\beta = 0.43, SE = 0.19, p = .02$).

Close friend norms. Students with more ties to intervention social referents at Wave 3 were less likely to report norms supporting harassment among their close friends at Wave 3 ($\beta = -0.35, SE = 0.16, p = .03$). Specifically, they did not perceive that their close friends believe that it is normal to start drama or that conflict is normal ($\beta = -0.48, SE = 0.22, p = .03$), or that it is weird to try to stop conflict at the school ($\beta = -0.21, SE = 0.20, ns$).

Summary: Prescriptive and descriptive norm change. As predicted, among students with more ties to intervention social referent students, we observed significant improvements across the year in their perceptions of prescriptive collective norms regarding harassment. Students with more ties to intervention social referents were less likely to perceive that their peers see conflict as "normal" or consider harassment to be a desirable behavioral strategy. The only inconsistency in the predicted pattern, in which students with more ties to intervention students were less likely to believe that their peers saw the serious emotional effects of harassment, was reversed by the end of the year.

All of these changes in perceived prescriptive norms took place against a backdrop of increasing student-reported incidents of harassment. Students with greater ties to intervention students were significantly more likely to report these incidents at the end of the year relative to the start of the year. These findings are consistent with the idea that the behavior of chronically salient and personally relevant social referents can change individuals' perception of what is typical and acceptable

² Relative to control social referents, the experimental assignment did not affect treatment students' social network ties from the first to the last wave in terms of their indegree, or the number of nominations they received: $\beta = 1.31, SE = 1.2, p = .3$. See also Table 4A in the Appendix.

Table 2

Perceptions of Collective Norms of Harassment Decrease Significantly Among Students With More Ties to Intervention Social Referents

Variable	Collective norms: The number of students at this school who believe . . .							Close friend norms
	It is normal to start drama	It's weird to not defend friends	It's normal to mind your own business	People are seriously affected by harassment	People are seriously affected by harassment	It is impt. to defend friends	It is weird to ignore rumors about self	Combined close friend norms:
	Waves 1–2	Waves 1–2	Waves 1–2	Waves 1–2	Waves 2–3	Waves 2–3	Waves 2–3	Wave 3
Ties to intervention social referents	–0.27* (0.13)	–0.41* (0.17)	–0.30 [‡] (0.15)	–0.41* (0.16)	0.39 [‡] (0.20)	–0.38 [‡] (0.20)	–0.65* (0.25)	–0.35* (0.16)
Total number ties	0.01 (0.02)	0.05 [‡] (0.03)	0.03 (0.02)	0.02 (0.02)	–0.04 [‡] (0.02)	0.05* (0.02)	0.05 [‡] (0.03)	0.03 (0.02)
Male	0.35 (0.21)	–0.02 (0.28)	0.03 (0.25)	–0.26 (0.26)	0.18 (0.25)	–0.44 [‡] (0.24)	0.31 (0.32)	0.20 (0.20)
Attended last year	–0.23 (0.21)	0.01 (0.28)	0.76* (0.25)	–0.18 (0.25)	0.04 (0.25)	0.00 (0.24)	–0.34 (0.32)	0.19 (0.20)
GPA	0.10 (0.14)	–0.26 (0.18)	–0.16 (0.16)	0.03 (0.16)	–0.34* (0.17)	–0.09 (0.16)	0.21 (0.21)	0.06 (0.14)
Ign. rumors Wave 1							–0.10 (0.11)	
Constant	0.32 (0.41)	0.21 (0.54)	0.33 (0.48)	0.53 (0.48)	0.59 (0.48)	0.02 (0.46)	–0.06 (0.68)	2.52* (0.39)
N	193	185	189	187	174	173	156	184
Adj. R ²	0.060	0.026	0.043	–0.004	0.022	0.022	–0.006	–0.002

Note. Coefficients are regression coefficients. Standard errors are provided in parentheses. Ties to intervention social referents is a count variable of the number of times respondents indicated that they spent time with an intervention student. Total ties is a count variable of the number of times a respondent indicated that they spent time with any other student at the school. “Male” is a dummy variable (0 = female, 1 = male), as is “Attended last year,” (0 = no, 1 = yes), which captures sophomores and students who attended a different school the previous year. “GPA” is a continuous variable measuring students’ grade-point average from the 2009–2010 school year. The regression includes fixed effects: six dummy variables (not shown) that index for each individual whether their total number of ties to intervention and control social referents at Wave 1 was zero, one, two, three, four, five, or six. Fixed effects account for the fact that individuals in the network have a different probability of exposure to the treatment social referents. impt. = important; Ign. = Ignore.

[‡] $p < .10$. * $p < .05$.

for the social collective. Intervention student referents seem to have drawn other students’ attention to harassment, and changed their perceptions of whether harassment was acceptable in the school. Our next question is whether changes in norms due to interaction with intervention social referents are accompanied by changes in personal beliefs, experiences, and attitudes.

Personal beliefs and experiences. Prior to the intervention, having more ties to intervention social referents was unrelated to students’ personal beliefs about harassment as a problem at school, to their beliefs about the emotional harm of harassment, or to their personal experience of harassment. We did not find any effect of ties to intervention social referents on changes in students’ personal beliefs that harassment is a problem or that students are negatively emotionally affected by harassment.

At each wave, the total sample of students reported a significantly greater belief that gossip and drama was a problem at the school (a 26% increase from Wave 1 to Wave 2, and an 11% increase from Wave 2 to Wave 3; see Table 1A in the Appendix), which reflects the overall pattern of perceived descriptive norms of harassment. Students in general reported significantly more personal problems with harassment at Waves 2 and 3; students with more ties to intervention social referents report marginally fewer personal problems with harassment at Wave 3 compared with Wave 1 ($\beta = -0.25$, $SE = 0.15$, $p = .09$), and significantly fewer problems at Wave 3 compared with Wave 2 ($\beta = -0.33$, $SE = 0.15$, $p = .03$).

Program endorsement and cognitive salience. We found no effect of the intervention social referents on their ties with respect to believing that the NAMES program was important ($\beta = 0.27$,

$SE = 0.22$, ns), or with respect to voting for a similar anti-harassment program the following year ($\beta = 0.20$, $SE = 0.21$, ns). More students tied to intervention social referents correctly remembered slogans from intervention posters hung around the school at Wave 3, though the effect was not significant when demographic controls were added.

Summary: Individual beliefs, experiences, and attitudes. Although social referents influence perceptions of collective norms over the school year, they did not influence students’ personal beliefs about harassment or their attitudes toward the anti-harassment intervention. In terms of how they experience the school environment, students with more ties to intervention social referents were significantly less likely to report personal trouble with harassment. We now turn to the question of whether students’ harassment and anti-harassment behavior is affected along with their perceived collective norms about harassment.

Behavior

Teacher nominations. In April, 6 months after the intervention, teachers were more likely to nominate students with more ties to intervention social referents as students who defend other students from harassment, controlling for preintervention nominations ($\beta = 0.33$, $SE = 0.18$, $p = .06$; see Table 3). Teachers were significantly less likely to nominate students with more ties to intervention social referents as students who contribute to a negative school environment ($\beta = -0.88$, $SE = 0.36$, $p = .02$), controlling for preintervention nominations.

Disciplinary actions. According to year-long school disciplinary records, students with more ties to intervention social

Table 3
Behavioral Change Among Individuals With More Ties to Intervention Social Referents

Variable	Teacher nominations		School disciplinary action		Public behavior
	Defends others: Wave 3	Contributes to negative environment: Wave 3	All action: Wave 3	Harassment related: Wave 3	Purchased wristband: Wave 3
Ties to intervention social referents	0.33 [‡] (0.18)	-0.89* (0.36)	-1.20* (0.60)	-0.69 [‡] (0.36)	0.50* (0.18)
Total number ties	-0.01 (0.02)	0.07 [‡] (0.04)	0.10 (0.07)	0.05 (0.04)	-0.02 (0.02)
Male	-0.35 [‡] (0.20)	1.45* (0.40)	2.19* (0.67)	0.74* (0.33)	0.11 (0.25)
Attended last year	-0.01 (0.21)	-0.07 (0.42)	-0.07 (0.67)	0.05 (0.32)	-0.36 (0.25)
GPA	0.31* (0.13)	-0.82* (0.28)	-2.29* (0.44)	-0.54* (0.26)	0.07 (0.16)
Wave 1 Teacher nomination	0.78* (0.12)	1.01* (0.25)			
Constant	-0.13 (0.38)	2.51* (0.81)	7.94* (1.29)	-1.12 [‡] (0.64)	-1.55* (0.49)
<i>N</i>	227	227	227	209	227
Adj. <i>R</i> ²	0.312	0.208	0.195		
Log likelihood				-83.63	-144.11

Note. Coefficients are regression coefficients, except for harassment-specific disciplinary behaviors and wristband purchases, which are reported as log odds. Standard errors are provided in parentheses. Ties to intervention social referents is a count variable of the number of times respondents indicated that they spent time with an intervention student. Total ties is a count variable of the number of times a respondent indicated that they spent time with any other student at the school. "Male" is a dummy variable (0 = female, 1 = male), as is "Attended last year," (0 = no, 1 = yes), which captures sophomores and other students who attended a different school the previous year. "GPA" is a continuous variable measuring student grade-point average from the 2009–2010 school year. The regression includes fixed effects: six dummy variables (not shown) that index for each individual whether their total number of ties to intervention and control social referents at Wave 1 was zero, one, two, three, four, five, or six. Fixed effects account for the fact that individuals in the network have a different probability of exposure to the treatment social referents.

[‡] $p < .10$. * $p < .05$.

referents at Wave 3 were marginally less likely to be cited for harassment-related disciplinary infractions ($OR = 0.50$, $SE = 0.36$, $p = .06$), and for all disciplinary infractions generally ($\beta = .30$, $SE = 0.60$, $p = .05$). Disciplinary action taken by the school correlated strongly with springtime teacher nominations of students who "create a negative school environment" ($r = .42$, $p < .001$, for harassment-related disciplinary infractions, and $r = .74$, $p < .001$, for all disciplinary infractions). Neither type of disciplinary infraction correlated with teacher nominations from the beginning of the year ($r = .01$ and $r = .05$, respectively).

Wristband purchases. Students with more ties to intervention social referents over and above ties to control at Wave 3 purchased significantly more wristbands bearing the anti-harassment slogan ($OR = 1.65$, $SE = 0.18$, $p = .01$).

Summary: Behavioral changes. As predicted, significant decreases in harassment behavior and increases in anti-harassment behavior accompanied improvements in perceived prescriptive collective norms about harassment among students with more ties to intervention social referents. This finding holds for teacher nominations across a two-wave survey, for official school disciplinary records, and for directly observed student behavior (see Table 3).

Behavioral Change Among Individuals With More Ties to Intervention Social Referents

Widely known students and clique leaders.

The separate effects of widely known and clique leader students. The above evidence supports our hypothesis that when students think about the collective social norms of a school, they heavily weight the perceived actions of widely known and clique leader students who serve as social referents. The effect of these social referents is stronger to the extent that students choose to socially interact with them across situations

within the collective, which is captured in our analyses by their measured number of ties to the intervention social referents in the school social network.

We also predicted that the two types of social referents might be particularly effective along different dimensions, given their pattern of social ties. Specifically, given the widespread social ties and relatively high social status of widely known students, they might be particularly effective at influencing others' perceptions of collective norms. Likewise, clique leaders might be particularly effective at influencing norms of local subgroups and behavior that is particularly socially risky, given that they are more able to sanction or support peers who belong to their more intimate, closed subgroups.

In this section, we decompose our main findings to separately test the effects of widely known and clique leader intervention social referents. We ran analyses similar to those reported above, including separate variables for the number of ties to widely known intervention social referents and to clique leader intervention social referents. Where the effects of widely known and clique leader students are significantly different in size, we report the contrast using postestimation Wald tests.

Collective and close friend norms. Contrary to our predictions, widely known and clique leader students were similarly effective at communicating collective school norms to the students tied to them (see Table 4). Students with ties to widely known and clique leader treatment students were more likely to perceive that students at the school believe it is okay to step back from conflict by not defending friends, and there are negative emotional effects of harassment. A few differences emerged from Wave 1 to Wave 2; only ties to clique leader students predicted a lower likelihood of perceiving that it was normal to start drama at the school ($\beta = -.49$, $SE = .20$, $p = .01$), and only ties to widely known students predicted a lower likelihood of perceiving that it is normal to mind

Table 4
Clique Leaders and Widely Known Students Influence Different Behaviors

Variable	Collective norms: The number of students at this school who believe . . .			Close friend norms Wave 3	Personal beliefs	Behavior		
	It's normal to start drama	It's normal to mind own business	People are seriously affected by harassment		Problems w/harassment	Teacher nom: defends others	Teacher nom: respected	Purchase wrist-band
	Wave 1–2	Wave 1–2	Wave 2–3		Wave 2–3	Wave 3	Wave 3	Wave 3
Ties to intervent. clique leaders	-0.49* (0.20)	-0.20 (0.23)	0.20 (0.26)	-0.57* (0.21)	-0.24 (0.20)	0.73* (0.22)	0.67* (0.21)	0.42 [‡] (0.25)
Ties to intervent. widely knowns	-0.97 (0.15)	-0.33* (0.17)	0.41* (0.18)	-0.16 (0.15)	-0.33* (0.14)	0.05 (0.16)	-0.09 (0.15)	0.44* (0.18)
Total number ties	0.01 (0.02)	0.03 (0.02)	-0.04 [‡] (0.02)	0.03 (0.02)	0.05* (0.02)	-0.01 (0.02)	-0.02 (0.02)	-0.23 (0.02)
Male	0.40 [‡] (0.21)	0.05 (0.25)	0.19 (0.25)	0.29 (0.20)	0.24 (0.19)	-0.45* (0.20)	-0.25 (0.19)	0.08 (0.25)
Attended last year	-0.18 (0.21)	0.72* (0.25)	0.03 (0.25)	0.26 (0.20)	-0.19 (0.19)	-0.10 (0.21)	-0.32 (0.20)	-0.39 (0.26)
GPA	0.14 (0.14)	-0.17 (0.16)	-0.33 [‡] (0.17)	0.08 (0.14)	-0.09 (0.12)	0.28* (0.13)	0.48* (0.13)	0.08 (0.16)
Wave 1 Teacher nomination						0.81* (0.12)	1.05* (0.09)	
Constant	0.19 (0.41)	0.35 (0.48)	0.53 (0.48)	2.40* (0.40)	0.05 (0.36)	0.04 (0.38)	-0.24 (0.38)	-1.55* (0.50)
N	193	189	174	184	170	227	227	227
Adj. R ²	0.064	0.051	0.033	-0.007	0.012	0.333	0.536	
Log likelihood								-75.68

Note. Coefficients are regression coefficients, except for wristband purchases, which are reported as log odds. Standard errors are provided in parentheses. Ties to intervention social referents is a count variable of the number of times respondents indicated that they spent time with an intervention student. "Male" is a dummy variable (0 = female, 1 = male), as is "Attended last year," (0 = no, 1 = yes). GPA is a continuous variable measuring student grade-point average from the 2009–2010 school year. The regression includes fixed effects: six dummy variables (not shown) that index for each individual whether their total number of ties to intervention and control social referents at Wave 1 was zero, one, two, three, four, five, or six. Fixed effects account for the fact that individuals in the network have a different probability of exposure to the treatment social referents. nom = nomination; intervent. = intervention; Adj. = adjusted.

[‡] $p < .10$. * $p < .05$.

your own business in the face of harassment ($\beta = -.33$, $SE = 0.17$, $p = .05$).

Clique leaders and widely known students influence similar and different behaviors. From Wave 2 to Wave 3, students with more ties to both widely known and to clique leader intervention social referents were more likely to perceive a norm at the school that ignoring harassment was desirable. More ties to widely known intervention social referents predicted a significant increase in students' perception that other students believe that harassment can have serious emotional effects ($\beta = 0.40$, $SE = .18$, $p = .02$).

Supporting our predictions for the influence of clique leaders over close friend norms, we found that students with more ties to clique leader intervention social referents were significantly less likely to perceive pro-harassment norms among their *close* friends ($\beta = -0.57$, $SE = .20$, $p = .001$). The perception of close friends' harassment norms did not change among students with more ties to widely known intervention social referents. The difference between the effect of clique leader and widely known intervention social referents was significant, $F(1, 171) = 3.92$, $p = .05$.

Personal beliefs and experiences. We did not find any significant effect of ties to widely known or to clique leader intervention social referents on personal beliefs about harassment. Ties to widely known intervention social referents predicted a significant decrease in reported personal problems with harassment from Wave 2 to Wave 3 ($\beta = -0.32$, $SE = .14$, $p = .02$).

Behavior. For some behaviors, ties to both widely known and to clique leader intervention social referents affected students' harassment behaviors. Specifically, students with more ties to widely known and to clique leader intervention social referents

commit marginally fewer harassment-related disciplinary infractions and are less likely to be nominated by teachers for contributing to a negative school environment.

For other behaviors, widely known and clique leader intervention students are differentially influential. Students with more ties to clique leader intervention social referents were more likely to be nominated by teachers as defending other students from harassment ($\beta = 0.73$, $SE = .22$, $p = .001$). This effect did not hold for ties to widely known intervention social referents, and the difference between the effect of ties to clique leaders and of ties to widely known intervention social referents is significant, $F(1, 124) = 5.60$, $p = .01$. Students with more ties to widely known intervention social referents were significantly more likely to purchase wristbands ($OR = 1.56$, $SE = .17$, $p = .01$); students with more ties to clique leader intervention social referents also purchased more wristbands, but not to a significant extent (see Table 4).³

Summary: The effects of widely known and clique leader social referents. Both widely known and clique leader intervention students in our experiment influenced perceptions of collective norms, which suggests that social referents do not need to be widely connected across network subgroups to influence percep-

³ Interestingly, students with more ties to intervention clique leaders are also nominated significantly more often by teachers as respected ($\beta = 0.67$, $SE = .21$, $p = .002$), a significant contrast to the effect of widely known students, $F(1, 214) = 10.7$, which suggests that association with students in the intervention may have conferred more social status on clique leaders and their friends, at least as assessed by teachers.

tions of the collective. As expected, clique leaders significantly influenced perceptions of close friends' norms to a significantly greater degree than widely known intervention referents. Neither type of social referent influenced personal beliefs about harassment to a significant extent. Ties to both types of intervention students led to fewer harassment behaviors in school; however, the two types of social referents differentially affected anti-harassment behavior. Students with more ties to clique leaders were significantly more likely than students with ties to widely known students to defend peers against harassment, which could reflect the clique leaders' ability to encourage more socially risky behavior within their closed, smaller friendship circles. Students with greater ties to widely known intervention referents were significantly more likely to purchase anti-harassment wristbands.

Mechanism of Influence: The Personal Salience of Social Referents

We have tested the claim that social referents' influence passes through everyday social interaction, interaction that occurs relatively frequently and is driven by students' personal motivation to spend time with the social referent. We propose that both dimensions of interaction, the frequency and the personal motivation, are important mechanisms by which social referents influence their peers' perceptions of collective norms.

Given this, personally initiated social interactions, as measured by the spending time together ties, should be more important to changing perceptions of collective norms than interactions created by relatively arbitrary institutional channels. We tested this aspect of our hypothesis by comparing the effect of exposure to intervention social referents on the basis of personally initiated interactions to the effect of exposure on the basis of shared classes. Shared classrooms are arbitrarily, though not randomly, assigned at the school. Interaction captured by spend time ties is more personally meaningful for students; students who reported choosing to spend time with intervention social referents were significantly more likely to report being friends with intervention social referents in Survey Waves 2 and 3 ($r = .21, p < .001$; $r = .27, p < .001$, respectively). By contrast, students who were exposed to intervention social referents via shared classes were not significantly more likely to report being friends with intervention social referents at Waves 2 and 3 ($r = .04, ns$; $r = -.1, ns$, respectively).

Intervention social referents may influence some types of behaviors through interactions based on shared classes, in particular bandwagon behaviors that are encouraged and exacerbated by the presence of peers. Harassment in a classroom is often a bandwagon behavior, to the extent that it is encouraged by the captive audience of students in the class who can join in or comment. However, sharing a class with an intervention social referent should not influence perceptions of collective norms, or behaviors that require more individual initiative or social risk, because classroom exposure to an intervention social referent does not represent the same kind of personal relevance as do the interactions that were chosen by students.

To test our proposed mechanism of personally initiated interactions, we used the number of classroom exposures to intervention social referents to estimate whether more frequent exposure to intervention social referents shifts students' perceptions of norms, their personal experiences and beliefs, and their behavior. Students

had between three and 117 classroom exposures to, or shared class periods with, intervention and control social referents over the course of the school year. We counted the total number of intervention and control social referents who share a class with each student in the fall or spring semesters. As in the above analyses, we used an instrumental variable regression and control for the number of overall classroom exposures to control social referents, the total number of social ties, and background variables (gender, previous year attendance at the school, and grade-point average). The effects of classroom exposure to intervention social referents are the same with and without controls for students' number of spend time ties to intervention social referents.

Influence from exposure to intervention social referents in classrooms.

Schoolwide norms. Consistent with our expectations, we do not observe effects of having more intervention social referents in class on prescriptive or descriptive norms. Two exceptions were (a) a significant decrease in the perception among students sharing more classes with intervention social referents that students at the school believe others deserve to have rumors spread about (from Wave 1 to Wave 3; $\beta = -0.11, SE = 0.04, p = .01$; the difference between Waves 2 and 3 was significant as well) and (b) a significant decrease from Wave 2 to Wave 3 in the perception that students ignore other students who gossip behind their backs ($\beta = -0.07, SE = 0.03, p = .05$). Unexpectedly, students who shared more classes with intervention social referents in the second semester of the year were also marginally less likely to report that their *close friends* believed starting drama or conflict to be normal ($\beta = -0.08, SE = 0.05, p = .09$) and that their close friends believed it was wrong to stop students from starting drama ($\beta = -0.07, SE = 0.04, p = .06$).

Behavior. We found that exposure to intervention social referents in the classroom does predict bandwagon harassment behavior that is likely encouraged and exacerbated by the participation of peers. At the end of the school year, teachers were less likely to nominate students who shared more classes with intervention social referents as creating a negative school environment ($\beta = -0.21, SE = 0.07, p = .006$), and marginally less likely to be harassed by others ($\beta = -0.04, SE = 0.02, p = .07$), controlling for teacher nominations at the beginning of the year.

Students with more classroom exposure to intervention social referents at Wave 3 were also significantly less likely to be cited for any disciplinary infraction ($\beta = -1.52, SE = 0.54, p = .006$) or for disciplinary infractions for harassment-related behavior ($OR = 0.99, SE = 0.005, p = .015$), according to the school's official disciplinary records.

Other behaviors, arguably those that require more individual initiative or social risk, were not significantly affected by classroom exposure. Specifically, students who shared more classes with intervention social referents were less likely to be nominated by teachers as defending other students ($\beta = -0.07, SE = 0.04, p = .08$) and did not have significantly higher odds of buying a wristband ($OR = 1.04, SE = 0.04, p = .35$).

Summary: Personal salience as a mechanism of social referent influence. We found that in some ways, social referents can influence other students simply by being in their classrooms. Students with more exposure to intervention social referents through classroom assignment were disciplined less often for harassment behaviors; however, they were not more likely to act against harassment, either

through actions requiring individual initiative (i.e., buying a wristband) or social risk (i.e., defending another student from harassment). We found little evidence that classroom exposure to intervention social referents influenced perceptions of collective norms related to harassment, though they did seem to influence perceptions of the harassment norms of students' close friends, a finding we did not expect. Contrasted to the broad and significant influence of intervention social referents on the students who chose to interact with them, we conclude that the strength of personally motivated interaction is a critical mechanism of influence, along with chronic salience, on collective social norms and behavior.

Discussion

Recent theory and empirical research has suggested that the problem of widespread and cyclical harassment in schools, often described as a "culture of harassment," is driven by students' perceptions of a schoolwide social consensus, or collective norms supporting harassment. These norms describe the typicality and desirability of behavioral strategies and beliefs that escalate or condone harassment. From this perspective, the best strategy for interrupting the pattern of harassment behavior is not to address students' personal values or beliefs, but to alter their perceptions of these collective norms.

Theories of social norms suggest that certain members of a social group play a disproportionate role in reinforcing and in potentially shifting the norms of the entire group. Social norms theory and situational theories of norm perception point to people who are highly connected, such that their behavior is marked as important to those who are connected to them, and who are chronically salient, such that their behavior is frequently present over time to reinforce perceptions of what is typical or desirable across situations. We hypothesized that their influence is passed through everyday social interaction that is personally motivated and frequent.

Using, to our knowledge, the first randomized experiment to assign individuals to treatment based on their position in a community's complete social network, our results show that social referents did significantly change their peers' perception of the collective school norm that harassment was typical. Following the social referents' public displays against harassment in a schoolwide assembly program, this norm, and others addressing behavioral strategies and rationales for peer conflict and harassment, changed from the beginning of the school year to just after the assembly. For the rest of the school year, a few other prescriptive norms supporting harassment significantly changed in a prosocial direction, all among students who initiated frequent interaction with the social referents relative to students who had fewer personally motivated interactions with social referents.

This finding extends the initial insights of social norm theory, which posited that reference group leaders are able to define the norm for their subgroup (Sherif & Sherif, 1964). The intervention-referent students affected the perceived norms of their close friend groups, but it is notable that they were also able to change perceptions of what was typical and desirable for the whole community. For the widely known social referent students, this may be because of their relatively high status in the school social network along with their wide-reaching ties to many students, which suggests to other students that they represent the larger school identity. More impressive is that the clique leader reference students were also able to affect perceptions of collective norms. We speculate that this may result from their greater

ability to monitor and sanction clique members and thus achieve more uniform behavior. Uniform behavior within the clique may lead to a biased view of the rest of the collective.

Important behavioral changes accompanied the shifted perception of prescriptive norms supporting harassment. Specifically, teachers were significantly more likely to nominate students with more interaction ties to intervention reference students as students who defend other students from harassment and who do not contribute to a negative environment. Among students with more ties to intervention social referents, we also found fewer disciplinary infractions involving harassment or poor behavior more generally, and significantly more purchases of wristbands, which were meant as public displays of support for anti-harassment behavior. Our finding that prescriptive but not descriptive norms accompanied these behavioral changes is anticipated by research on normative influence from other contexts (e.g., Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

These behavioral results also suggest the important influence of perceived norms on patterns of conflict behavior that has been reported by previous research (e.g., Paluck, 2009). Consistent with this literature, we note no changes in personal beliefs about harassment accompanying this shifted behavior. Although their importance is increasingly recognized in the intergroup relations literature, the concept of collective norms could be fruitfully applied to models of relational aggression, gossip, and *intragroup* conflict (e.g., Archer & Coyne, 2005; Foster, 2004).

The fact that no personal beliefs about harassment were affected and that students' reactions to the intervention were not associated with their interaction ties to the intervention social referent students suggest that students' self-reports were unaffected by a desire to please the investigators. The possibility that our results were driven by demand are in general unlikely; students who had guessed our hypotheses would have had to scale their answers according to the number of intervention and control social referents with whom they reported spending time, because our analyses were conducted according to exposure dosage. Teachers are also unlikely to have responded to demand; although they knew which social referents had participated in the intervention, to give answers consistent with our expectations, they would have had to know which students reported spending time with the intervention social referents in each social network survey. Finally, demand is unlikely to explain the consistent *pattern* of results across three sources: students, teachers, and school administrative records.

Mechanism of Influence: Everyday Social Interaction

Our primary claim was that social referent students are able to affect student norm perceptions because of their psychological salience, due to personal connections to social referents and the frequency of the everyday interactions with social referents' behavior. As one student noted, students he considered to be influential would sit in a central area of the hallway on sofas in between classes, where "kids can see" and where "a whole bunch of kids will start coming, gathering" to talk to them (Student DE, personal communication, June 2011). Supporting this mechanism of influence, we found that chronic exposure that is not driven by personal motives, but rather by institutional scheduling (shared classes), exerts less influence over students' perceptions of collective norms. Institutionally determined interactions do shape behaviors

that require or are facilitated by group coordination, including important outcomes like harassment behaviors and behaviors that contribute to a negative environment. Thus, behaviors that require the encouragement or the response of peers may in fact be changed by mere exposure to social referent students who have publically changed their actions (at the assembly and at visible follow-up events through the year). However, we found that exposure through institutional channels affects inferences about collective norms to a much lesser degree. This suggests that personal relevance in addition to frequent exposure is essential for influence over collective norms and over behavior that is more socially risky, such as defending others when they are targets of harassment. Interestingly, perceptions of close friend norms are affected by classroom exposure to the intervention social referent students, suggesting that the personal relevance of social referents is essential to identifying schoolwide, collective norms, but not necessarily the norms of small groups.

Different Types of Social Referents for Collective Normative and Behavioral Change

Another aspect of this research examined the influence of different types of social referents, and unexpectedly, we found that both clique leaders and widely known referents effectively change collective norms and harassment behavior. We also found some divergent effects, which might result from the widely known social referents' relatively greater status in the network, and from the relatively greater personal influence of clique leaders. Specifically, clique leaders were significantly better at affecting close friend norms, whereas widely known social referents were significantly better able to reduce the personal problems with harassment experienced by the students with ties to them, in addition to being significantly better at convincing these students to buy the intervention wristband.

Although both types of social referents successfully influenced perceptions of collective harassment norms, it is reasonable to wonder whether their influence would be equally significant over norms describing different types of behaviors, such as fashion or academic behaviors. The relative influence of the two types of social referents might diverge more in other behavioral domains. For example, fashion aesthetics are often dominant within smaller subgroups in which an identity and accompanying behavioral norms are defined in a way to distinguish the small group from the general community. Thus, we expect that for behaviors that are more immediately relevant to personal identity, clique leaders, many of whose groups have identities that differ from the wider community, may be particularly disadvantaged in influencing perceptions of collective norms. This hypothesis and related hypotheses about the behavior of subgroups and of sanctioning and conformity within groups point to still-uncharted territory in the social sciences that could be usefully explored with social network experiments.

Norms and Changing School Climate

A notable result is that over the course of the study, descriptive norms of harassment increased across the year for the entire sample. (In the absence of a no-treatment counterfactual, it is of course impossible to know whether descriptive norms would have

increased more or less without the presence of the program.) Students with more ties to intervention social referents noticed and reported this rise to a greater extent. This might be because they spoke about harassment more often with their interaction partners (the intervention social referents), because the intervention referents made their interaction partners more aware of harassment during the assembly, or because students' perceptions of norms had shifted to consider harassment more deviant. Increasing consideration of harassment as deviance would make instances of harassment more notable and salient, leading to increased reporting of those instances.

More generally, it is tempting to infer from the within-school rise in reports of harassment that the intervention did not effectively change the overall pattern or diminish the level of harassment at the school. Do changes in the perceived norms among students with ties to intervention social referents reflect that the intervention affected the overall school climate? Without a counterfactual in which social referent students were not assigned to the intervention, we cannot know whether the intervention had an impact on general levels of harassment. There is reason to believe, however, that the momentum of the anti-harassment assembly was not maintained over the course of the year, during which the intervention social referent students participated in a few follow-up activities. As a possible reflection of the intervention's lack of strong presence following the assembly, students reported significantly higher confidence in the possibility of change of harassment patterns right after the assembly ($\beta = 0.24$, $SE = 0.10$, $p = .01$), but no change in confidence from that point until the rest of the year ($\beta = 0.03$, $SE = 0.13$, ns).

In the present study, we were able to test whether referent students could change their peers' perceptions of norms addressing the entire school, based on their everyday interactions with those peers. The finding indicates which people to target in order to influence the norms and patterns of behavior in a community, but it does not address overall community change of the type indicated in the phrase "culture of harassment." To shift an entire school's normative climate and pattern of behavior, more social referents may need to demonstrate behavioral changes such as those prompted by the intervention program. A future research strategy would be to compare schools with varying proportions of all social referent students assigned to the intervention.

Beyond a better understanding of whom to target in a collective, this research fills a noticeable gap in understanding how people infer norms over the course of everyday life, as opposed to reacting to presentations of normative information. Studies that present normative information in the form of descriptive statistical summaries (e.g., 90% of all students at this college report tolerance toward minorities; Stangor, Sechrist, & Jost, 2001) imply that social norms are static and will be understood by group members as a relatively stable social fact. In a new direction from past work, our findings reveal the nature of perceived collective norms: They depend on patterns of and motivations for interactions within groups across time, and they are not static but are constantly renegotiated and reproduced through social interactions. Understanding this process creates opportunities for collective normative and behavioral change.

References

- Angrist, J. (1998). Using social security data on military applicants to estimate the effect of military service earnings. *Econometrica*, *66*, 249–288. doi:10.2307/2998558
- Angrist, J. D., & Pischke, J. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton, NJ: Princeton University Press.
- Archer, J., & Coyne, S. (2005). An integrated review of indirect, relational, and social aggression. *Personality and Social Psychology Review*, *9*, 212–230. doi:10.1207/s15327957pspr0903_2
- Aronow, P., & Samii, C. (2012). *Estimating average causal effects under general interference* [Working paper]. Retrieved from <http://www.biostat.jhsph.edu/~estuart/Aronow-acic-paper.pdf>
- Asch, S. E. (1955). Opinions and social pressure. *Scientific American*, *193*, 31–35. doi:10.1038/scientificamerican1155-31
- Bearman, P., & Moody, J. (2004). Suicide and friendships among American adolescents. *American Journal of Public Health*, *94*, 89–95. doi:10.2105/AJPH.94.1.89
- Blanchard, F. A., Crandall, C. S., Brigham, J. C., & Vaughn, L. A. (1994). Condemning and condoning racism: A social context approach to interracial settings. *Journal of Applied Psychology*, *79*, 993–997. doi:10.1037/0021-9010.79.6.993
- Blanton, H., & Burkley, M. (2008). Deviance regulation theory: Applications to adolescent social influence. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 94–121). New York, NY: Guilford Press.
- Blanton, H., & Christie, C. (2003). Deviance regulation: A theory of action and identity. *Review of General Psychology*, *7*, 115–149. doi:10.1037/1089-2680.7.2.115
- Bradshaw, C., & Waasdorp, T. (2009). Measuring and changing a “culture of bullying.” *School Psychology Review*, *38*, 356–361.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*, 591–621. doi:10.1146/annurev.psych.55.090902.142015
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*, 1015–1026. doi:10.1037/0022-3514.58.6.1015
- Coleman, J. S., Katz, E., & Menzel, H. (1957). The diffusion of an innovation among physicians. *Sociometry*, *20*, 253–270. doi:10.2307/2785979
- Faris, R., & Felmlee, D. (2011). Status struggles: Network centrality and gender segregation in same- and cross-gender aggression. *American Sociological Review*, *76*, 48–73. doi:10.1177/0003122410396196
- Foster, E. K. (2004). Research on gossip: Taxonomy, methods, and future directions. *Review of General Psychology*, *8*, 78–99. doi:10.1037/1089-2680.8.2.78
- Gelman, A., & Hill, J. (2007). *Data analysis using regression and multi-level/hierarchical models*. Cambridge, England: Cambridge University Press.
- Graham, S. (2006). Peer victimization in school: Exploring the ethnic context. *Current Directions in Psychological Science*, *15*, 317–321. doi:10.1111/j.1467-8721.2006.00460.x
- Hardin, C. D., & Higgins, E. T. (1996). Shared reality: How social verification makes the subjective objective. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: The interpersonal context* (Vol. 3, pp. 28–84). New York, NY: Guilford Press.
- Hogg, M. (2010). Influence and leadership. In S. T. Fiske, D. Gilbert, & L. Gardner (Eds.), *Handbook of social psychology* (5th ed., pp. 1166–1207). Hoboken, NJ: Wiley.
- Juvonen, J., & Cadigan, J. (2002). Social determinants of public behavior of middle school youth: Perceived peer norms and need to be accepted. In F. Pajares & T. Urdan (Eds.), *Adolescence and education: Vol. 2. Academic motivation of adolescents* (pp. 277–297). Greenwich, CT: Information Age.
- Juvonen, J., & Galván, A. (2008). Peer influence in involuntary social groups: Lessons from research on bullying. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 225–244). New York, NY: 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. doi:10.1177/01461672002610009
- Kitts, J. A. (2003). Egocentric bias or information management? Selective disclosure and the social roots of norm misperception. *Social Psychology Quarterly*, *66*, 222–237. doi:10.2307/1519823
- Marsden, P. (2005). Recent developments in network measurement. In P. J. Carrington, J. Scott, & S. Wasserman (Eds.), *Models and methods in social network analysis* (pp. 8–30). New York, NY: Cambridge University Press. doi:10.1017/CBO9780511811395.002
- Marwick, A. E., & Boyd, D. (2011, September). The drama! Teen conflict, gossip, and bullying in networked publics. In K. Crawford (Chair), *A decade in Internet time: Symposium on the dynamics of the internet and society*. Symposium conducted at the University of Oxford, Oxford, England.
- Mason, W. A., Conrey, F. R., & Smith, E. R. (2007). Situating social influence processes: Dynamic, multidirectional flows of influence within social networks. *Personality and Social Psychology Review*, *11*, 279–300. doi:10.1177/1088868307301032
- Miller, D. T., & Prentice, D. A. (1996). The construction of social norms and standards. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 799–829). New York, NY: Guilford Press.
- 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.
- Pickett, C., Silver, M., & Brewer, M. (2002). The impact of assimilation and differentiation needs on perceived group importance and judgments of ingroup size. *Personality and Social Psychology Bulletin*, *28*, 546–558. doi:10.1177/0146167202287011
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, *64*, 243–256. doi:10.1037/0022-3514.64.2.243
- Schultz, P., Nolan, J., Cialdini, R., Goldstein, N., & Giskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, *18*, 429–434. doi:10.1111/j.1467-9280.2007.01917.x
- Shepherd, H. R. (2012). The structure of perception: How networks shape ideas of norms. Manuscript submitted for publication.
- Sherif, M. (1936). *The psychology of social norms*. New York, NY: Harper.
- Sherif, M., & Sherif, C. (1964). *Reference groups: Exploration into conformity and deviation in adolescents*. Chicago, IL: Henry Regnery Company.
- Stangor, C., Sechrist, G. B., & Jost, J. T. (2001). Changing racial beliefs by providing consensus information. *Personality and Social Psychological Bulletin*, *27*, 486–496. doi:10.1177/0146167201274009
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. Cambridge, England: Cambridge University Press. doi:10.1017/CBO9780511815478
- Zou, X., Tam, K-P., Morris, M. W., Lee, S-L., Lau, I. Y., & Chiu, C.-Y. (2009). Culture as common sense: Perceived consensus versus personal beliefs as mechanisms of cultural influence. *Journal of Personality and Social Psychology*, *97*, 579–597. doi:10.1037/a0016399

(Appendix follows)

Appendix

Table A1
Means and (Standard Deviations) for Outcome Variables Across Waves, All Respondents

Variable	Means			Change in means		
	Wave 1	Wave 2	Wave 3	Waves 1–2	Waves 1–3	Waves 2–3
Collective norms: The number of students at this school who believe . . .						
It's normal to start drama	3.61 (1.53)	3.86 (1.40)	4.12 (1.29)	0.37 (1.47)	0.50 (1.67)	0.28 (1.50)
Students are seriously affected	3.38 (1.32)	3.68 (1.37)	3.57 (1.21)	0.41 (1.62)	0.20 (1.65)	-0.06 (1.55)
Students deserve rumors about them	2.84 (1.47)	2.89 (1.35)	3.21 (1.39)	0.07 (1.62)	0.36 (1.70)	0.34 (1.51)
It's important to defend your friends	4.73 (1.32)	4.68 (1.24)	4.42 (1.31)	-0.05 (1.53)	-0.32 (1.52)	-0.27 (1.45)
I'll be criticized for not defending	3.86 (1.51)	3.61 (1.47)	3.73 (1.44)	-0.25 (1.83)	-0.21 (1.86)	0.08 (1.81)
It's weird if you try to stop conflict	3.06 (1.32)	2.91 (1.28)	2.91 (1.38)	-0.16 (1.58)	-0.16 (1.76)	-0.03 (1.64)
It's weird if you ignore rumors	3.15 (1.43)	3.17 (1.49)	3.19 (1.44)	-0.02 (1.82)	0.06 (1.83)	0 (1.84)
Normal to mind your own business	3.78 (1.39)	3.96 (1.33)	—	0.20 (1.61)	—	—
Descriptive Norms: The number of students at the school who . . .						
Spread rumors	2.48 (1.15)	2.76 (1.04)	2.99 (0.92)	0.08 (0.48)	0.18 (0.54)	0.04 (0.44)
Forward e-mails, IMs, texts	1.99 (1.08)	2.06 (1.06)	2.53 (0.97)	0.03 (0.46)	0.17 (0.54)	0.10 (0.42)
Act as negotiators	1.94 (0.84)	2.18 (0.88)	2.14 (0.80)	0.08 (0.36)	0.06 (0.44)	-0.04 (0.33)
Stand up for someone	2.22 (1.01)	2.40 (0.91)	2.35 (0.90)	0.06 (0.42)	0.03 (0.47)	-0.03 (0.43)
Ignore instigators	2.19 (1.05)	2.37 (0.99)	2.33 (0.92)	0.04 (0.47)	0.02 (0.49)	-0.07 (0.44)
Physically threaten	1.60 (0.87)	1.73 (0.79)	2.12 (0.87)	-0.02 (0.35)	0.13 (0.47)	0.08 (0.33)
Close friend norms: Number of my close friends who believe . . .						
It's wrong to stop drama			2.08 (1.48)			
It's normal to start drama			3.45 (1.69)			
Personal beliefs and experiences						
Too many students gossip	1.91 (0.85)	2.41 (0.92)	2.68 (1.00)	0.54 (0.96)	0.77 (1.16)	0.31 (1.02)
Students are emotionally affected	2.62 (0.96)	2.81 (0.95)	2.64 (0.93)	0.21 (1.06)	0.02 (1.11)	-0.12 (1.05)
Personal problem with gossiping	1.45 (0.83)	1.58 (0.88)	1.69 (0.98)	0.16 (0.92)	0.23 (1.14)	0.11 (1.09)
Cognitive salience and program endorsement						
Correctly remembered poster slogan			40.5%			
Knowledge of good friends who participated in intervention			2.43 (1.77)			
% voted for program following year			73.2%			
Teacher nominations (range: 0–20)						
Popular	0.50 (1.39)		1.85 (2.56)			
Respected	0.42 (1.10)		1.23 (1.81)			
Creates a negative environment	0.40 (1.68)		1.61 (3.20)			
Defends others	0.28 (0.79)		0.93 (1.56)			
Behaviors						
Disciplinary actions			3.17 (5.01)			
Harassment-related disciplinary actions			0.07 (0.29)			
Bought wristband			12.2%			

Note. IM = instant messaging.

(Appendix continues)

Table A2
School Network Properties at Each Wave of Measurement

Variable	Spend time ties		
	Wave 1	Wave 2	Wave 3
Number of students	273	278	263
Number of ties between Students	1,085	1,956	1,685
Density ^a	0.0148	0.0254	0.0244
Reciprocity ^b	0.221	0.198	0.199
Global transitivity ^c	0.179	0.183	0.199
Average path length ^d	4.24	3.39	3.44
Degree distribution ^e			
Max	73	76	58
M	8.06	14.03	12.78
SD	7.39	10.85	9.98

^a Ratio of the number of ties to the number of possible ties. ^b Proportion of all possible pairs of students (A, B) in which the ties between them are reciprocal, provided there is at least one tie between Student A and Student B. ^c Probability that any two people a student has direct ties to are connected to each other where the direction of connections are ignored (measured as a ratio of the number of completed triangles; sets of any three students in which there is a tie between students of the triangle) over the number of sets of three students where one student has ties to the other two (connected triples) in the network. ^d Length of shortest path (fewest number of connections) between every two pairs of students in the network. ^e Distribution of the number of all incoming and outgoing spend time ties for each student.

Table A3
The Stability of Student Friendship Ties Over 1 Year

Ties existing at T1 & T2	Ties existing at T2 & T3	Ties existing at T1 & T3
483	556	299

Note. T1–T3 = Time 1–Time 3.

Table A4
Comparability of Network Characteristics of Intervention and Control Social Referents, Contrasted to Rest of Student Body

Spend time ties:	Intervention clique leaders	Control clique leaders	Intervention widely knowns	Control widely knowns	Rest of student body
Clustering coefficient					
Wave 1	.44 (.06) ^a	.51 (.04) ^a	.12 (.02) ^b	.16 (.02) ^b	.23 (.02) ^c
Wave 2	.31 (.04) ^a	.33 (.04) ^a	.18 (.02) ^b	.19 (.02) ^b	.23 (.01) ^c
Wave 3	.33 (.01) ^a	.38 (.04) ^a	.23 (.04) ^b	.24 (.02) ^b	.23 (.01) ^c
Indegree					
Wave 1	4.91 (.21) ^a	4.61 (.46) ^a	5.00 (.81) ^a	4.88 (.49) ^a	3.75 (.21) ^b
Wave 2	9.00 (1.2) ^a	8.28 (.69) ^a	10.62 (1.4) ^b	9.30 (.82) ^b	6.24 (.29) ^b
Wave 3	6.82 (.89) ^a	8.32 (.91) ^a	7.92 (1.68) ^a	9.00 (.91) ^a	5.64 (.28) ^b

Note. Figures represent the average of individuals' scores in each group and the standard error of the average. The clustering coefficient is a measure of local transitivity (the probability that any two people a student has direct ties to are connected to each other where the direction of connections are ignored), whereas indegree is a count of each student's incoming nominations from other students in the network. Superscripts within each row indicate with identical letters the average network characteristics for each group that are statistically indistinguishable and with differing letters those that are statistically different at the $p < .05$ level.

Received March 22, 2012
Revision received July 23, 2012
Accepted July 25, 2012 ■