COMING OUT TO THE CLASS: IDENTIFYING FACTORS THAT INFLUENCE COLLEGE BIOLOGY INSTRUCTOR DECISIONS ABOUT REVEALING THEIR LGBQ IDENTITIES IN CLASS

Katelyn M. Cooper, Sara E. Brownell, & Cara Gormally

The lesbian, gay, bisexual, transgender, and queer (LGBTQ) identity is an understudied yet potentially important identity for individuals in an undergraduate biology classroom. Although the choice to “come out” or reveal one’s LGBTQ identity is a personal decision, LGBTQ college instructors may positively impact students when they reveal their identity in the classroom. We conducted a national survey of LGBTQ biology instructors about their experiences as members of the LGBTQ community teaching college biology. We found that over half of the biology instructors that we surveyed are out to their work colleagues, but less than 20% are out to their students. Additionally, we conducted semistructured interviews with 11 LGBQ college biology instructors and applied the expectancy value theory to understand what influences instructors’ decisions about whether to reveal their LGBQ identities to students in their college biology classrooms. From the interviews, we identified a suite of potential costs and benefits associated with instructors coming out to their classes. Costs included wasted class time that could be spent teaching biology content, the instructor potentially losing their job, and students developing a negative view of the instructor. Benefits included the instructor living more authentically, students feeling more comfortable in the classroom, students knowing a supporter of the LGBTQ community in the classroom, and students having an LGBQ role model in science. Based on these findings, we highlight how perceiving high value and low cost to coming out is relevant for instructors’ decisions to reveal their LGBQ identities in their college classrooms.

KEY WORDS: LGB, LGBQ, LGBQ, LGBT, instructors, undergraduate, biology, STEM, coming out, inclusive teaching practices, expectancy value theory

1. INTRODUCTION

The lesbian, gay, bisexual, transgender, and queer (LGBTQ) identity is a social identity that has
been relatively underexplored in the context of undergraduate science, technology, engineering, and math (STEM) education. While an estimated 4.1% of the United States population identify as LGBT, and the percent of millennials who identify as LGBT is even higher (7.3%) (Gates, 2017), to our knowledge, no studies have reported the prevalence of LGBTQ individuals in STEM. However, empirical studies may be difficult to do because they require individuals to reveal their identity and STEM environments, including the STEM workplace and STEM academic environments, have been historically unfriendly to LGBTQ individuals. Therefore, LGBQ individuals in STEM may be uncomfortable or unwilling to reveal their identity (Bilimoria and Stewart, 2009; Patridge et al., 2014; Yoder and Mattheis, 2016).

The choice to reveal one’s LGBQ identity is a unique aspect of this social identity. The LGBQ identity is an invisible identity for many individuals (de Monteflores and Schultz, 1978; Quinn, 2006; Reynolds and Hanjorgiris, 2000). Thus, LGBQ individuals need to make the decision to “come out” to let others know how they identify since it is often assumed that a person is straight and cis-gendered (Bilimoria and Stewart, 2009; Braun and Clarke, 2009; Chrobot-Mason et al., 2001; Kitzinger, 2005).

Because of discriminatory and normative expectations, many LGBQ individuals struggle with accepting their identity, which can lead to early rejection of their identity and persistent feelings of discomfort surrounding the identity (Kinnish et al., 2005; Morgan, 2013). This struggle with being a member of the LGBQ community can impact the extent to which someone feels comfortable revealing their identity to others. Because of the historical and current stigma associated with this identity, particularly in certain geographic areas and within some religious groups, individuals may conceal their identity for fear of losing straight privilege, or the unearned and unchallenged advantage of appearing straight. Further, LGBQ individuals may also conceal their identity because they fear larger ramifications, such as losing a job or feeling physically unsafe (Chrobot-Mason et al., 2001; Goffman, 1986; Orlov and Allen, 2014; Quinn, 2006).

1.1 LGBQ Role Models and Mentors

The choice to “come out” or reveal one’s identity is a personal decision. However, LGBQ individuals employed in public occupations can impact not only their own lives but the lives of others when they choose to come out (Harbeck, 2014; Waldo and Kemp, 1997). While celebrities and pro sports athletes get the most attention for coming out (Iannucci, 2008; Sartore-Baldwin, 2012), anyone who is in the public eye can impact others when they reveal their LGBQ identity (Waldo and Kemp, 1997). Specifically, revealing one’s LGB identity has been shown to dispel homophobia by normalizing identities that are different from straight and cis-gender (Waldo and Kemp, 1997), and out LGBQ individuals can serve as role models to other members of the

*In this manuscript “LGBTQ” is used as an umbrella term that includes minority gender and sexual orientation identities. While the term specifically references lesbian, gay, bisexual, transgender, and queer identities, it is meant to be inclusive of any individual who does not identify as straight or cis-gendered. We recognize that each identity is unique and individual experiences are different; however, we use the term LGBTQ to recognize the community as a whole. We retain the acronyms used by other researches when discussing a specific study (e.g., LGB, LGBT). Throughout the text, we use the term LGBQ when we refer to our interviewees. There were no transgender individuals who participated in the interviews.*
LGBTQ community (Cooper and Brownell, 2016). Further, out LGBTQ individuals can develop professional mentoring relationships with others in the community who may be struggling with their identity. Therefore, while the decision to come out is personal, it has the potential to impact others in positive ways.

1.2 Do LGBTQ Instructors Reveal Their Identity to Students?

LGBTQ college instructors, particularly instructors of large courses, are positioned to impact significant numbers of students if they choose to reveal their identity in the classroom. While it is generally assumed that LGBTQ individuals may be underrepresented in the STEM workforce and in STEM academic positions, we know of no studies documenting this pattern (Cech, 2015; Patridge et al., 2014; Yoder and Mattheis, 2016). One reason that LGBTQ individuals may appear to be underrepresented in STEM could be the lack of LGBTQ individuals revealing their identity in STEM environments. There is evidence that it is perceived as irrelevant for LGBT individuals to share their identity in the scientific workplace (Bilimoria and Stewart, 2009; Fidas, 2015). In fact, scientists often choose not to be open about their LGBT identity (American Physical Society, 2016), and some scientists in the STEM workforce and in STEM academic positions have even felt the need to be perceived of as less obviously gay (Bilimoria and Stewart, 2009; Yoder and Mattheis, 2016).

To the best of our knowledge, no research explicitly explores the reasoning behind why LGBTQ college STEM instructors choose to come out or choose not to come out to their classes. LGBTQ students participating in an interview study about their experiences in an undergraduate biology classroom highlighted that they personally would benefit if an LGBTQ instructor were to come out to their class but expressed concern that other students could have negative perceptions of the instructor, talk about the instructor in a negative way, or provide negative feedback on teaching evaluations if an instructor revealed their LGBTQ identity to their biology class (Cooper and Brownell, 2016). Studies exploring the actual impact of coming out in class on instructors have demonstrated mixed results: one study showed that students in a college communication class perceived that a gay instructor was less credible than a straight instructor (Russ et al., 2002), but a different study found no detrimental effect on student evaluations when instructors disclosed their LGBT identities (Jennings, 2010). We are aware of only one study that explored why instructors chose to come out in class: an interview of 10 lesbian and queer female professors of English, women’s studies, philosophy, social work, nursing, athletic therapy, and communication and culture found that these professors chose to reveal their identities in class to show their genuineness and praxis toward social justice, which outweighed the perceived potential negative impacts of coming out in class (Nielsen and Alderson, 2014). In a national survey of LGBTQ individuals in STEM, participants were asked closed-ended questions about the extent to which they were out to their colleagues and students, the extent to which they felt safe in their workplace, whether their workplace was welcoming to LGBTQ individuals, whether they were treated the same as straight colleagues, and if their workplace was hostile. Researchers found that whether participants rated their workplace as welcoming and safe was significantly correlated with the extent to which they were out to their colleagues and to students (Yoder and Mattheis, 2016). While this prior research begins to provide some insight into instructor decision-making about coming out in class, more research is needed to understand what specific factors influence the decisions of instructors to come out or not come out, particularly in the context of college STEM classrooms.
1.3 LGBTQ Student Experiences in College Science

College has historically been a time where individuals start to explore their LGBT identity (Vacca, 2006). Although many college campuses are perceived to be accepting of LGBTQ individuals (College Choice, 2017; Campus Pride Index, 2018), STEM courses may present a particularly challenging environment for LGBTQ students. For example, faculty in chemistry, biology, math, and physics reported less positive attitudes toward LGBT issues compared to faculty in other disciplines such as anthropology, psychology, and sociology (Brown et al., 2004). Although heteronormativity is present across academic disciplines (Crew, 1978; LaSala et al., 2008; Liddle et al., 1998; Sears, 2002), STEM academic disciplines have been described as particularly heteronormative (Bilimoria and Stewart, 2009; Cech and Waidzunas, 2011). Further, two recent interview studies have reported that STEM students still have to contend with anti-LGBTQ discrimination; in one study, LGBTQ undergraduate students mentioned experiencing subtle forms of homophobia and more overt transphobia in their college biology classes (Cooper and Brownell, 2016), and in the other study, students reported experiencing LGBTQ discrimination in the larger STEM community (Linley et al., 2018). How does this academic climate affect LGBTQ students? This climate may negatively affect LGBTQ student retention in STEM; a recent large national study found that LGBQ students are 7% less likely than their heterosexual peers to be retained in STEM college degree programs (Hughes, 2018). While we do not know the underlying factors, the lower persistence of LGBTQ STEM students suggests that STEM instructors who reveal their LGBTQ identity to students in their classes may have a particularly positive impact on the experiences of LGBTQ students in STEM.

1.4 Using Expectancy Value Theory to Explore Instructor Decisions about Whether to Come Out to Students

The decision for college instructors to reveal their LGBTQ identities to their students can be explored through a psychological or a sociocultural perspective. Research on LGBTQ individuals often adopts a sociocultural perspective, which allows the researchers to consider an LGBTQ individual’s social and cultural circumstances and surroundings when exploring their experiences (Fassinger and Arsenneau, 2007; Fields et al., 2016; Shelton, 2015). However, in this study we chose to take a psychological perspective focused on understanding instructor behavior; we explored LGBTQ instructor decisions to come out to students by studying their motivation through the lens of expectancy value theory (EVT) (Fishbein and Ajzen, 1975). Expectancy value theory was originally proposed to predict an individual’s behavior by understanding their level of motivation (Fishbein and Ajzen, 1975). Notably, EVT has been championed as one of the most direct predictors of choice (Eccles, 1983; Eccles and Wigfield, 1995; Eccles et al., 1993) and assumes that an individual’s choice to engage in a specific task (such as coming out) is influenced by both negative and positive characteristics of the task (Eccles and Wigfield, 2002). EVT proposes that the extent to which one values a specific task and their expectation for whether they will be successful at a task influences their choice of whether to engage in the task (Wigfield et al., 2009). Specifically, Eccles (1983) outlined four components of task value that influence choice: (1) attainment value or the importance of completing a task, (2) intrinsic value or the enjoyment one gets from completing a task, (3) utility value or the usefulness of a task, and (4) the cost of completing a task. An individual’s perceptions of the task at hand are assumed to be informed by their past experiences with similar tasks, their per-
sonal beliefs, and historical events (Eccles and Wigfield, 2002). While expectancy value theory has historically been applied to choices to engage in achievement-related tasks (Cooper et al., 2017; Wigfield et al., 2009), we propose that EVT poses a useful lens to explore an LGBTQ individual’s choice about whether to come out in the context of a college classroom. Although coming out is an ongoing process, in this context, an instructor’s decision to come out to their class or not is a specific decision and task because they only have to come out to their class once. We hypothesize that the value that instructors personally place on coming out to students and the cost they perceive to coming out at their institution may influence whether they choose to share their LGBTQ identity with students in their classes.

2. METHODS

2.1 Current Research Study

In this study, we explore the extent to which LGBQ biology instructors come out to their students during class. We also examine LGBQ instructor decisions to come out or not to come out to their college biology classes. We assessed the extent to which LGBTQ instructors come out to their biology students using a national survey. To examine instructor rationale behind why they chose to come out or to not come out to their students, we took a qualitative approach using semi-structured interviews. These exploratory in-depth interviews allowed us to investigate instructor decision-making using a lens of EVT by identifying the costs and benefits of instructors revealing their LGBTQ identities in the classroom.

2.2 Survey and Interview Recruitment

We conducted a national search for college biology instructors who identify as members of the LGBTQ community using a convenience and snowball sampling approach. We sent recruitment emails out to listserves with possible LGBTQ biology instructors [e.g., Society for the Advancement of Biology Education Research (SABER); Ecolog; Out in Science, Technology, Engineering, and Mathematics (oSTEM)]. We invited college biology instructors who identify as members of the LGBTQ community to participate in a survey about their experience as an LGBTQ college biology instructor and we encouraged recipients of the recruitment email to share the survey with other LGBTQ biology instructors. On the survey we adapted questions from Patridge and colleagues’ (2014) measure of professional outness: we asked instructors to quantify the extent to which they have shared their identity (1) with their work colleagues and (2) in their undergraduate classrooms as 5 = out to everyone, 4 = out to most, 3 = out to some, 2 = out to a few, or 1 = not out at all. The last question on the survey asked participants if they were willing to participate in a follow-up interview to learn more about their experience as an LGBTQ biology instructor. Of the 60 instructors who participated in the survey, 27 instructors expressed interest in participating in interviews. We randomly selected instructors with a range of identities along the LGBTQ spectrum to interview, including instructors who identified as lesbian, gay, bisexual, queer, and asexual. Of note, no instructors who identified as transgender were willing to be interviewed and none of the instructors who responded to the survey identified as intersex. We use the term LGBQ as an inclusive term for the individuals that we interviewed to indicate that they belong to a community of people who do not identify as straight. We chose to interview LGBQ instructors until we reached data saturation and no
new themes were emerging from the interviews (Guest et al., 2006). We interviewed a total of 11 instructors.

### 2.3 Semistructured Interviews

In the summer of 2016, we conducted semistructured interviews with LGBQ college biology instructors over Skype. We developed interview questions to explore their experiences as LGBQ biology instructors broadly and to understand why they chose to come out or not come out to students in the college biology courses that they teach. We conducted three think aloud interviews with LGBQ instructors and iteratively revised the interview questions before doing the interviews for this study. Because LGBQ individuals are usually not asked to think about their LGBQ identities in the context of college biology classrooms, we provided interviewees with a short list of questions to consider a day before the interview (Cooper and Brownell, 2016). Interviews were recorded and transcribed. Participant names were replaced with pseudonyms to protect their identities.

Two authors (KMC and CG) used open-coding methods to review each transcript. They allowed ideas and themes to emerge from the interviews and wrote analytic notes during the reviewing of the transcripts (Strauss and Corbin, 1990). Quotes were assigned to a category and were continuously compared with each other to ensure that the description of a category was inclusive of all quotes and that quotes were not different enough from each other to warrant a separate category (Glaser et al., 1968; Glesne and Peshkin, 1992). The authors created a rubric describing each theme and one author (KMC) coded each interview for the presence of themes. To establish that the coding scheme was reliable, another author (SEB) coded 25% of the interviews for themes using the rubric. The results were compared and the authors had a consensus estimate of 96% (Stemler, 2004). Participants’ quotes were minimally edited by inserting ellipses to indicate excluded text. The authors used EVT as a lens when organizing the coded data; specifically, they categorized themes that emerged from the interviews as costs and benefits of instructors revealing their LGBQ identity in their college biology classrooms. The authors also conducted a member check by asking each participant to review quotes that were presented in the manuscript in context to ensure that the quotes were accurately representing the interviewee’s thoughts (Patton, 2005). To be conservative, we report themes that were mentioned by at least two LGBQ instructors.

This research was done in accordance with Gallaudet University IRB and assigned PJID #2713. All participants consented to this study.

### 3. RESULTS

#### 3.1 Demographics of Survey and Interview Participants

To be as inclusive as possible, we asked survey participants to describe their LGBTQ identity or identities in their own words. Thus, participants could identify with more than one identity. Of the 60 instructors who participated in the survey, 5 people identified as asexual, 15 people identified as bisexual, 22 people identified as gay, 17 people identified as lesbian, 2 people identified as pansexual, 9 people identified as queer, 1 person identified as bigender, 1 person identified as transmasculine, and 2 people identified as transgender. For each interview participant, we report their queer identity, their age range, whether they reveal their identity in front of their college biology class, their position, and their institution type (Table 1).
3.2 Finding 1: Over Half of Instructors are Out to Their Work Colleagues but Less Than 20% are Out to Students in Their College Biology Classes

Of the 60 LGBTQ instructors who responded to the survey, 56.6% reported that they were out to most or all of their work colleagues and only 10.0% reported that they were not out to any colleagues. Conversely, only 18.3% of instructors reported they were out to most or all of the undergraduate students in their biology classrooms and 65.0% reported that they were out to no students in their biology classrooms (Table 2). Of the 56.6% of instructors who were out to all or most of their colleagues, 47.1% indicated that they were not out to any or out to just a few

**TABLE 1: Demographics of interview participants**

<table>
<thead>
<tr>
<th>Instructor Pseudonym</th>
<th>Age Range</th>
<th>Self-Described LGBTQ Identity</th>
<th>Reveals Identity to Whole Biology Class</th>
<th>Position</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maggie</td>
<td>31–40</td>
<td>Lesbian</td>
<td>No</td>
<td>Adjunct professor</td>
<td>Public institution in the Southwest US</td>
</tr>
<tr>
<td>Matt</td>
<td>31–40</td>
<td>Gay</td>
<td>No</td>
<td>Assistant professor</td>
<td>Public institution in the Southeast US</td>
</tr>
<tr>
<td>Jeff</td>
<td>26–30</td>
<td>Gay</td>
<td>No</td>
<td>Associate lecturer</td>
<td>Public institution in the Midwest US</td>
</tr>
<tr>
<td>Claire</td>
<td>31–40</td>
<td>Asexual, Queer</td>
<td>No</td>
<td>Assistant professor</td>
<td>Private Christian institution in the US</td>
</tr>
<tr>
<td>Steve</td>
<td>31–40</td>
<td>Gay</td>
<td>No</td>
<td>Associate professor</td>
<td>Private Jesuit Catholic institution in the US</td>
</tr>
<tr>
<td>Ian</td>
<td>26–30</td>
<td>Gay Cis-Gendered Man</td>
<td>Yes</td>
<td>Assistant professor</td>
<td>Public institution in the Midwest US</td>
</tr>
<tr>
<td>Kim</td>
<td>51–60</td>
<td>Lesbian</td>
<td>Yes</td>
<td>professor</td>
<td>Public institution in the Southeast US</td>
</tr>
<tr>
<td>Lauren</td>
<td>31–40</td>
<td>Lesbian</td>
<td>Yes</td>
<td>Tenured faculty</td>
<td>Community college in the West US</td>
</tr>
<tr>
<td>Cory</td>
<td>31–40</td>
<td>Gay, Queer, Bisexual</td>
<td>Yes</td>
<td>Assistant professor</td>
<td>Private institution in the Northeast US</td>
</tr>
</tbody>
</table>
students in their college biology classes.

3.3 Finding 2: LGBQ Instructors Identify Both Costs and Benefits Associated with Coming Out to Students in Their Biology Classes

3.3.1 Potential Costs of Coming Out to Students in Class

From the interviews, we identified three distinct costs that instructors associated with revealing their LGBQ identity to students in biology classes. Two of the potential costs are costs for the instructors themselves, yet one potential cost for students in the class did emerge from the data. The specific participants who reported out each cost are shown in Table 3. The perceived costs are described and are supported by quotes in Table 4.

- **Instructor cost**: Students may have a negative opinion about LGBTQ people and therefore may develop a negative opinion of the instructor. Instructors mentioned that some students likely have negative opinions about people who identify as LGBTQ. Therefore, instructors reported that students may develop a negative opinion of an instructor who identifies as a member of the LGBTQ community.

- **Instructor cost**: Instructor could lose their job. Instructors stated that if students learn that an instructor is a member of the LGBQ community, then the student may report this to the administration in the form of a complaint. LGBQ instructors perceived that

<table>
<thead>
<tr>
<th>Stacy</th>
<th>41–50</th>
<th>Lesbian</th>
<th>Yes</th>
<th>Lecturer</th>
<th>Private Catholic institution in the US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean</td>
<td>31–40</td>
<td>Gay</td>
<td>Yes</td>
<td>Assistant professor</td>
<td>Community college in the Midwest US</td>
</tr>
</tbody>
</table>

*We report whether an institution is public, private, or a community college. We chose not to indicate the location of private Christian, Catholic, and Jesuit institutions to ensure participant anonymity.

<table>
<thead>
<tr>
<th>TABLE 1: (continued)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TABLE 2: Percent of instructors (n = 60) that are out to their colleagues and percent of instructors who are out to the students in their college biology classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out to work colleagues</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Out to students in the college biology classes they teach</td>
</tr>
</tbody>
</table>

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### TABLE 3: Costs and benefits of instructors revealing their LGBQ identities to a college biology class. ✓ indicates that an instructor mentioned a specific benefit or cost. Shaded boxes indicate that the instructor described personally experiencing a particular benefit or cost, or perceived that students experienced a particular benefit or cost, as a result of the instructor revealing their identity to at least one student.

<table>
<thead>
<tr>
<th>Instructor pseudonym</th>
<th>Reveals LGBQ identity to some undergraduate biology students</th>
<th>Reveals LGBQ identity to whole class</th>
<th>Costs of Coming Out</th>
<th>Reasons Why Coming Out to Students is Valuable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students may not have a positive opinion about LGBQ people</td>
<td>Instructor could lose job</td>
<td>Instructor lives authentically</td>
<td>Instructor is an example of a member of the LGBQ community to all students</td>
</tr>
<tr>
<td>Maggie</td>
<td>No</td>
<td>No</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Matt</td>
<td>No</td>
<td>No</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Jeff</td>
<td>Yes</td>
<td>No</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Claire</td>
<td>Yes</td>
<td>No</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Steve</td>
<td>Yes</td>
<td>No</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ian</td>
<td>Yes</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Kim</td>
<td>Yes</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Lauren</td>
<td>Yes</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cory</td>
<td>Yes</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stacy</td>
<td>Yes</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Dean</td>
<td>Yes</td>
<td>Yes</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
**TABLE 4:** Costs of instructors coming out to students in a biology class

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Specific Cost</th>
<th>Description</th>
<th>Example Quote</th>
<th>Example Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor cost</td>
<td>Students may have a negative opinion about LGBQ people and may develop a negative opinion of the instructor</td>
<td>Instructors describe that students may have a negative view of the LGBQ community and therefore, these students will have a negative view of an LGBQ instructor</td>
<td>Claire: “I’m very choosy about who I would tell because we’ve got some very close-minded students. They’re coming from very conservative, fundamental backgrounds, a lot of homeschool kids, where all they have is what church told them. You have to be very careful.”</td>
<td>Dean: “[I would tell an instructor to decide whether to come out] based on the students you have in your classroom, how well or not well you think that [coming out] will be perceived. If you don’t do that, you aren’t prepared for what might follow when you do come out.”</td>
</tr>
<tr>
<td>Instructor cost</td>
<td>Instructor could lose job</td>
<td>Instructors describe that if an instructor comes out to students in biology it could cause them to lose their job</td>
<td>Dean: “If coming out creates student complaints, and then I lose my job from it, then I’d be worried about it.”</td>
<td>Claire: “The atmosphere here is not supportive to anyone who’s not straight. You better be cisgender, you better be straight to fit in here (...) [If an instructor were to come out at my institution] they need to really think about the ramifications and the consequences because it could be really bad here. It’s so conservative that I’m not joking when I say I’m pretty sure I could be fired.”</td>
</tr>
<tr>
<td>Student cost</td>
<td>Time in class not spent on learning content</td>
<td>Instructors describe that sharing their LGBQ identity would be irrelevant in a biology class or would take away time that should be spent teaching content</td>
<td>Matt: “I don’t have to use class time to come out. I don’t know that that would be appropriate.”</td>
<td>Jeff: “I’m not explicitly outing myself to my students just because I don’t know that it’s necessarily pertinent in the classroom setting.”</td>
</tr>
</tbody>
</table>
at some institutions, especially those in conservative settings (e.g., schools in politically conservative regions or religiously affiliated schools), this could result in an instructor losing their job.

- **Student cost: Time in class is not spent on learning biology content.** Instructors discussed that coming out to students during class takes up class time that should be spent teaching biology content. They perceived that this could be a cost to revealing their identity, particularly if sharing their identity is not relevant to course content.

Interestingly, out instructors did not report perceiving negative opinions from students after coming out to their class. Further, none of the out instructors reported losing their job because of their affiliation with the LGBTQ community. This finding supports expectancy value theory, which predicts that instructors who are confident that they will not experience these costs are more willing to come out to their students. However, this does not mean that instructors who are not out to their students would have the same positive experiences revealing their LGBTQ identity to their students. It is possible that instructors who have made the decision to not reveal their identity to their students are more likely to experience the costs of coming out at their specific institutions. Alternatively, they may perceive the cost of coming out to be greater than it is, which influences them to not reveal their identity. It does not matter whether these costs are only perceived or if they are real; the perception alone of the cost is likely sufficient to affect whether someone is willing to come out.

One cost that emerged from the data was a potential cost for students: Instructors thought that it may be inappropriate to reveal their LGBTQ identity to students during class because it is unrelated to biology content and it would be taking up class time that should be used to teach content. Interestingly, some instructors still came out to students during class because they felt as though their LGBTQ identity was relevant to the biology content that they were teaching. Additionally, other instructors who reported that they came out to students in just a few seconds, such as when they introduced themselves to students on the first day of class, did not view the process of coming out as taking away from time that could have been spent teaching content. Thus, how and when an instructor chooses to come out to students could determine the extent to which they perceive that coming out results in lost class time.

### 3.3.2 Potential Benefits of Coming Out to Students in Class

Instructors identified a number of benefits that could result from revealing their LGBTQ identity to students in their biology classes. All but one of these benefits were perceived to positively impact students and one benefit was specific to instructors. The individual participants who reported and experienced each of these benefits are shown in Table 3. The benefits are described and are supported by quotes in Table 5.

- **Instructor benefit: Instructor is happier when living most authentically.** Instructors mentioned that a reason for revealing their identity was to live authentically. Several instructors talked about how being LGBTQ is an integral part of who they are and thus, being out to their class made them feel happier than concealing their identity. Instructors also highlighted the negative impact of hiding their identity: that not being out about one’s LGBTQ identity, or being closeted, could negatively affect their personal well-being.
• **Student benefit: Instructor is an example of a member of the LGBTQ community to all students.** Instructors highlighted that out LGBTQ instructors can help all students, not only LGBTQ students, realize that someone can be a member of the LGBTQ community and still be a “normal person,” a successful scientist, and a biology instructor. Thus, out LGBTQ instructors can provide students with a personal role model of an LGBTQ individual in science and help normalize the existence of LGBTQ individuals in society.

• **Student benefit: Instructor serves as a mentor specifically to LGBTQ students.** Instructors highlighted that out LGBTQ instructors can serve as mentors for LGBTQ students by building lasting relationships with individual students, supporting them through the coming out process, and helping them navigate the biology community as an LGBTQ person.

• **Student benefit: Instructor becomes a known supporter of the LGBTQ community.** Instructors said that coming out can provide LGBTQ students with an ally in the classroom, someone who would stand up for them if they were bullied by other students, or someone who would be rooting for them to succeed in their endeavors.

• **Student benefit: Students find the instructor more relatable.** Instructors stated that all students may be able to better relate to out LGBTQ instructors because they recognize the instructor as someone who has perhaps experienced difficulties because they are part of a marginalized community. Further, instructors highlighted that LGBTQ students may be especially likely to find an out instructor more relatable because LGBTQ students likely share and understand some of the same struggles that can come with being LGBTQ.

• **Student benefit: Students feel more comfortable in class.** Instructors mentioned that LGBTQ students can feel more welcome, safe, or comfortable in class by simply knowing that their instructor is also a member of the LGBTQ community, even if that instructor does not do anything actively to support LGBTQ students.

All instructors who were out to their biology classes reported that they or their students experienced at least one benefit because they revealed their LGBTQ identity to the entire class. Instructors who described that their students benefited from their coming out all described in instances where students explicitly told them that they had benefited in a particular way as a result of the instructor coming out. Applying expectancy value theory, the benefits to students can be classified as utility values that instructors associate with coming out because instructors consider the act of coming out in class to be useful to their students.

Instructors who were not out to their biology classes recognized potential benefits to students, but only one instructor described experiencing some of the benefits. This was because she came out to students individually during office hours but was not out to the whole class; the students who she came out to individually had described some of the benefits of knowing an out instructor. Interestingly, none of the instructors who were not out to their classes identified that coming out could make them happier because they would be living more authentically, which has been previously shown to be an important reason that college instructors reveal their lesbian and queer identities (Neilson and Aldrich, 2014). Using expectancy value theory, this would be considered an intrinsic value because it describes the freedom that an individual gets from coming out to students (Wigfield et al., 2009).
<table>
<thead>
<tr>
<th>Type of Benefit</th>
<th>Specific Benefit</th>
<th>Description</th>
<th>Example Quote</th>
<th>Example Quote</th>
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</thead>
<tbody>
<tr>
<td>Instructor benefit</td>
<td>Instructor is happier when living most authentically</td>
<td>Instructors describe feeling happier or healthier when being open and honest with students about being a member of the LGBTQ community</td>
<td>Lauren: “For me personally, I need to feel like I’m living my most authentic life, because that’s how I’m happiest and I think that’s an important part of the human condition.”</td>
<td>Cory: “Closeting yourself is not something that I take lightly, because it’s hard and it can cause damage to you, and I don’t think that it’s good. Especially if you’ve already been out.”</td>
</tr>
<tr>
<td>Student benefit</td>
<td>Instructor is an example of a member of the LGBTQ community to all students</td>
<td>Instructors describe being an example of a member of the LGBTQ community for all students and helping students realize that biology instructors can also identify as LGBTQ</td>
<td>Cory: “I mentioned that I was gay when talking about sociobiology. I had a couple students email me afterwards who said ‘You’re the first gay professor that I’ve heard of. I’ve never had a class from a gay professor. Thank you for coming out.’ First of all, I was shocked that they had not had a gay professor at that point. It’s likely that they did, but that professor just never said so. That just reinforces for me that this is something that’s important for me to do.”</td>
<td>Lauren: “It was important for me to have my students have someone in their life that they experience who they see as not only their biology professor who is passionate about her job and good at her job I think, but as someone who is living as a lesbian and that they knew that was a normal thing to be doing.”</td>
</tr>
<tr>
<td>Student benefit</td>
<td>Instructor serves as a mentor to LGBQ students</td>
<td>Instructors describe mentoring LGBQ students by talking about their shared experiences as members of the LGBTQ community</td>
<td>Ian: “I have had several students who are LGBT and also who are science majors. They realize, ‘Finally, we found one [another LGBTQ person in science].’ (...) We’ve talked one-on-one about what it’s like going to graduate school when you’re one of three gay people in your cohort. I’ve been trying to do that in an informal capacity.”</td>
<td>Maggie: “If I were in college and searching for help, or searching for someone to talk to, I would want somebody to say, ‘Yes, that’s great, and I am [gay], too. Let’s talk about it.’ I feel like it would be nice to have somebody to talk to and to be that person for students. Almost to let them know that I’ve made it through. I’m fine, I’ve excelled and I’ve done great, even though it’s hard and difficult sometimes.”</td>
</tr>
</tbody>
</table>
Instructor becomes a known supporter of the LGBTQ community

| Student benefit | Instructor describes coming out so that LGBTQ students know that they have an ally, someone on their side, or someone who would defend them | Matt: “If I did [come out] it would be either innocently [meaning in passing by mentioning a partner] or as a way to let other people know that if they are gay or lesbian or transgender, bisexual, whatever, that I’m their ally.” | Dean: “I would want someone who is struggling to know that they have someone in their box, and someone who wants to see them get through it and discover themselves in a positive way.” |

Students find instructor more relatable

| Student benefit | Instructors describe that coming out may cause them to seem more relatable or more human to students | Dean: “When I made [coming out] about the struggles that I faced, it made a huge difference for my students. A lot of them assumed, ‘Well, you probably just had the easiest life, and whatever you did you just cruised through. You were 27 when you got your PhD, fancy schmancy.’ [It made a difference] to talk about the depression and anxiety I had when I was in the closet.” | Jeff: “I think it might just provide being more relatable to students who are in the community. They probably know or could assume that I’ve been in similar situations that they’ve been in. If they’re a member of the community, just kind of providing a little bit more of that relatability to a professor and maybe eases the student/instructor tension a little bit.” |

Students feel more comfortable in class

| Student benefit | Instructors describe coming out to help students feel safer or more comfortable in the classroom | Stacy: “I had one student come to me during that first week and she just said she felt safer in the classroom.” | Lauren: “I think [coming out] opens the door to letting my students, some of my students, feel comfortable.” |
3.4 Finding 3: Compared to Instructors Who Are Not Out, Out Instructors Tend to Perceive Fewer Costs and Greater Value to Coming Out to Students in Class

We recorded which costs and benefits were mentioned by each instructor in Table 3 and shaded costs and benefits that instructors or students had actually experienced from either an instructor coming out to students in their class or coming out to students one-on-one.

3.4.1 Out Instructors Perceived High Value and Low Cost to Coming Out

As expectancy value theory predicts, the decision to come out to students seemed to be driven by high value and low cost. That is, most out instructors identified multiple reasons as to why coming out to students was valuable and explained that they conceptualized relatively little cost to coming out. While these instructors often recognized that students might have a negative reaction to them coming out, they were not necessarily concerned about students’ reactions and once they were out, they did not experience any situations that led them to believe that students had developed a negative opinion of them because of their LGBQ identity. Further, only one of the instructors who was out to his class, Dean, mentioned that if coming out would result in him losing his job then he would be concerned about coming out, but he also said that this was unlikely to happen at his institution. Conversely, Claire, an assistant professor at a private Christian institution who was not out as asexual, queer, or a member of the LGBQ community to her whole class, was confident that she would likely lose her job if she revealed her identity to her students and her institution found out. Claire was aware of her institution’s overtly negative views of LGBT identities and was confident that she would be fired because she holds an identity within the LGBTQ spectrum. Though Claire placed very high value on coming out to students, especially at an institution with particularly negative views of LGBQ people, the high cost of losing her job solidified her decision to conceal her asexual identity from her whole class.

3.4.2 Most Instructors Who Were Not Out to Students Perceived a Low Value and Low Cost to Coming Out

For the other instructors, besides Claire, who were not out to their classes, the decision to conceal their LGBQ identities in class did not seem to be driven by cost, but instead seemed to be driven by the lack of value they placed on coming out to students. Prior to the interviews, it seemed that most of these instructors had not considered how coming out in class could impact their students. This is illustrated by Steve.

Interviewer: “Do you think that coming out in your classroom would influence the students in your classes?”

Steve: “You know, I don’t know. I haven’t thought about it until I saw your question. I think I do avoid [coming out to students] and I hadn’t really said that to myself before.”

While these instructors ultimately identified some benefits to students, they seemed to be coming up with the benefits in real time in response to our questions and had not previously thought about the possible value of coming out to students in their classes. This was in contrast to out instructors who seemed to have thought deeply about their decision to come out in class.
and perceived that coming out was valuable either to them or to their students. Expectancy value theory suggests that if these instructors who were not out were to think more about how coming out would impact students and in turn perceived a value in coming out to students, then they might be willing to come out in their future biology classes, especially if they do not perceive any costs. This was illustrated in an interview with one instructor who was not out to students in his biology classes, but during the interview he identified why instructors coming out to students could benefit them. Later in the interview, he was asked whether he would come out if he knew that students would benefit and he explained that he likely would.

*Interviewer:* Talk to me about whether you come out to any of your students in any of your courses.

*Matt:* I don’t. I don’t make it a point of saying anything about my personal life.

Later in the interview, after identifying some benefits to students, Matt considered that he might come out if it would help students.

*Interviewer:* If you knew that it would benefit students to come out in the classroom, do you think you would do it?

*Matt:* Yeah. I would but it wouldn’t benefit everybody, right? But yeah. If I knew it would help certain students, I might raise it in a way that was not alienating of any one student.

This lack of conceptualizing the benefits associated with coming out to students is not surprising given the historical context of this identity; because this identity is associated with sexual attraction, it is often perceived as something too personal to reveal. In fact, a prior study with LG-BTQ students who were asked whether they would want their instructors to come out indicated that they felt as though it might be inappropriate for an instructor to share their LGBTQ identity, even though they acknowledged that they were hypocritical and did not feel the same way when straight instructors talked about their spouses (Cooper and Brownell, 2016). If the assumption is that one’s LGBTQ identity is too personal to share, then this could explain why instructors may not consider the possible benefits of revealing their identity.

4. DISCUSSION

To our knowledge, this is the first study to explore the extent to which instructors reveal their LGBTQ identities to students in college biology classes and to identify factors that influence LGBQ instructor decisions about coming out to their undergraduate science classes. Given the reputation for academic science environments to be heteronormative (Bilimoria and Stewart, 2009), the findings that LGBTQ students experience anti-LGBTQ discrimination in their STEM courses (Cooper and Brownell, 2016; Linley et al., 2018), and the lower persistence rates of LGBQ students in STEM compared to their straight counterparts (Hughes, 2018), the reasoning behind why instructors choose to come out or not to come out in class is especially relevant within the context of a STEM discipline such as biology.

The results of this study indicate that while many LGBQ individuals may be out to their colleagues in biology, it is not as common for instructors to come out to their biology classes. We found that over half (56.6%) of the biology instructors that we surveyed were out to all or most
of their colleagues. This is in contrast to a previous study with data collected in 2010 from 59 LGBQ faculty across STEM disciplines, which found that only 28% of instructors reported that they were out to all or most of their colleagues in their professional environment (Patridge et al., 2014). We perceive that this difference is likely reflective of the national movement toward an increased acceptance of LGBQ individuals between 2010, when the data were collected for the study by Patridge and colleagues, and 2016, when data were collected for this study. Interestingly, while this national movement toward greater acceptance of LGBQ individuals may have positively influenced instructor willingness to come out to their STEM colleagues, it seems as though it may have not had such an impact on instructors’ willingness to come out to students in their classes since only 18.3% of instructors in this study reported that they were out to all or most of the students in their biology classes.

4.1 Decreasing the Cost and Emphasizing the Value of Instructors Coming Out to Students in Their Classes

Coming out is a deeply personal decision, especially coming out to students publicly in a work environment. Thus, we do not assert that all LGBTQ instructors should come out to their classes. However, given the previously identified potential benefits of coming out to students, including allowing instructors to live more authentically (Nielsen and Alderson, 2014), challenging the assumption that all scientists are straight (Bilimoria and Stewart, 2009), and providing students with more LGBTQ role models (Cooper and Brownell, 2016), as well as the additional potential benefits identified in this study, we argue that it is important to identify factors that enhance instructors’ comfort and willingness to come out in their college classes. In this study, we found that instructors’ decisions about whether to reveal their LGBQ identity in the context of their college biology classes were driven by two factors: the value that they placed on coming out to students and the potential cost that they associated with coming out to students in their classes. However, one of the most striking findings that emerged from our study is that it is not sufficient for instructors to only perceive low costs to come out; they also need to perceive benefits. Therefore, although one way to increase instructor willingness to come out to their whole class is to decrease the costs associated with coming out, expectancy value theory suggests that this cost must be evaluated in relation to the perceived benefits of coming out. Some of the instructors in this study who were not out to their students already perceived low costs to coming out but did not seem to have considered the potential value.

One potential cost that instructors of this study associated with coming out to their classes was that students could complain to administration and the instructor could lose their job. This is an important concern for LGBTQ individuals. As of 2017, there were 28 states in which one could be fired for being lesbian, bisexual, or gay and 30 states in which one could be fired for being transgender (Out & Equal Workplace Advocates, 2017). Despite the lack of legal protection for LGBTQ people in the workplace, many institutions have adopted antidiscrimination statements (e.g., Tufts University, 2019), yet sometimes there is a disconnect between general statements about discrimination and one’s perception of the inclusiveness of an institution or department. Biology departments interested in creating more inclusive environments for LGBTQ-identifying employees could issue their own explicit statement on inclusion and fair treatment of LGBTQ people and be transparent about their stance on workplace nondiscrimination policies and other legislation (American Physical Society, 2016). However, even if a university has a nondiscrimination policy in place, if members of the university or department administration are
not explicit about their support of the statement, LGBTQ individuals may still feel uncomfortable revealing their identity. To combat this perception, institutions can create a more visibly supportive environment for LGBTQ instructors and students by encouraging all employees to complete Safe Zone workshops or other certifications that encourage LGBTQ awareness and support for LGBTQ students (Safe Zone Project, 2018). Further, another resource is the American Physical Society’s LGBT Climate in Physics, which has outlined six broad recommendations and specific actions for how to create more inclusive and supportive environments for scientists (American Physical Society, 2016).

Instructors who were not out to their classes seemed to perceive less value in coming out to the students in their class. That is, they were sometimes less likely to articulate reasons why coming out in class may positively affect students, and some instructors had not considered the potential benefits of coming out to students prior to participating in this study. This could in part be due to the lack of research, and consequently lack of general knowledge, focusing on how instructors coming out as members of the LGBTQ community could positively influence LGBTQ students in STEM. Until recently, there have been no studies that have articulated how instructors coming out could positively impact students. However, work from our research group found that students would feel more comfortable in a classroom where they knew the instructor identified as LGBTQ (Cooper and Brownell, 2016), and in a recent study by Linley and colleagues, one STEM student described that knowing out instructors can be pivotal to students’ success and retention (Linley et al., 2018). This echoes research done on other underrepresented and underserved identities in STEM, where the presence of a role model who shares a specific identity with students can help students feel more included in the discipline and positively impact their sense of empowerment and professionalism (Barnes et al., 2017; Handelsman et al., 2005; Leggon, 2010; Stout et al., 2011). While these previous studies and the results of this interview study indicate that the act of instructors revealing LGBTQ identities has the potential to positively impact undergraduates, the impact of instructors coming out to students needs to be studied more systematically and in larger scale studies.

4.2 How Can All Biology Instructors Make Their Classrooms More Inclusive for LGBTQ Students?

This study highlights ways in which any instructor, regardless of whether they identify as a member of the LGBTQ community, can potentially create an inclusive classroom for LGBTQ students. For example, one of the benefits of coming out to students that instructors highlighted was that instructors could become known supporters of the LGBTQ community. Any instructor can become a known supporter of LGBTQ students by making a statement about their support of the LGBTQ community at the beginning of class, including a statement on their syllabus, or posting a statement or supportive sticker outside their office door. In fact, STEM college students who identify as members of the LGBTQ community have described the importance of meeting faculty who are open and accepting of their LGBTQ identities, but few students have reported interacting with faculty who were “out” as allies of the LGBTQ community (Linley et al., 2018).

5. LIMITATIONS

This study is vulnerable to volunteer bias because the instructors who participated in this study chose to respond to the national survey about LGBQ instructors in biology and further volun-
teered to be interviewed about their experience as an LGBQ instructor in biology. Thus, these instructors may be more comfortable with their LGBTQ identities than instructors who were unwilling to fill out the survey. However, even with this bias, we still captured a diversity of self-reported behaviors as far as coming out to their undergraduate biology classes. Another limitation is the sample size of 11 instructors, each of whom is from a unique institution in a distinct region of the country. Thus, it is not possible to disaggregate the experiences of the individuals from their specific context. Further, the majority of the instructors that we interviewed were white, so unfortunately, we were unable to explore issues of intersectionality between race/ethnicity and LGBQ identity in a meaningful way. Additionally, we were not able to recruit any transgender individuals for the interviews, so we cannot comment directly on the experiences of transgender biology instructors. However, we do believe that some of these findings may be applicable to transgender individuals because they are members of the broader LGBTQ community. Lastly, instructors reported potential ways in which coming out in class could benefit students in biology, but further studies need to be conducted to confirm their perceptions of student benefit.

6. CONCLUSIONS

LGBQ instructors identified both costs and benefits to coming out to students in the context of their college biology classes. Instructors who were out to their classes tended to place more value on coming out in class and perceive that they would experience fewer costs than instructors who were not out to their students. Using expectancy value theory, we would predict that to encourage more LGBQ instructors to come out to their classes, they need to perceive few costs but also perceive substantial benefits.

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