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Original Article

AMERICAN SOCIOLOGICAL ASSOCIATION

Teaching Sociology
2019, Vol. 47(4) 284–302
© American Sociological Association 2019
DOI: 10.1177/0092055X19860563
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Do Sociology Courses Make More Empathetic Students? A Mixed-Methods Study of Empathy Change in Undergraduates

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Abstract

Assessing course goals is often challenging; assessing an abstract goal, like empathy, can be especially so. For many instructors, empathy is central to sociological thinking. As such, fostering empathy in students is a common course goal. In this article, we report the initial findings of a semester-long assessment of empathy change in undergraduate students (N = 619). We employ a mixed-methods research design that utilizes qualitative instructor data to determine independent instructor-level variables and student surveys to measure student empathy change. We compare empathy change between students enrolled in introductory sociology classes to students not enrolled in sociology classes and test which student and instructor variables predict empathy change. We find that students taking sociology classes have positive empathy change compared to those who do not. We interpret these findings as evidence that study of sociology promotes empathy development and discuss implications for the classroom and further research.

Keywords

empathy, mixed methods, course goals, learning outcomes, introductory courses

Many of our colleagues argue that empathy is necessary to fully understand the structural social forces that affect social behavior (Ghidina 2019; Latshaw 2015; Richards 2010). Some educators even use empathy itself as the tool for developing their students' sociological imaginations (see Ghidina 2019; Packard 2013; Zembylas 2012). Like other sociology instructors, we recognize the importance of empathy and have pursued the goal of increasing our students' empathy, but beyond our intuition, we lacked a tangible measure of success. As educators, we know that it is important to lay out our course goals when designing a class. Establishing goals for our students helps guide the course material, and we must structure assessments to verify whether we are reaching those goals (Sweet and Cardwell 2016). Creating test questions or essay prompts that effectively evaluate substantive learning is challenging enough, but for abstract or non-substantive goals, such as increasing a student's empathy, it may seem impossible. As an abstract and multifaceted concept, the definition of empathy is contested (Latshaw 2015). It is for that reason that we utilize the Toronto Empathy Questionnaire (TEQ), a scale designed to capture multiple components of empathy (Spreng et al. 2009; Latshaw 2015) to measure empathy levels of

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undergraduates using a pretest/posttest procedure to determine if introductory-level sociology courses actually improve students' empathy.

In this article, we begin by reviewing the literature related to empathy, including empathy as a goal in sociological pedagogy, empathy in the classroom, studies that have gauged empathy change, and individual characteristics and demographic categories that possibly relate to empathy levels. We then detail our mixed-methods approach, which utilizes student surveys and qualitative analysis of instructor data to answer the following research questions: (1) Do students who complete a one-semester introductory-level sociology course have increased empathy compared to students who do not? (2) In comparing student empathy change between introductory sociology courses, do students who complete a semester of Introduction to Social Problems have greater empathy change compared to students who complete a semester of Introduction to Sociology? (3) Finally, what instructor traits, student traits, and instructional styles influence empathy change?

BACKGROUND AND LITERATURE

The development of empathy through sociological pedagogy has had limited empirical investigation. The few existing studies have been limited to the effect of particular exercises or programs that were explicitly designed to increase empathy (Hubbard and De Welde 2003; Latshaw 2015; Wilson 2011). These scholars strongly argue that without empathy, there is no sociology; empathetic thinking is at the core of sociological pedagogy (Latshaw 2015). Moreover, provoking empathy in the classroom enables instructors to engage students better with the sensitive and difficult topics that are often addressed in sociology classrooms (Latshaw 2015). Zembylas (2012:114) argues that the use of "strategic empathy" in teaching can even help integrate students' "troubled views into anti-racist and socially just perspectives."

Empathy as a Goal

Many instructors have empathy development as an explicit or implicit goal; this stance was given powerful voice in the now famous 2010 Ted Talk "A Radical Experiment in Empathy" (Richards 2010). Richards (2010) argued that empathy is the starting point for sociological understanding in his classroom, and the ability to "attend to other lives and visions" is crucial for sociological teaching and analysis. However, developing empathy is not a universal goal for instructors of sociology. Some reject the emotional component of sociological training, preferring to focus on the pure empiricism of the discipline. Sociology has a long-standing reputation as a liberalizing force in the university, a reputation that these instructors may be attempting to minimize with their focus on empiricism (Brouillette 1985). However, certain educational disciplines have reported concern that their students are losing empathy as they complete their educational programs (see Cunningham 2007; Konrath, O'Brien, and Hsing 2011; Neumann et al. 2011; Ward et al. 2012; S. White 1997; Wiseman 1996). As such, developing empathy through sociological understanding could be a valuable component of higher education, but empirical evidence of this effect is needed since universities increasingly emphasize assessment of learning outcomes for all departments (McDuff 2012).

Researchers outside the field of sociology have also emphasized the role that empathy plays in higher education, and research shows a decline in the empathy of college students, both generally and in specific areas of study (Konrath et al. 2011; Neumann et al. 2011). In medical fields, for instance, research has shown that medical students, residents, and nurses often become less empathetic toward patients over time (Neumann et al. 2011; Ward et al. 2012). Sociology has recently been added to the MCAT, comprising 30 percent of the Psychological, Social, and Biological Foundations of Behavior section (Association of American Medical Colleges [AAMC] 2015). While medical professions have attributed this addition to the importance of understanding social determinants of health (AAMC 2011), research indicates that sociological training for medical students could protect against empathy loss during medical school while enhancing students' medical practice. As evidence, pre-med students who took General Sociology for Pre-med Students indicated that taking the course could help them become a better doctor (Olsen 2016:73). Davis (1990), a scholar in the physical therapy field, stressed that though we might not be able to teach empathy directly, educators can create experiences that allow their students to become medical professionals who can and do empathize with their patients. For health practitioners, having a structural understanding of sociology could be an effective, indirect way to encourage empathy development.

Empathy as a Tool

Given the argument that empathy allows people to relate to one another positively (Konrath et al. 2011), empathy is particularly essential when framed as a tool for increasing teaching effectiveness amid growing cultural diversity in classrooms (Warren 2014). Many scholars want to impart empathetic understanding to their students (Richards 2010), which is highlighted by works that emphasize the role that empathy plays in teaching effectiveness (see Cruz and Patterson 2005; Segal and Wagaman 2017; Warren 2014; Zembylas 2012). Especially given that the diversity of classroom demographics is increasing and people remain socially interdependent (Konrath et al. 2011), Cruz and Patterson (2005) argue that gaining empathetic understanding is crucial to being able to reduce prejudice in the classroom.

The cognitive elements of empathy can be essential critical thinking tools (Gallo 1989; Greathouse and Dowd 1996; Paul and Elder 2006). The many cognitive facets of empathy (such as perspective taking, refraining from judgment, and understanding of deviance and othering) are important in discussion, analysis, and understanding of sociological topics (for examples, see Bruin 1985; Drwecki et al. 2011; Dunn 1981; Galinsky and Moskowitz 2000; Gilin et al. 2013; Hubbard and De Welde 2003; Latshaw 2015; Vescio, Sechrist, and Paolucci 2003). Perspective taking is also a part of social functioning, moral reasoning, and cognitive function, with several vital outcomes relevant to sociological thinking: more positive evaluations of others, decreased intergroup judgments, and reduced reliance upon stereotypes (Galinsky and Moskowitz 2000; Vescio et al. 2003).

Strategies Used to Cultivate Empathy

Evidence shows that elements common in sociology classrooms can increase empathy, including perspective taking (Batson et al. 1995; Gilin et al. 2013; Monroe 2006; Vescio et al. 2003), simulations (Cruz and Patterson 2005; Greitemeyer, Osswald, and Brauer 2010), and social interactions (Everhart 2016; Hubbard and De Welde 2003; S. White 1997; Wilson 2011). These classroom activities are often followed by writing assignments and/or class discussions (see (Edwards 2010; Everhart et al. 2016; Hubbard and De Welde 2003; Latshaw 2015; MacNamara, Glann, and Durlak 2017). Specifically, reflective writing is used as a tool to increase empathy by allowing students to process what they have learned, how they felt, their personal experience, and the feelings and experiences of others (Everhart 2016). Classroom discussions are another tool used by instructors to cultivate empathy (Bayne 2011; Everhart et al. 2016). The discussion time can be used in a similar way as reflective writing, but it also allows for students to hear the perspectives of other students. A study with the goal of improving empathy among medical students found that engaging students in directed discussion was a beneficial tactic (Bayne 2011). If classroom discussions are organized in such a way that everyone feels comfortable participating, they can improve the intellectual empathy of all students; however, successfully creating such an environment is difficult (Linker 2015). Gallo (1989:114) argues that "the attributes which characterize empathy correlate with those of effective critical thinking and imagination." Following the argument that empathy and critical thinking are linked (Jeong 2015; Linker 2015; Paul and Elder 2006), strategies used to promote critical thinking (including writing and discussion) could foster empathy.

Documented Empathy Change in Sociology Classrooms

Since empathy is a salient topic in higher education, various studies have undertaken to clarify the role empathy plays in the cognitive understanding of complex social issues. These studies suggest that empathy is an important cognitive tool for engaging in discussion on the difficult topics that often occur in sociology classes (Latshaw 2015). In an illustrative classroom example, Hubbard and De Welde (2003) document how students engaged with their emotions by writing fictional coming-out letters to a loved one. Students increased their cognitive understanding of the societal barriers faced by lesbian, gay, bisexual, transgender, and queer (LGBTQ) people, confronted their own homophobia, and grappled with the dangers, stigma, and consequences of sexuality in society (Hubbard and De Welde 2003). The authors argued that the emotional and intellectual aspects of this topic cannot be separated, and as such, they sought to harness students' emotions to promote learning, understanding, and empathy (Hubbard and De Welde 2003). Though students and their instructor wrestled with both emotions and intellectual thought during the classroom activity, the authors found that the students increased their sociological

understanding of hate crimes, fear, and targeted groups (Hubbard and De Welde 2003).

In a similar study, after a brief simulation about the experience of being a survivor of domestic abuse, students exhibited increases in empathetic concern across multiple indicators (Latshaw 2015). Students gained an increased understanding of the social constraints survivors must navigate in seeking help, an increased appreciation that domestic abuse is a reality (rather than an abstract concept), a reduced engagement with victim blaming, and a decreased reliance upon individual dispositions to explain why abuse situations continue. Latshaw (2015:278) argues that a classroom simulation activity can "be used as a tool to develop empathy among students taking a variety of sociology courses" but notes that research should study teaching empathy across more extended periods. Our study seeks to accomplish this by using a quasiexperimental design spanning an entire college semester, and we predict that experiencing a semester-long sociology course will elevate empathy levels among students.

Individual Demographic and Individual Characteristics Related to Empathy

As sociologists, we know that the intersections of our demographics influence our experiences and therefore could influence our abilities to relate to and empathize with others. Studies of the relationships between age or political ideology and empathy have yielded some interesting and conflicting findings. Cross-sectional analyses of age and empathy show that in adults, age is negatively associated with empathy (Schieman and Van Gundy 2000) or that adults display "an inverse-U-shaped age pattern" where empathy peaks at middle age (O'Brien et al. 2013:172); in longitudinal analysis, however, age does not appear to have a significant relationship with empathy change (Grühn et al. 2008). These varying results point to cohort effects as opposed to age effects. Although limited in number and scope, previous studies have found that conservative ideologies or the support of politically conservative policies are associated with lower scores on empathy measures (Hirsh et al. 2010; Iyer et al. 2012; McCue and Gopoian 2000; Pratto et al. 1994). Hasson et al. (2018) found that liberals wanted to feel more empathy toward others and had more motivation to be empathetic than conservatives. Others have argued that "rather than liberals and conservatives differing in terms of the degree of empathy they possess, they instead differ in terms of the targets of that empathy" (Waytz et al. 2016:63).

Sociologists may find it sensible to assume that those belonging to minority demographic categories might be more empathetic than those who identify with the majority demographic categories. The most consistently found relationship is between gender and empathy, with adult women and teen girls being more empathetic than adult men and teen boys (Berg et al. 2011; Grühn et al. 2008; McCue and Gopoian 2000; Mestre et al. 2009; O'Brien et al. 2013; Schieman and Van Gundy 2000; Toussaint and Webb 2005; Ward et al. 2009). Previous studies have found that gay men are more empathetic than heterosexual men (Lippa 2005; Perry et al. 2013; Salais and Fischer 1995; Sergeant et al. 2006). Sampling issues have led researchers to remove women and people of color from their samples (see Salais and Fischer 1995), and large gendered effects resulted in some researchers to limit their comparisons to within-gender categories (Lippa 2005). On the basis of previous research, we can conclude that gender differences in empathy are expected, but more research with larger and more diverse samples are needed to pinpoint that a relationship between sexuality and empathy exists.

Although it might be expected to find that racial minorities have more empathy than whites, most studies have reported no significant differences in empathy across racial and ethnic groups (see Sherman and Cramer 2005; Ward et al. 2009). This could be a result of sample size issues (Berg et al. 2011; O'Brien et al. 2013) or how empathy is measured (Berg et al. 2011). Berg et al. (2011) compared white medical students to Asian American medical students using two different measurements of empathy and found that there was no racial difference in one of their measurements of empathy but found a significant difference in their other measurement of empathy, indicating that white medical students were more empathetic than Asian American medical students. As for socioeconomic status (SES) or class and empathy, scholars have found that higher SES is associated with lower compassion (see Piff and Moskowitz 2017; Stellar et al. 2012). However, another study found that the SES of parents may have a positive relationship to their children's level of empathy (Jolliffe and Farrington 2006). The current empathy literature may not show a clear-cut relationship between gender, race, sexuality, class, age, or political identification and empathy levels. However, by including these variables in our study, we are positioned to

contribute to the sociological discussion of their intersections with empathy in the undergraduate teaching context.

METHODS

Overview

To determine any changes in empathy over the semester, we administered a pretest and posttest survey that utilized a tested empathy scale to a large sample of undergraduate students. To evaluate which factors affect empathy development in students, we collected demographic and educational information from students and asked about students' perceptions of their instructors. We also conducted interviews with instructors and analyzed their teaching philosophies to identify characteristics of their class design, course content, instructor identity, and instruction style that we theorized may influence empathy development outcomes.

Our primary hypothesis is that completing introductory-level sociology courses increases the empathy of undergraduate students. To identify a causal relationship, we used a pseudoexperimental design that tested student empathy levels at the beginning and end of a semester, comparing students enrolled in an introductory college sociology course to those who were not. We collected qualitative data on the participating instructors between the first and second student surveys through obtaining their current teaching philosophy and conducting a semistructured interview. We analyzed these data to develop additional questions for the second student survey and to produce independent variables for statistical models. These new variables and questions gauged aspects of teaching style, instructor emphasis on empathy development, and methods of assessment.

We used a minor degree of deception in the study, as students were not made aware that empathy was the focus of the study. When referring to the purpose of the study, all recruitment tools and instruments utilized the ambiguous language of "impact of introductory courses on social attitudes." We justified this deception because empathy is a desirable trait and as such could result in biased responses that damage the validity of the data. This minor deception did not result in increased risk for the participants. This study involved the use of human subjects, and the minor use of deception was approved by our university's institutional review board.

Sampling and Data Collection

The sample consisted of students and instructors at a large state university in the Southeast. The sample consisted of two groups. The treatment group (TG) consisted of students enrolled in introductory-level sociology classes (Introduction to Sociology and Introduction to Social Problems). The comparison group (CG) comprised students not currently enrolled in any sociology classes. Previous studies have shown that simply attending college can have significant effects on a range of personal, social, and political attributes (Astin 1977; Mayer 2011; Padgett, Johnson, and Pascarella 2012; Rest and Narvaez 2014; H. White et al. 2006). Therefore, we felt the need to account for the effect of "the college experience" on empathy change by including a comparison group of students attending the same university but not enrolled in sociology. Recruitment for participation in the study began with instructors teaching the designated courses. The research team then solicited the participation of the students enrolled in the classes taught by the instructors who agreed to participate.

The TG was recruited by inviting all 21 instructors who taught Introduction to Sociology or Introduction to Social Problems to participate. Eighteen sociology instructors agreed to participate (86 percent), resulting in access to 19 sociology classes. We sampled students for the CG in introductory-level physical science courses. Completion of an introductory science course is required for all majors at the university, and as such, those classes provide a snapshot of students that reflects the overall composition of the institution. We recruited three instructors teaching the introductory-level classes for biology, chemistry, and geology, allowing access to five different classes. By spreading out the CG among three disciplines, we attempted to compensate for any selection bias related to which science class students chose. The CG consisted of students enrolled in two biology classes, two geology classes, and one chemistry class. Surveys administered to the CG included a question asking what sociology classes, if any, the student was currently enrolled in. Only one student in the CG was also enrolled in a sociology course and was removed from the sample.

For conceptual clarity, it is crucial to emphasize that the variable being isolated is current enrollment in an introductory sociology course. The purpose of this study is not to compare students in a sociology class to those in a physical science class nor to control for enrollment in any other specific classes. All participating students are assumed to

be enrolled in a variety of classes, including students in the TG being enrolled in physical sciences. Through this design, we can determine the effects of an introductory-level sociology course on empathy for students being concurrently exposed to a variety of other knowledge discourses inherent to a college experience.

All data collection occurred during fall semester 2017. Participating instructors who had a written teaching philosophy submitted it after agreeing to participate. All instructors completed a semistructured interview. Development of the interview guide was partially informed by analysis of the teaching philosophies, and the same interview guide was used for all instructors. The interviews were conducted by two members of the research team and ranged from 15 to 45 minutes in length. We conducted instructor interviews between the semester midpoint and the second survey administration.

We collected data on the student participants with an in-person paper survey, administered in two phases. Participating students completed the initial survey on the first day of class to avoid exposure to any course material that may impact empathy. The second phase of data collection occurred during the two weeks before finals. Both surveys contained questions about basic demographic information, information about the student's education, and the TEQ, a 16-question scale that measures empathy as an emotional process (Spreng et al. 2009). Informed by the qualitative instructor data, the second survey had several additional questions regarding the students' perceptions of their instructor's demographics and personal characteristics.

We calculated response rates as the proportion of students who participated out of how many were present in the classroom. Overall, 85 percent of students present on survey days participated. Once data entry and cleaning were complete, we matched the first and second surveys using the student identification numbers. Of the 954 posttest surveys completed, 639 were matched to a pretest survey, which composes our analytic sample for all the findings reported here. Our student sample was 71 percent women, 28 percent men, and 1 percent people who identified as a different gender category (such as genderqueer). Our sample consisted of predominantly students of color, with 24 percent white students, 44 percent black students, 15 percent Latinx students, 16 percent Asian students, and 1 percent students who identified as other races. In our sample, 85 percent of students identified as heterosexual, and 15 percent of students did not (e.g., lesbian, gay, bisexual, queer). Mean value analysis and *t* tests revealed no patterns or statistically significant difference in important variables between surveys with and without matched data.

Analysis Strategy

Qualitative analysis. Each teaching philosophy and interview transcript was coded independently by two separate research teams. Each team went through four waves of coding before joining the coding systems together to reconcile any differences between teams. As to not be limited by preconceptions, initial coding for both the teaching philosophies and interviews was approached inductively to produce codes. Subsequent rounds used those codes and others based on the research questions to deductively identify expressions of empathy and other variables of interest. The instructors' teaching style variables, such as focus on writing and real-life application, were derived from the instructors' responses to our questions regarding class structure and purpose of their assignments. Coding research teams also kept reflective journals in which they jotted down any thoughts they had when coding, such as observations related to the research questions, as well as specific changes to code themes, expansions, definitions, and parameters and intentions of coded categories. By keeping reflective journals, the researchers we able to address any bias that formed during the coding process and be reflexive of their interpretations of the material. The coders used these journals during the coding reconciliation process to ensure that the meanings of each code and subcode could be jointly agreed upon.

Quantitative analysis. To establish a comprehensive understanding of the data, the first step in our analysis was to determine what factors may predict incoming empathy of students. Doing so answers two important questions. First it establishes whether the respondents follow the overall patterns in empathy detailed in previous literature. Considering that our data come from a single university that is both urban and racially diverse, determining differences in incoming empathy is important to understanding our results. Second, it helps determine if there are any selection effects for the CG and TG as well as for sociology class type. For these tests we employed a series of ANOVAs and an ordinary least squares (OLS) regression.

For our primary analysis of empathy change, we had to determine whether multilevel modeling was appropriate. Since the students in the sample share classrooms and instructors, these data are clustered. Multilevel modeling should be considered when using clustered data, as disaggregation of group-level data to the individual level causes correlation in error terms, which violates a basic assumption of multiple regressions (Allison 2009). For this reason, we calculated the intraclass correlation coefficient (ICC) to determine if multilevel modeling was appropriate. We found that all meaningful variation in the dependent variables occurred at the individual level, making multilevel modeling inefficient (Luke 2004).[1] Therefore, we proceeded with standard OLS regression.

Considering the lack of empirical studies on empathy, our original data collection captured a wide variety of information that we thought may prove useful. We eliminated variables using a forward and backward iterative stepwise procedure. For the sake of parsimony, variables that reduced model fit were excluded unless we thought their lack of effect was particularly meaningful. This was the case with several instructor variables that are included. All models were tested for multicollinearity, and all individual-level variables, as well as those in the final model, showed a variance inflation factor (VIF) below the conservative standard of 2.5 (Allison 2009). Several instructor variables showed a VIF between 2.5 and the more generous standard of 10 (Meyers, Gamst, and Guarino 2016.). The instructor model was robust to this moderate multicollinearity through a joint hypothesis test of these variables ($p = .82$).

Dependent Variables

Both of our dependent variables, incoming empathy and empathy change, were produced from the students' responses to the TEQ. The TEQ consists of 16 questions with responses in Likert scale format with a five-point response range (1–5; Spreng et al. 2009). The mean of all scale items answered was used for the students' empathy scores. The TEQ was ideal for our study for several reasons. The TEQ was derived from several existing measures of empathy but through factor analysis was reduced to only 16 questions (Spreng et al. 2009). Its brevity is a great strength, as we did not want participating classes to be burdened by a lengthy survey or to become disengaged. Finally, despite its short length, the TEQ captures many aspects of empathy, including emotional comprehension, perspective taking, personal distress, and sympathy (Spreng et al. 2009).

As a condensed and tested amalgamation of multiple empathy measures, the TEQ questions maintain an overall breadth while independently assessing slightly different components of empathy. For instance, the two items "Other people's misfortunes do not disturb me a great deal" and "I do not feel sympathy for people who cause their own serious illnesses" both assess sympathy, but the second measure adds the disclaimer of personal accountability. Likewise, the items "I find that I am 'in tune' with other people's moods" and "When someone else is feeling excited, I tend to get excited too" both measure a form of emotional perspective taking, but the first is a more cognitive process, while the second captures an involuntary adoption of another's state. In both phases, the TEQ showed high scale reliability, with a Cronbach's alpha of .84 on the first survey and .86 on the second.

Our first dependent variable is incoming empathy, calculated as the average of all TEQ items that were answered in the first survey. Our second, primary independent variable is empathy change, calculated as the difference between incoming empathy and the average score of TEQ questions answered on the second survey. Initial examination of incoming empathy revealed many students with high values, leaving these participants with little opportunity for empathy growth. As such, incoming empathy was included as a control in all models predicting empathy change.

Independent Variables

Our primary independent variables consist of class type and incoming empathy, which we included in every model. Introduction to Sociology and Social Problems designate students from the experimental group enrolled in those respective classes, with the reference category of comparison group. The remaining independent variables include a host of factors that we theorized would predict empathy change. Some of these hypotheses are supported in previous research on empathy, some emerged from our qualitative analysis, and others have a basis in common assumptions made by sociology instructors. We organized independent variables into student-level variables and clustered information. Student independent variables consisted of political identification, college major, to what degree they cared what their instructor thought of them, and whether they had previously taken a sociology course.

Much of the literature, as well as personal experience, suggests that political identity may predict a student's response to the sociological perspective. As such, we hypothesized it would have an effect on empathy change. Political identification was originally measured on a 7-point scale (*extremely liberal, liberal, slightly liberal, moderate, slightly conservative, conservative, extremely conservative*), but due to the small number of students reporting conservative identifications, *slightly* and *extremely* categories were collapsed, resulting in final distinctions of *liberal, moderate*, and *conservative.*

One important component when considering empathy change in students is the effect of the course material itself. Since many claim that sociological thought is inextricably bound to empathy processes (Ghidina 2019; Latshaw 2015; Richards 2010), we hypothesize that exposure to core sociological concepts inherently bolsters empathy. Sociology's focus on structural thinking, for instance, undermines assertions of rigid individual accountability that may pose a barrier to empathetic responses. However, this discourse of sociology does not exist in a vacuum: students may have been exposed to similar perspectives outside sociology and thus be less impacted by this reasoning within a sociology course. Second, students are subjected to competing discourses both before and during their time in our classes. We operationalize these discursive components of our study through analysis of student major. First, a student's major indicates repeated exposure to a particular knowledge discourse, with its own ways of making sense of the world. Second, it likely indicates longstanding ideological nuances of the student: a student is unlikely to choose a major that their ideological socialization devalues.

On the survey, students wrote their major, as we did not want to limit their choices to categories. Two members of the research team independently coded the answers, placing them into 15 categories. Using correlations and a series of regression models, we tested how these categories interacted with empathy change. A clear pattern emerged that aligned with our predictions. Many of the classifications showed no interaction with empathy change, and these fell into two distinct categories: those that had similar structural perspectives to sociology (public health, social work) and those that contain discursive elements strictly opposed to sociological perspectives (marketing, business). Conversely, four classifications of majors showed significant increases of empathy compared to all others: biosciences, computer sciences, physical sciences, and psychology. This finding is similar to previous research that has indicated differences between majors, where social science students are more empathetic than business students (Myyry and Helkama 2001), engineering students (Rasoal, Danielsson, and Jungert 2012), and physical science students (Thomson, Wurtzburg, and Centifanti 2015). We assert that these majors share a knowledge discourse that, generally speaking, neither accounts for social structures in individual outcomes nor has their knowledge inherently challenged by the assertion of social-structural thinking. For these students, sociological discourse could be a fresh and potentially exciting perspective while simultaneously easy to reconcile with their central knowledges. As such, they are more receptive to the sociological perspective and experience increased empathy as a result. For our statistical models, we collapse these four majors into the dichotomous variable receptive major.

Our instructor interviews suggest that a common idea among sociology instructors is that making a connection with and gaining the respect of students contributes to nonsubstantive goals, such as empathy. To capture this, our second phase survey had the question, "How much do you care about what your instructor (for this current class, where you are currently taking this survey) thinks of you?" with original response categories of *very much, somewhat, not very much*, and *not at all*. Since they showed no difference in relationship to empathy change, and for parsimony, *somewhat* and *not very much* were collapsed, resulting in the variables *do not care, care somewhat*, and *care very much*.

The last student-level independent variable included in this analysis is whether the student had previously taken a college sociology course. This variable is important because it can indicate if repeated classes result in increased empathy or if the current exposure had diminished returns. In addition to asking students if they had previously taken sociology, we had them designate what class and when.[2] We designate this in our models with the dichotomous variable previous sociology course.

Analysis of incoming empathy included age and class of the student, as reported on the surveys. Age was calculated based on the month and year of the student (day was omitted to increase anonymity). Class was self-reported, with the options of *working class* (reference), *lower-middle class, upper-middle class*, and *upper class*. Age and class were excluded from analysis of empathy change because they showed no analytic value and did not

contribute to the inconclusive discussion of the past studies mentioned earlier.

We produced some instructor traits thought to affect empathy development from instructor interview data. This analysis includes the variable focus on writing, which designates that the instructor stated in the interview that he or she uses writing as a learning tool and form of assessment. It also uses focus on real-life application, for instructors who said they try to connect sociology to the lived experiences of their students. Finally, the variable unprompted discussion of empathy indicates that the instructor discussed empathy or a similar concept (sympathy, compassion) before the interviewer initiated any discussion of empathy.

We originally intended to capture instructor demographics during interviews, but when we asked the instructors what identity characteristics they presented to their students, many of them were unsure how their students perceived their identities. To address this, we added questions to the second survey to capture student perception of these traits. We determined the value assigned to each instructor for these variables by aggregating all students in their classes, thus capturing student perception regardless of how the instructors intended to present themselves. For nominal variables, instructors were designated in the data as the category given by the majority of students. When fewer than 70 percent of students agreed on a category, we assigned a category based on theoretical or mathematical reasons. One instructor, for instance, was split between woman and queer. Since designating her as queer would have made her the only instructor in that category, and thus lacking in statistical power, we categorized her as a woman. For gender, all instructors were categorized as men or women, resulting in the dichotomous variable perceived woman. For race, all instructors were categorized by students as white (reference), black (perceived black), Latinx (perceived Latinx), or Asian (perceived Asian). While students were offered several options for the perceived sexuality of their instructor, these data were collapsed into the dichotomous variable perceived LGBQ (reference: heterosexual).

Control Variables

Control variables consisted of student gender, race, and sexuality and were included in all models. Since a small number of students ($n = 7$) reported a gender other than man or woman, gender was collapsed into a dichotomous variable not man (reference: man). Students were presented with a *check all* option, with the available categories of white, black, Latinx, Asian, and other. For students who selected more than one race, they were placed into a category such that any minority designation would override the selection of white, and selecting black would override Latinx and Asian.[3] Students were offered an inclusive range of options to report their sexuality, but these were collapsed into the dichotomous variable LGBQ (reference: heterosexual).

FINDINGS

Qualitative Results

A major goal of our qualitative analysis was to capture elements of teaching style and practices that may be related to empathy development in students. We hypothesized that different teaching styles (such as a focus on discussion or collaboration versus lecture) could impact empathy development in students differently. While we found some evidence to support this in our study (see Focus on Writing, in the Quantitative Results section), many of the attributes we considered theoretically important did not have significant variation in our participating instructors. Much of this homogeneity we attribute to the instructors all coming from the same university, where formal and informal structures will influence what instructors are employed and shape their pedagogy once present.

One variable we considered important was the instructors' position on empathy development as a goal. In our interviews with faculty, the final question we asked was, "Do you think either the structure of your course or your personal teaching style has an impact on the empathy of your students?" Almost every instructor, regardless of class type (including CG), responded with some variation of "I hope so." Unfortunately, this consistency prevented us from including this variable in our predictive models. However, this finding is interesting independent of our experimental hypotheses. For one, many instructors did not explicitly state that empathy was a goal of their teaching, yet they stated that they hope that it is an outcome anyway. Further, since empathy change is not documented in any standardized assessment of learning available to them, these instructors are concerned with an area of learning that is currently underassessed. This shows that instructors in various disciplines care about empathy development and suggests that assessments of empathy in higher education would be well received.

Table 1. Student Variables Regressed on Incoming Empathy.

Variable	*b*	*B*
Intercept	3.786 (–0.147)	
Introduction to Sociology (reference = comparison group)	–.063 (–.044)	–.067
Social Problems (reference = comparison group)	–.036 (–.042)	–.039
Not man (reference = men)	.256 (–.039)***	.261
Black (reference = white)	–.051 (–.046)	–.057
Latinx (reference = white)	–.042 (–.059)	–.034
Asian (reference = white)	–.096 (–.058)	–.079
Other race (reference = white)	–.128 (–.155)	–.033
Age	.011 (–.006)	.072
LGBQ (reference = heterosexual)	.076 (.050)	–.062
Lower-middle class (reference = working class)	–.032 (–.044)	–.034
Upper-middle class (reference = working class)	–.012 (–.046)	–.013
Upper class (reference = working class)	–.052 (–.147)	–.014
Conservative (reference = liberal)	.011 (–.060)	.008
Moderate (reference = liberal)	–.071 (–.040)	–.073
Model statistics		
R^2	.104	
Adjusted R^2	.083	
F	4.94	
N	613	

Note: Standard errors in parentheses.
*$p < .05$, ** $p < .01$, ***$p < .001$ (two tailed).

Quantitative Results

Incoming empathy. A series of ANOVAs and OLS regression revealed very few differences in incoming empathy levels for participating students. We suspected that students choosing to enroll in sociology classes may have higher incoming empathy but found no evidence for such a selection effect. ANOVAs revealed significant differences in incoming empathy by race, gender, sexuality, and political identification. However, as shown in Table 1, OLS regression revealed that only gender was statistically significant, with participants not identifying as men scoring significantly higher ($b = .256$; $p < .000$) incoming empathy compared to men.

Empathy change. Our modeling strategy for predicting empathy change began with a base experimental model, then we separately introduced student and instructor variables. All results are displayed in Table 2. Model 1 displays the results for empathy change by class type, controlling for the student variables incoming empathy, gender, race, and sexuality. We then expanded the base experimental model, first with student predictor variables in Model 2, then with instructor variables in Model 3. Our final model contains variables from Models 2 and 3 that displayed analytic value as well as an interaction term.

Our base experimental model suggests that students taking introductory-level sociology classes show positive empathy change compared to students not taking a sociology course. Without controlling for any other variables, students enrolled in sociology showed a positive empathy change (Introduction to Sociology, $b = .104$; Social Problems, $b = .093$) relative to the comparison group. Observing the standardized coefficients, incoming empathy was the strongest predictor of empathy change ($B = –.268$). No other student-level controls showed meaningful or statistically significant effect on empathy change. These patterns in student control variables remain stable across all four models. As expected, the fit of the base experimental model clearly requires improvement (adjusted $R^2 = .087$).

Observing the results of Model 2, several student predictor variables were statistically significant, including political identification, major of the student, and how much the student cared what the instructor thought of them. Whether the student

Table 2. Empathy Change Regressed on Student and Instructor Variables.

	(1) Base Experimental Model		(2) Student-Level Predictors		(3) Instructor Predictors		(4) Final Model	
Variable	*b*	*B*	*b*	*B*	*b*	*B*	*b*	*B*
Intercept	.637 (.126)		.727 (.131)		.847 (.190)		.726 (.130)	
Introduction to Sociology (reference = comparison group)	.104*** (.032)	.151	.087** (.032)	.127	.157** (.060)	.228	.113*** (.033)	.163
Social Problems (reference = comparison group)	.093** (.031)	.139	.071* (.031)	.106	.121* (.057)	.181	.075* (.034)	.112
Student predictor variables								
Conservative (reference = liberal)			–.154*** (.042)	–.143			–.187*** (.046)	–.174
Moderate (reference = liberal)			.014 (.028)	.019			.011 (.028)	.016
Receptive major			.072** (.027)	.106			.074** (.027)	.108
Do not care (reference = care very much)			–.166** (.062)	–.109			–.158** (.061)	–.104
Care somewhat (reference = care very much)			–.072** (.027)	–.107			–.073** (.027)	–.107
Previous sociology course			.060 (.032)	.074			.065* (.032)	.080
Instructor predictor variables								
Perceived woman[a] (reference = man)					–.009 (.069)	–0.012		
Perceived black[a] (reference = white)					–.058 (.065)	–0.065		
Perceived Latinx [a] (reference = white)					–.006 (.079)	–0.006		
Perceived Asian [a] (reference = white)					–.040 (.054)	–0.043		
Perceived LGBQ[a] (reference = heterosexual)					–.057 (.047)	–0.066	.043 (.039)	.050
Perceived class[a]					–.075 (.059)	–0.072		
Focus: Writing[b]					–.117** (.037)	–0.156	–.083** (.032)	–.111
Focus: Real-life application[b]					–.003 (.058)	–0.004		
Unprompted discussion of empathy[b]					–.013 (.048)	–0.016		
Interaction term								
Conservative × Perceived LGBQ							.245* (.106)	.100
Student control variables								
Incoming empathy	–.196*** (.029)	–.268	–.204*** (.029)	–.280	–.199*** (.030)	–.272	–.203*** (.029)	–.278

(continued)

Table 2. (continued)

	(1) Base Experimental Model		(2) Student-Level Predictors		(3) Instructor Predictors		(4) Final Model	
Variable	*b*	*B*	*b*	*B*	*b*	*B*	*b*	*B*
Not man (reference = man)	.014	.020	.003	.005	.015	.020	0	0
	(.029)		(.029)		(.029)		(.028)	
Black (reference = white)	–.013	–.021	–.030	–.047	–.009	–.014	–.026	–.040
	(.032)		(.032)		(.032)		(.031)	
Hispanic (reference = white)	.030	.033	.031	.034	.022	.024	.022	.024
	(.041)		(.040)		(.041)		(.040)	
Asian (reference = white)	.005	.006	–.020	–.022	–.002	–.002	–.025	–.028
	(.041)		(.041)		(.041)		(.041)	
Other race (reference = white)	–.108	–.038	–.128	–.045	–.089	–.031	–.144	–.050
	(.113)		(.110)		(.113)		(.110)	
LGBQ (reference = heterosexual)	–.048	–.053	–.059	–.065	–.050	–.055	–.061	–.067
	(.036)		(.035)		(.036)		(.035)	
Model statistics								
R^2	.101		.154		.121		.172	
Adjusted R^2	.087		.133		.095		.147	
F	7.57		7.33		4.60		6.91	
N	619		619		619		619	

Note: Standard errors in parentheses. LGBQ = lesbian, gay, bisexual, or queer.
[a]Student perception variables based on aggregate of students who answered each question. [b]Instructor interview questions indicate concept expressed by respondent.
*$p < .05$, ** $p < .01$, ***$p < .001$ (two tailed).

had previously taken a sociology course approached significance ($p = .059$) and was therefore considered for the final model. Coefficients for class type fell slightly (Introduction to Sociology, $b = .087$; Social Problems, $b = .071$) but retained significance. The inclusion of student predictor variables improved model fit considerably (adjusted $R^2 = .133$) compared to Model 1.

The only instructor-level variable that impacted empathy change (Model 3) was a negative effect for students of instructors who focused on writing ($b = –.117$). However, perceived sexuality of the instructor showed signs of improving model fit, and therefore we considered it for the final model. The lack of findings in this model aligns with the results of our ICC, confirming that in this sample most of the variation in empathy change can be attributed to individual-level variables.

Our final model contains all the meaningful variables from the previous models and introduces an interaction term. As a result, it has the best model fit (adjusted $R^2 = .147$). Regarding our primary research question, the importance of class type remained robust in the final model, showing strong evidence that taking Introduction to Sociology ($b = .113$) or Introduction to Social Problems ($b = .075$) results in greater empathy change compared to students who are not taking sociology.

Student predictor variables remained similar to the effects from Model 2. While there was no statistically significant difference between liberal and moderate students, conservative identification predicted a .187 reduction in empathy change compared to liberals and, based on standardized coefficients, was the most powerful predictor variable in the final model ($B = –.174$). Another major predictor of empathy change was how much the student cared what the instructor thought of them. Students who reported that they cared only somewhat ($b = –.073$) or not at all ($b = –.158$) about their instructor's opinion of them reported significantly reduced empathy change. Students with a major receptive to sociological discourse showed an increased empathy change ($b = .074$). In addition, the variable previous sociology course achieved statistical significance, showing additional positive empathy change ($b = .065$).

For instructor predictor variables, the effect of an instructor who focuses on writing remained significant, but the effect was reduced (b = –.083) compared to Model 3. Throughout our analysis, perceived instructor sexuality had shown signs of analytic value through improving model fit and statistical significance in preliminary tests. To investigate this effect, we created and tested a number of interaction terms between perceived instructor sexuality and various student traits, including gender, race, sexuality, and political identification. Of these, the interaction term for an instructor perceived to be LGBQ and conservative student identification appeared to isolate and capture the variation caused by perceived instructor sexuality. When both of these variables are included in Model 4, perceived LGBQ loses significance, but the interaction term shows considerable effect on empathy change (b = .245). This indicates that while moderate and liberal students' empathy changes are not affected by having a LGBQ instructor, conservative students gain empathy as a result of this pairing.

DISCUSSION

Sociology instructors often have the explicit or implicit goal of encouraging empathy in their students (Latshaw 2015; Zembylas 2012). Yet while we regularly assess the effectiveness of techniques aimed at substantive learning goals, the ways we attempt to bolster personal growth and insight are infrequently, if ever, evaluated empirically. Far too often we simply rely on intuition to gauge if we are connecting with our students in a way that encourages ethical, compassionate citizenry. This study empirically addresses the fundamental question of whether exposure to the basics of sociology bolsters empathy in students. Throughout our statistical models, the positive impact of taking an introductory-level sociology class on student empathy remained robust. This is strong evidence that empathy levels are bolstered by exposure to basic sociological understanding. We were surprised that Introduction to Sociology had a larger influence on empathy change than the Introduction to Social Problems course, as we had assumed that a course that focused specifically on social issues could lead to greater empathy gain. Both courses had a positive impact on empathy change, but this finding could point to inherent differences in the course material, how the class is approached, or how the content is received by students.

Overall, these findings are of considerable interest and use to instructors of sociology everywhere. Instructor goals for empathy development may vary, but the knowledge about empathy development is certainly valuable even for those who reject empathy as an explicit goal. Furthermore, for those outside of sociology who find themselves concerned with aspects of empathy, we hope that these findings will foster the inclusion of sociological thinking in other realms of higher education.

Beyond the primary results of this study, we discovered considerable details about patterns in undergraduate empathy change. Perhaps one of the most important is the finding that instructor traits had very little to do with empathy change. When this research was being conceived, we predicted that considerable variation would exist at the clustered level of the data, but both the ICC analysis and the insignificance of the instructor traits defy those expectations. While this may initially be thought of as unfortunate, we argue the opposite. In light of the general gains to empathy for taking a sociology class, the lack of instructor trait effects suggest that it is the content of the course that bolsters empathy, not the individual instructor. This interpretation is backed by the positive effects on students with receptive majors. Students in these fields are continuously socialized to conceive of the world with an individualistic narrative. Consider a pre-med student learning about the social structural determinants of health, a psychology major exposed to data about mental health outcomes for LGBTQ people, or the biology student who is exposed to a social constructionist perspective on race and gender. Sociological understanding may balance the narrative of these students' education, encouraging a critical and nuanced approach to their thinking that ultimately leads to compassionate perspective taking.

Two instructor traits did have significant impact on empathy. Conservative students in classes where the instructor was perceived as LGBQ had positive empathy change. We can only speculate as to the reasons for this outcome. Perhaps for many students, especially those from rural areas of the South, this may be their first exposure to someone in a position of respect who is openly queer—an experience that bolsters empathy. Certainly, LGBQ instructors may approach certain class topics differently than non-LGBQ instructors or even share elements of their personal lives that touch students. There are only a few studies that discuss the possible effects of having an openly LGBQ teacher on the students, but each author of these reports concludes that students'

exposure to an "out" teacher helped them become more understanding of others (Macgillivray 2008; Rofes 2000; Wright 1993). Regardless, this finding deserves further investigation.

The negative effect of instructors who focus on writing is also surprising, especially considering that numerous medical education programs have used reflective writing as a tool to increase empathy in their students (Chen and Forbes 2014; DasGupta and Charon 2004; Ilcewicz, Poirier, and Pailden 2018). An instructor's focus on writing and its negative relationship with empathy change in students may be due to the pressures many students feel around writing at the college level. Students trying to adjust to performing in college, especially in their first year, may be overwhelmed by an introductory class that has a focus on writing. Future investigation with additional qualitative depth (specifically which types of writing that are emphasized in the class) and a larger sample of instructors with more varied teaching styles could lead to further insight on this variable.

Most of the variation in empathy change was predicted by individual-level traits but not by basic demographics. Gender, race, age, sexuality, and class all had no effect on empathy change. We offer two explanations for this outcome. First, this may be a result of the characteristics of the sample university, which has exceptionally high diversity, particularly by race and sexuality. Selection effects for this type of university, or the experience of attending such a college, may have diluted or negated these effects. Repeating this study at a university located elsewhere with different demographics may yield different results. Another explanation aligns with our explanation of the lack of difference by instructor traits: it may be that the cognitive engagement of sociological understanding, and the effect this knowledge has on empathy gains, largely transcends these traits. This explanation is a logical one, as the ideological stances sociological thinking often challenges—individualism, meritocracy, essentialism—are not tied to race, gender, or sexuality but rather are central doctrines of our society. As such, the counternarrative of sociology, and the resulting increase of empathy, would not differ by these traits.

Along this line of thinking, we position the impact of political ideology on empathy gains. While there was no statistical difference between moderates and liberals, students who identified as conservative experienced considerably less empathy change. Furthermore, the standardized coefficient indicates that this was the second most powerful variable in the final model, with almost as great an impact as taking an Introduction to Sociology class (and more than the result of taking Introduction to Social Problems). If we attribute the main positive empathy change in the treatment group to the ideologies that sociological thinking challenges, it would follow that conservative students would be more resistant to these narratives. Conservative politics in the United States embodies and relies on assumptions of individual responsibility. Therefore, students who identify as conservative may be more resistant to structural explanations of individual outcomes and as a result experience less empathy increase. However, conservative students who were enrolled in a sociology course with an instructor they perceived as LGBQ saw larger increases in empathy compared to liberals and moderate students. Given this interpretation of the findings, the question that remains for sociology instructors is how to dismantle these cognitive barriers to structural thinking.

Instructors have, for some time, wrestled with and argued over issues about student interactions. Should we attempt to make our classes entertaining? Should you try to form a personal connection with your students or remain professional? These questions often come down to student investment and engagement and are conceptually important for causing deeper reflection and critical thinking. If a student simply does not care about an instructor, he or she is unlikely to internalize the messages that instructor extends. We attempted to capture this with a question of students' overall concern for their instructor's perception of them. While we assume there is some variation in how different students interpret this question, the attitude of students toward their professor is important for empathy change. Much like political identification, how to approach this challenge is a decision for individual professors.

Overall, we interpret our findings as evidence that exposure to sociology increases empathy in undergraduate students. Furthermore, the factors that predict variation in that change suggest that empathy change results from the empirically based counternarrative of critical structural thinking promoted by sociology. Many individual items on the TEQ capture a difference in perspective between seeing personal troubles as the result of individual traits versus attributing outcomes to structural factors. When students understand the empirical evidence for sociological arguments, understand the methodological rigor that evidence is held to, and grasp logical challenges to

essentialist explanations, they can feel motivated to empathize with others.

Limitations

There were several limitations to this study that we wish to address. First, as was mentioned briefly in the Discussion, all participants in this study came from a single university. This may have affected several of the findings. Regarding instructors (especially in sociology), different departments have variation in culture, areas of study, and pedagogical structure that could result in differences in empathy change. Our sample of instructors also limited our ability to determine differences in empathy change. Continued research should administer a prescreening assessment of instructor traits and purposefully sample variation on these traits. Alternatively, we could have captured certain aspects of the classroom through students' perceptions, much like the instructor traits; asking students if the class was lecture heavy or discussion based may have proven effective. Also as stated previously, the student demographics of the sample university are unique, and differences may be found in predominantly white, upper-class, or private universities. Finally, the sample university was located not only in the Southeast but in a major urban center—both characteristics that could have a predictive quality for empathy change. All these concerns are easily compensated for by recreating this study using a variety of universities.

An aspect of empathy change in college students that may be of interest would be to compare the effects of sociology to other classes that study the human experience. While such a comparison was beyond the scope of our research, our findings around which majors experienced positive empathy change suggest that a more nuanced examination of whether other social sciences courses affect empathy is in order.

Some limitations surround the minimal resources (and resulting methodological choices) available to our team. First, while there were advantages to administering the surveys in person, such as the excellent response rate, testing students during stressful times of the school year (toward the end of the semester with final examinations looming) may have biased their empathy answers in different directions. Some students who are personally stressed may have felt that they could relate empathetically to the hypothetical people on the TEQ who experienced sadness or personal trials, while other students may have reacted to their personal stress by answering less empathetically on the TEQ. A future study should better account for how the real social context students face at the time of data collection could impact their TEQ scores.

Another limitation is that the permanence of empathy change is beyond the scope of this study. This could be addressed with a follow-up survey sometime after the classes were completed. In some students, the empathetic perspective they gained may fade, while for others, the seeds of structural thinking could encourage increased empathy over time. A future study should also take a longitudinal approach, tracking students' empathy levels from their first year until conclusion of their undergraduate degree and beyond. Understanding the variables that determine a longitudinal outcome would be quite valuable.

CONCLUSION

As instructors and sociologists, we see many connections between empathetic understanding and the sociological imagination. Indeed, we argue that using the sociological imagination is a form of practicing empathy (Ghidina 2019): it quite explicitly asks sociological thinkers to put themselves in another's shoes (which maps onto the aspect of empathy called "perspective taking"). Sociology plays an important role in undergraduates' understanding of the social world through empirical knowledge and study. Through methodological rigor and powerful, complex theory, sociology instructors explain social phenomena, develop causal arguments, and challenge preconceptions of so-called common knowledge. While this empirical understanding is fundamental to what we do as sociologists, the role of sociology in the university classroom is more than understanding social facts and figures. Most students who are exposed to sociology at the undergraduate level will merely brush up against our discipline as they complete one or two introductory-level courses—often motivated solely by the fulfillment of a required credit.

What is our goal as sociologists during students' brief stay in our complex scientific world of perpetual social inquiry? Certainly, most of us would answer that we wish to help our students understand their world empirically—to cut through the rhetoric and ideological arguments we are all presented with and comprehend the role of social structure in our lives. However, another goal lingers inside many of our classrooms, one that some have argued is fundamental to everything we do as sociologists: the ability to

see and feel the world from another's perspective (Dorn, 1989; Warren, 2014). In fact, during our interviews, many sociology instructors identified development of empathy, or empathy by another name, as a primary motivation. Our research shows that even a brief encounter with our discipline can offer an opportunity to nurture empathy through sociological understanding.

EDITOR'S NOTE

Reviewers for this article were, in alphabetical order, Marcia Ghidina, Renee Monson, and Barbara Prince

AUTHORS' NOTE

The preliminary results for this article were presented at the 2018 annual meeting of the Society for the Study of Social Problems. We would like to thank the editor and reviewers for their time and feedback on this article. In addition, we are tremendously grateful to Mindy Stombler, our faculty advisor, for her support and for inspiring us to conduct pedagogical research. We are also thankful to our department chair, Eric R. Wright, for supporting graduate student research projects. We are especially thankful to Ben Lennox Kail and Daniel Pasciuti for their valuable statistical knowledge and time. We would also like to thank all of study participants and our undergraduate interns who helped make data collection possible.

FUNDING

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Partial funding for this research was provided by Georgia State University's Center for Excellence in Teaching and Learning 2018–2019 Mini-Grant (Mindy Stombler, PI).

NOTES

1. The intraclass correlation coefficient (ICC) was calculated for both dependent variables, designating clusters by instructor and class. The highest calculated ICC was for empathy change clustered by class at .045, meaning only 4.5 percent of the variation was occurring at Level 2 (Luke 2004).
2. This improved validity, because we recoded students who marked *yes* but reported a social science class that was not sociology (for example, numerous students marked *yes* but wrote in that they took a psychology class in high school).
3. We also created and tested a dichotomous variable that designated all students who selected more than one race option, but it showed no analytic value and thus was excluded from this analysis.

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