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Differences in Sexual Orientation Diversity and Sexual Fluidity in Attractions among Gender Minority Adults in Massachusetts

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Abstract

This study characterized sexual orientation identities and sexual fluidity in attractions in a community-based sample of self-identified transgender and gender nonconforming adults in Massachusetts. Participants were recruited in 2013 using bi-model methods (online and in-person) to complete a one-time web-based quantitative survey that included questions about sexual orientation identity and sexual fluidity. Multivariable logistic regression models estimated Adjusted Risk Ratios (aRR) and 95% Confidence Intervals (95% CI) to examine the correlates of self-reported changes in attractions ever in lifetime among the whole sample ($n=452$) and after transition among those who reported social gender transition ($n=205$). The sample endorsed diverse sexual orientation identities: 42.7% queer, 19.0% other non-binary, 15.7% bisexual, 12.2% straight, 10.4% gay/lesbian. Overall, 58.2% reported having experienced changes in sexual attractions in their lifetime. In adjusted models, trans masculine individuals were more likely than trans feminine individuals to report sexual fluidity in their lifetime (aRR=1.69; 95% CI=1.34, 2.12). Among those who transitioned, 64.6% reported a change in attractions post-transition and trans masculine individuals were less likely than trans feminine individuals to report sexual fluidity (aRR=0.44; 95% CI=0.28, 0.69). Heterogeneity of sexual orientation identities and sexual fluidity in attractions are the norm rather than the exception among gender minority people.

Keywords

gender minority; transgender; gender nonconforming; sexual orientation identity; sexual fluidity

Everyone develops a sexual orientation as part of general identity development. Although traditional conceptualizations and theory of sexual orientation development propose that it is stable after initial formation in early adolescence (Bell, Weinberg, & Hammersmith, 1981;

Money, 1988), more recent research suggests that sexual orientation is fluid for some individuals (Diamond, 2008a; 2008b; Dickson, Paul, & Herbison, 2003; Katz-Wise, 2015; Kinnish, Strassberg, & Turner, 2005; Ott, Corliss, Wypij, Rosario, & Austin, 2011). One limitation of previous research on sexual fluidity is that samples have largely been limited to cisgender (non-transgender) individuals. Considering that sexual orientation is determined based on gender, for instance, same-gender vs. other-gender attraction, there is reason to believe that describing sexual orientation may be more complicated for gender minority (transgender and gender nonconforming) individuals who may be transitioning from one gender to another or who identify with diverse gender identities and expressions not consistent with their sex assigned at birth. It is important to understand sexual orientation among gender minority individuals because any degree of membership in a gender minority group may result in increased minority stress and associated negative health outcomes (Bockting, Miner, Swinburne Romine, Hamilton, & Coleman, 2013; Hendricks & Testa, 2012; Meyer, 2003; Reisner, Greytak, Parsons, & Ybarra, 2015). The aim of this study was to characterize sexual orientation identities and sexual fluidity in attractions in a community-based sample of self-identified transgender and gender nonconforming adults, including examining gender differences and associated factors.

In this research, we distinguish between *sex* and *gender* as follows: *sex* refers to a person's characterization as female or male at birth, typically based on the appearance of external genitalia or other biological characteristics including chromosomes, whereas *gender* refers to social characteristics that may be aligned with a person's sex and adopted by an individual as their *gender identity*. We use gender broadly to include gender identity and gender expression, in that gender forms the basis for sexual orientation (e.g., same-gender vs. other-gender attractions). We define *gender minority* as including both *transgender* and *gender nonconforming* individuals. *Transgender* individuals identify with a different gender from their sex assigned at birth and typically undergo some form of social gender transitioning and may also undergo some form of medical gender transition in the form of gender affirmative medical treatments (e.g., hormones, surgeries). *Gender nonconforming* individuals have an external gender expression that is different from cultural expectations based on their sex assigned at birth, but may use the gender identity label associated with their assigned birth sex or another diverse gender identity label. We further define *trans masculine* individuals as those who were assigned a female sex at birth and now identify as men or are on the trans masculine spectrum in terms of their gender identity or gender expression. We define *trans feminine* individuals as those who were assigned a male sex at birth and now identify as women or are on the trans feminine spectrum in terms of their gender identity or gender expression. The terms trans masculine and trans feminine are understood by transgender individuals to include those who identify as genderqueer and other nonbinary gender identities (Reisner, Gamarel, Dunham, Hopwood, & Hwahng, 2013; "Transmasculine", 2013). These individuals may be accessing hormones to masculinize or feminize their bodies, but may not label themselves using binary gender identity labels (i.e., woman or man).

We conceptualize sexual orientation as comprising multiple components, including romantic and sexual attractions, sexual orientation identity, and sexual behavior (Institute of

Medicine, 2011; Klein, Sepekoff, & Wolf, 1985; Rosario & Schrimshaw, 2014). The basis for sexual orientation – sexual or romantic object choice – is problematized and called into question in light of transgender individuals for whom sex assigned at birth and current gender identity do not match (Drechsler, 2003; Stryker, 2006). Thus for gender minority individuals, complexity exists in the relationship between gender identity and specific components of sexual orientation. In part, this complexity is due to a shifting point of reference with which to define sexual orientation (i.e., depending on gender identity). For example, a transgender woman who is sexually attracted to women may identify as *heterosexual* before coming out as transgender and *lesbian* after, assuming her romantic and/or sexual attractions remain stable.

Research on sexual orientation among gender minority individuals has supported the notion of complexity in the relationship between gender identity and specific components of sexual orientation. A study of sexual orientation identity development among trans masculine individuals found that individuals placed weight on different factors related to their sexual orientation identity (e.g., sexual attractions, physical body, sexual behaviors) at different times during their gender transition in an attempt to accurately describe their sexual orientation identity (Devor, 1993). In particular, the relationship between gender identity and romantic or sexual attraction and between gender identity and sexual orientation identity is not clear cut. Regardless of how a gender minority person identifies their gender, there is diversity in the directionality of their attractions and in how they identify their sexual orientation (Dargie, Blair, Pukall, & Coyle, 2014; Diamond, Pardo, & Butterworth, 2011; Hines, 2007; Kuper, Nussbaum, & Mustanski, 2012; Meier, Pardo, Labuski, & Babcock, 2013). Some research has suggested that sexual orientation identities that do not exclusively reflect same- or other-gender orientation (e.g., bisexual, queer) are common among gender minority individuals (Kuper et al., 2012; Meier et al., 2013). The use of such identities acknowledges the inherent complexity in describing sexual orientation among gender minority individuals. Unfortunately, the majority of research on sexual orientation of transgender individuals has not included *queer* as a response option. The current study assessed a wide range of sexual orientation identities, including both bisexual and queer.

In addition to diversity in sexual orientation components among gender minority individuals, there is also diversity in the stability of sexual orientation across time. In this research, we define *sexual fluidity* as change over time in one or more components of sexual orientation (Diamond, 2008b; Katz-Wise, 2015); for instance, having same-gender attractions only and then having attractions to more than one gender, or identifying as lesbian/gay and then later identifying as bisexual. Sexual fluidity has been understood by some researchers to be a property of sexuality that is held to some degree by all individuals, regardless of sexual orientation (Blumstein & Schwartz, 1990; Weinberg, Williams, & Pryor, 1994). Indeed, a number of studies have documented experiences of sexual fluidity among both sexual minorities and heterosexuals, and among both females and males (Diamond, 2008b; Dickson et al., 2003; Katz-Wise, 2015; Ott et al., 2011; Rust, 1993; Savin-Williams, Joyner, & Rieger, 2012; Weinberg et al., 1994). Some researchers have proposed that sexual fluidity is more prevalent in females than in males (e.g., Baumeister, 2000; Diamond, 2008a; Peplau & Garnets, 2000). This proposition has been supported by some research (Dickson et

al., 2003; Kinnish et al., 2005; Savin-Williams et al., 2012), but other research has found no gender difference in sexual fluidity among sexual minorities (Ott et al., 2011; Katz-Wise, 2015) or greater sexual fluidity among males than females (Rosario, Schrimshaw, Hunter, & Braun, 2006).

To our knowledge, only a few studies have directly examined sexual fluidity among gender minority individuals, independently from cisgender individuals. Results from one U.S. study indicated that trans feminine individuals experienced a change in attractions from female-only to male-only attractions during the course of gender transitioning (Daskalos, 1998). A Dutch study of trans masculine individuals indicated change toward male-only attractions or bisexual attractions during the process of gender transitioning (Coleman, Bockting, & Gooren, 1998). Both of these studies had small samples (i.e., 20 individuals). A larger international (primarily U.S.) study of more than 600 self-identified trans masculine individuals found that 40% of the sample retrospectively self-reported change in sexual attractions during the process of gender transitioning (Meier et al., 2013). However, only one study compared experiences of sexual fluidity between trans feminine and trans masculine individuals. This German study examined changes in self-reported sexual orientation among a clinical sample of 115 trans feminine and trans masculine individuals, finding no significant gender difference in sexual fluidity in attractions between the groups (Auer, Fuss, Höhne, Stalla, & Sievers, 2014). It is clear that more research is needed to identify the prevalence of sexual fluidity in both trans feminine and trans masculine individuals in the United States.

Sexual fluidity among gender minority individuals may be related to other factors, such as medical gender transition. Some individuals have reported experiencing changes in the directionality of their attractions following cross-sex hormone treatment (Auer et al., 2014; Devor, 1993; Meier et al., 2013), suggesting that hormones (especially testosterone) may play a role in sexual fluidity among gender minority individuals. Other research has found sexual fluidity in attractions following gender affirming surgeries (Daskalos, 1998), although one study found that a substantial percentage of individuals reporting sexual fluidity in attractions (39% of trans feminine individuals and 60% of trans masculine individuals) reported a change in sexual attraction prior to undergoing any gender affirming surgeries (Auer et al., 2014). Gender affirming surgeries that improve congruence between an individual's body and their gender identity may prompt shifts in attractions or sexual orientation identity if a particular orientation is more in line with an individual's conception of gender. For instance, an individual who transitions from female to male may adopt a heterosexual sexual orientation identity following gender transition, because it is consistent with societal notions of masculinity (Connell, 1995), even if that person was previously identified as lesbian.

Sexual fluidity may also be related to the use of binary (e.g., trans feminine or trans masculine) vs. non-binary (e.g., genderqueer) gender identities. For individuals with binary identities, sexual orientation identity may change during gender transition as their gender identity, the point of reference for identifying sexual orientation, shifts. For instance, a gender minority individual who was assigned a male sex at birth and initially had a male gender identity and gay sexual orientation identity may later identify as female and

heterosexual, assuming they have not experienced a change in the directionality of their attractions; i.e., they remain attracted to men. Similarly, an individual who was assigned female at birth with an initial female gender identity and lesbian sexual orientation identity may later identify as bisexual or queer if their attractions shift to include men or trans masculine individuals. For individuals with non-binary identities, similar changes may occur based on whether their own gender identity shifts along the spectrum between feminine and masculine. Other individuals may experience no change in their attractions or sexual orientation identity during the process of gender transition.

The aim of this study was to characterize sexual orientation identities and sexual fluidity in attractions in a community-based sample of transgender and gender nonconforming adults in the U.S. state of Massachusetts, including examining gender differences. We hypothesized that trans masculine individuals would be more likely to report sexual fluidity than trans feminine individuals, that sexual minority individuals would be more likely than heterosexuals to report sexual fluidity, and that individuals who reported a medical transition would be more likely to report sexual fluidity than individuals who had not transitioned. A secondary aim of this study was to explore factors related to sexual orientation identity and sexual fluidity in attractions among gender minority adults. Considering the exploratory nature of our second aim, we did not have a specific hypothesis about the associations between these factors and sexual fluidity.

Method

Participants

Participants were 452 self-identified transgender and gender nonconforming adults, ages 18–75 years. A community-based convenience sample of Massachusetts residents was purposively recruited from August to December 2013 for Project VOICE, a collaboration between The Fenway Institute at Fenway Health (TFI) and the Massachusetts Transgender Political Coalition (MTPC). Participants were recruited using bi-modal methods (online and in-person). Eligible respondents were age 18 years or older, self-identified as transgender or gender nonconforming, lived in Massachusetts for at least 3 months in the past year, and had the ability to read/write at the 5th grade level or higher in either English or Spanish. Detailed information on recruitment methods can be found elsewhere (Reisner, White et al., 2014).

Measures – Statistical Predictors

Gender identity—Gender identity was assessed using a two-step method (Reisner, Biello et al., 2014) with two items: (1) assigned sex at birth (*female, male*) and (2) current gender identity (*man, woman, female-to-male (FTM)/trans man, male-to-female (MTF)/trans woman, genderqueer, gender variant, gender nonconforming, other*). The two items were cross-tabulated to categorize participants as trans feminine ($n=167$) or trans masculine ($n=285$) according to assigned sex at birth. Participants were additionally categorized as having a binary gender identity (*man/FTM/trans man, woman/MTF/trans woman*) or a non-binary gender identity (*genderqueer, gender variant, gender nonconforming*), based on their response to the current gender identity item. Participants were also asked a separate question to assess whether they had ever been diagnosed with a medically-recognized intersex

condition. Overall, 4.4% (20/452) indicated an intersex diagnosis (12 had been assigned a male sex at birth, 8 had been assigned a female sex at birth).

Sexual orientation identity—Sexual orientation identity was assessed with the following item, “How do you currently identify your sexual orientation?” (*straight/heterosexual, gay/lesbian/same-gender attracted, bisexual, queer, questioning, I do not label my sexual orientation, unsure, asexual, other*). This item was recoded into the following groups for the current analysis: *straight, gay/lesbian, bisexual, queer, and other/non-binary*, which included *questioning, I do not label my sexual orientation, unsure, asexual, and other*.

Visual gender nonconformity—Visual gender nonconformity was assessed with the following item, “People can tell I’m transgender or gender nonconforming even if I don’t tell them.” This item was assessed on a 5-point Likert scale from 0 (*never*) to 4 (*always*). The item was recoded into *low (never or occasionally), moderate (sometimes), high (mostly of the time or always) visual gender nonconformity*.

Social gender transition—Social gender transition was assessed with the following item used previously in transgender health research (Xavier, Honnold, Bradford, & Community Health Research Initiative, 2007), “Do you consistently present (live ‘full-time’) in your identified gender?” (*yes, no*).

Medical gender affirmation—Medical gender affirmation was assessed with the following item used in prior research with transgender adults (Reisner, Conron et al., 2014), “Have you accessed any transgender-related medical interventions to affirm your gender (e.g., hormones, surgeries)?” (*yes, no*).

Race/ethnicity—Race and ethnicity were assessed separately and combined into the following groups: *white non-Hispanic, black non-Hispanic, Hispanic/Latino, other race/ethnicity non-Hispanic, multiracial non-Hispanic*.

Survey mode—Survey mode was assessed as *online* vs. *in-person*.

Development—Current age in years (continuous) was assessed. Age in years (continuous) of first awareness of transgender status was assessed with the following item, “How old were you when you first became aware that you were transgender or gender nonconforming?”

Socioeconomic status (SES)—Perceived income/class was assessed on a 4-point scale (0 to 3) with the following response options: *no income, low income/lower class, middle income/middle class, high income/upper class*. Educational attainment was measured on a 4-point scale (1 to 4) with the following response options: *high school or less, some college, college degree (4-year), graduate school*. For each of these variables, higher scores indicated higher SES.

Measures – Outcome

Sexual fluidity in attractions—Sexual fluidity in attractions was assessed with two items. One item measured lifetime sexual fluidity, “Have you ever experienced a change in attractions to others? (For example, feeling only attracted to women, then feeling attracted to both women and men)” (*yes, no*). A second item measured post-transition sexual fluidity among participants who responded *yes* to the first item, “Did you experience a change in attractions to others after recognizing you were transgender and/or gender nonconforming? (For example, feeling only attracted to women before transition, then feeling attracted to both women and men after transition)” (*yes, no*).

Procedure

Respondents completed a one-time web-based quantitative survey that included questions about sexual orientation identity and sexual fluidity in attractions. The majority of respondents completed the survey online ($n = 397$) and 55 respondents completed the survey in-person at community events via electronic tablet. Although no individual incentives were offered for participation, respondents had the option of being entered into a raffle in which the study team gave away two electronic tablets. Details concerning methodology and study procedures have been reported elsewhere (Reisner, White et al., 2014). This study was approved by the Fenway Health Institutional Review Board.

Statistical Analyses

Data were analyzed using SAS[®] version 9.3 statistical software. Univariable descriptive statistics were obtained for all variables of interest. Distributions of individual items were assessed, including missingness. Because missingness was differential and violated the missing completely at random assumption required for valid statistical inferences using listwise deletion (Allison, 2001), data were multiply imputed. To be consistent with previous transgender research (Reisner, Conron et al., 2014), a fully conditional specification (FCS; Van Buuren, 2007; Van Buuren, Brand, Groothuis-Oudshoorn, & Rubin, 2006) imputation method was used (5 burns). All subsequent statistical analyses were conducted using the imputed data.

First, we compared respondents who reported ever experiencing a change in attractions in their lifetime to those who did not report lifetime changes in attractions, using the whole sample ($N=452$). A single multivariable logistic regression model was estimated with change in attractions (*yes, no*) as an outcome as a function of sociodemographic characteristics: gender identity (trans masculine vs. trans feminine), non-binary gender identity, sexual orientation identity, visual gender nonconformity, social gender transition, medical gender affirmation, race/ethnicity, survey mode, age, age first recognized transgender identity, perceived income/class, and educational attainment. Based on previous research findings indicating that gender minority individuals may be more likely to experience sexual fluidity following gender transition, we then restricted the sample to respondents who reported a history of social gender transition ($N=205$) and used a multivariable model to compare those who reported a change in attractions post-transition (defined as social transition, living full-time as identified gender) to those who did not (*yes, no*) as a function of the sociodemographics listed above. Adjusted Risk Ratios (aRR) were

estimated (Spiegelman & Hertzmark, 2005) rather than odds ratios because the prevalence of outcomes were >10%. aRR's and 95% confidence intervals (95% CI) are reported.

Results

Sociodemographics for the full sample are reported in Table 1. The majority of the sample (63.1%) was trans masculine and 40.9% reported a non-binary gender identity (Table 1). The sample endorsed diverse sexual orientation identities: 42.7% queer, 19.0% other non-binary, 15.7% bisexual, 12.2% straight, and 10.4% gay/lesbian. Overall, 58.2% reported having changed attractions in their lifetime. In adjusted models, individuals reporting lifetime changes in attractions were significantly more likely to be trans masculine; to have a non-binary gender identity; to have a sexual orientation identity that is bisexual, queer, or other non-binary; to have had medical gender affirmation; and to have a higher perceived income/class (Table 1). However, individuals reporting lifetime changes in attractions were significantly less likely to be black, other race/ethnicity or multiracial, compared to white non-Hispanic; to complete the survey online, and to have lower educational attainment.

Among those who socially transitioned, 64.6% reported a change in attractions post-transition (Table 2). In an adjusted model, individuals reporting a change in attractions post-transition were significantly more likely to have accessed medical gender affirmation, to be multiracial, to have realized their transgender identity at an older age, and to have higher levels of education. However, individuals reporting a change in attractions post-transition were significantly less likely to be trans masculine, to have a non-binary gender identity, to have moderate or low visual gender nonconformity, and to be Hispanic or other race/ethnicity related to white non-Hispanic.

Discussion

This research examined sexual orientation identities and sexual fluidity in attractions in a community-based sample of transgender and gender nonconforming adults, including examining gender differences and identity related factors. Consistent with previous research indicating that many gender minority individuals utilize sexual orientation identities that reflect attractions toward more than one gender (Meier et al., 2013), the current research found that participants endorsed a wide range of sexual orientation identities. The most frequently endorsed identity was *queer*, with nearly 43% of the sample identifying their sexual orientation as such. This finding is consistent with other research that includes *queer* as a response option when assessing sexual orientation among gender minority individuals (Meier et al., 2013; Reisner et al., 2013; Grant et al., 2011). This particular sexual orientation identity may reflect the complexity of quantitatively assessing sexual orientation among gender minorities. In the majority of research assessing sexual orientation in this population, the item used to measure sexual orientation does not specify the point of reference; for instance, whether the participant should respond based on their sex assigned at birth or their current gender identity. Undoubtedly, this has led to a large amount of error in reporting sexual orientation in gender minority samples. In the current research, it is possible that the large percentage of participants reporting a queer sexual orientation identity is due to participants' uncertainty in how to answer the question.

Alternatively, queer may be the sexual orientation identity of choice, regardless of the question asked. Although queer has historically been a derogatory term used against sexual and gender minorities, it has been reclaimed in recent years within both sexual and gender minority communities to describe sexual orientation and/or gender identity (Horner, 2007; Kuper et al., 2012; Savin-Williams, 2005). For many individuals, the queer sexual orientation identity label allows for greater flexibility than other identity labels, in that the term does not specify the directionality of attractions, nor is it attached to assumptions made about specific sexual orientation groups, such as the assumption of equal attraction toward women and men among bisexual individuals (Barker, Richards & Bowes-Catton, 2009; Drechsler, 2003). The use of queer to describe sexual orientation may also represent an active refusal to endorse more traditional sexual orientation identities that may not adequately describe a person's sexual orientation, or it may indicate alignment with feminism and queer activism (Serano, 2013). Particularly for individuals who experience sexual fluidity, queer is commonly used as a sexual orientation identity because it can encompass both stability and change in sexual orientation. As evidence, participants in the current study who reported sexual fluidity in attractions were more likely to identify as queer than participants who did not report sexual fluidity (47% vs. 37%).

In the total sample, more than half of participants reported sexual fluidity in attractions, and among those who had socially transitioned, nearly two thirds of participants reported sexual fluidity. Compared to Meier et al.'s (2013) research, more trans masculine participants in the current study reported sexual fluidity in attractions both across the sample and among participants who had socially transitioned. Thus, the current research contributes to the growing body of evidence demonstrating that sexual fluidity is common among gender minority individuals. This research extends Meier et al.'s (2013) research to include trans feminine individuals, demonstrating that many individuals within this group also experience sexual fluidity in attractions, although with less frequency than trans masculine individuals.

Gender differences in frequency of sexual fluidity in attractions may be attributed to the use of gender affirming hormones; in particular, the use of testosterone among trans masculine individuals. Testosterone use among trans masculine individuals has been associated with a number of sexual side effects, including increased sex drive (WPATH, 2011). In Meier et al.'s (2013) research, change in sexual orientation among trans masculine participants was associated with testosterone use, although a number of variables likely confounded this association, including passing, comfort with one's body, and time since gender transition. In the current study, participants who reported sexual fluidity in attractions were nearly three times more likely to have undergone some type of medical gender affirmation (hormones and/or surgery), compared to participants who did not report sexual fluidity in attractions. It appears as though sexual fluidity in attractions should be considered an additional potential "side effect" of testosterone use among trans masculine individuals, particularly among those individuals who had attractions only toward women prior to transitioning (Meier et al., 2013).

The gender difference in sexual fluidity may be linked to previous research with cisgender individuals. As mentioned, some studies have found greater sexual fluidity among cisgender females compared to cisgender males (Dickson et al., 2003; Kinnish et al., 2005; Savin-

Williams et al., 2012), although other research has found the opposite pattern (Rosario et al., 2006) or no gender difference (Katz-Wise, 2015; Ott et al., 2011). Some researchers have proposed that females have an inherent erotic plasticity that could result in greater flexibility in sexuality (Baumeister, 2000). If it is true that females are more likely than males to experience sexual fluidity, and that such gender differences have an inherent (i.e., biological) component, then the finding that trans masculine individuals (who were assigned female at birth) are more likely than trans feminine individuals (who were assigned male at birth) to experience sexual fluidity would support this notion. Alternatively, trans masculine individuals may have greater opportunity than trans feminine individuals to explore their sexuality following gender transition because of the suppression of female sexuality (Baumeister & Twenge, 2002) and the greater social freedom associated with male sexuality in U.S. society. Trans feminine individuals may also disproportionately experience femmephobia (Blair & Hoskin, 2014), prejudice and discrimination directed at people who are femininely gendered (Hoskin, 2013), which may serve to inhibit their sexual fluidity in comparison to trans masculine individuals.

Other factors that were significantly associated with sexual fluidity in attractions among the total sample of gender minority individuals in the current research were having a nonbinary gender identity (e.g., genderqueer, gender nonconforming) and having a nonbinary sexual orientation identity (e.g., bisexual, queer). Similarly to the prevalence of queer sexual orientation identity in the sample, individuals who reported a nonbinary gender identity were more likely to report sexual fluidity in attractions compared to individuals who reported a binary gender identity (woman/MTF/trans woman, man/FTM/trans man). Although research on nonbinary gender identities is limited, the few studies that have been conducted indicate that it is common for these individuals to report nonbinary sexual orientation identities (Factor & Rothblum, 2008; Kuper et al., 2012). For these individuals, having a nonbinary gender identity as the point of reference for defining sexual orientation may necessarily result in the use of nonbinary sexual orientation identities because binary sexual orientation identities (e.g., lesbian/gay, heterosexual) anchored to binary gender categories do not fit their nonbinary gender identity.

Perceived income/class was also related to the likelihood of reporting sexual fluidity in attractions in the current research in that individuals with a higher perceived income/class were more likely to experience sexual fluidity. In research on sexual fluidity among cisgender individuals and associations with SES, some research has found that SES is related to likelihood of sexual fluidity (Diamond, 2008a), whereas other research has demonstrated no association between SES and sexual fluidity (Rosario et al., 2006). Specifically, Diamond (2008a) found that participants with a higher SES were more likely to demonstrate sexual fluidity in sexual orientation identity over time, compared to participants with a lower SES. It is possible that perceived income/class level in the current sample also reflects level of education, in that individuals who have higher education levels may be more likely to be sexually fluid because they are more likely to be exposed to the idea of sexual fluidity (e.g., in a college course). In the current research, higher educational attainment was associated with a lower likelihood of sexual fluidity in attractions among the total sample, but a higher likelihood of sexual fluidity among participants who reported a social transition.

Relatedly, a higher SES might afford individuals greater protection and freedom to express their sexuality, which may be related to greater likelihood of sexual fluidity. A study of outness and health among gay and bisexual men found that being out regarding sexual minority status was linked to physical health benefits for higher SES men, but physical health problems for lower SES men (McGarrity & Huebner, 2014). This pattern may also apply to sexual fluidity, in that sexual fluidity may be beneficial to well-being among higher SES individuals but not among lower SES individuals. It is clear that more research is needed to understand the association between SES and sexual fluidity among both cisgender and gender minority individuals and implications for health and well-being. Likewise, associations between race/ethnicity and sexual fluidity in attractions among transgender and gender nonconforming people are understudied. The finding that white non-Hispanic respondents had the highest frequency of reported lifetime changes in sexual attractions relative to racial/ethnic minorities warrants future investigation.

A number of limitations should be mentioned. The sexual orientation measure used in this research has not been rigorously tested or validated with gender minority individuals. Although this research measured sexual fluidity in attractions, we did not assess sexual fluidity in other components of sexual orientation, such as sexual orientation identity. In addition, the directionality of fluidity was not assessed; we did not have information regarding whether individuals' attractions were moving from one gender to another gender (e.g., male-only to female-only) or from one gender to multiple genders (e.g., female-only to bisexual) or vice versa. Sexual fluidity in attractions among gender minority individuals may also reflect attraction toward other gender minority individuals, which was not captured in this study. Finally, due to the cross-sectional nature of the survey, results are associational and causal inferences could not be made. While this study gathered information from transgender and gender nonconforming people from all major regions of Massachusetts and utilized bimodal sampling methods to ensure a diverse community-based sample, the true representativeness of these non-probability convenience sample data cannot be determined. It is possible that the data may not be generalizable to gender minority individuals outside of the state or to samples recruited utilizing different recruitment methods.

This study has important implications for future research. First, validation studies of sexual orientation questions are needed with gender minority individuals. Considering the complexity of responding to questions about sexual orientation when it is not clear whether sex assigned at birth or current gender identity is the reference group, questions could be developed to assess sexual orientation that make this distinction clearer and cognitive interviewing techniques could be used to ensure that participants are responding to questions as intended. Second, given the high prevalence of a queer sexual orientation identity in this and other community-based samples of gender minority individuals, our data suggest the utility of and need to include *queer* as a response option in surveys of gender minority communities. One limitation of past research on sexual fluidity among gender minority individuals, including the current study, is that assessments of sexual fluidity did not allow for reporting more than one change in attractions or sexual orientation identity. Future research on sexual fluidity among transgender and gender nonconforming individuals would benefit from assessing fluidity in multiple components of sexual orientation and assessing

the directionality, frequency, and timing of changes, particularly in relation to other developmental milestones such as social, medical, and legal gender affirmation.

This study also has important implications for clinical practice. Consistent with previous research, the current study found that testosterone use was associated with sexual fluidity in attractions among trans masculine individuals (Meier et al., 2013). Clinicians prescribing cross-sex hormone therapy or working with trans masculine patients should not assume that sexual orientation will remain stable. The existence of sexual fluidity among gender minority individuals may also inform discussions between medical and mental health providers and their transgender or gender nonconforming patients. For example, a trans masculine individual who has historically identified as a lesbian and engaged in sexual behavior with cisgender women may experience increased attractions toward cisgender men and other trans masculine individuals following testosterone treatment. Sexual health topics, such as condom use and contraception, which may not have been previously relevant to this individual's health, are now an important part of the conversation between him and his health care provider.

The aim of this research was to characterize sexual orientation identities and sexual fluidity in attractions in a community-based sample of transgender and gender nonconforming adults, including examining gender differences and related factors. To our knowledge, this is one of the first studies to report the frequency of sexual fluidity in attractions among gender minority individuals with a diverse range of gender identities, including non-binary identities. This study also adds to the small, but growing body of research documenting the use of a queer label to describe sexual orientation among gender minority individuals. This research increases knowledge about this still-understudied population and provides direction for future research on sexual orientation and sexual fluidity among transgender and gender nonconforming individuals.

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Table 1
Lifetime Self-Reported Changes in Attractions in 452 Gender Minority Individuals: Multivariable Logistic Regression Model

Measure	Ever Changed Attractions (58.2%)		Never Changed Attractions (41.8%)		Total Sample (N=452)	Multivariable Model Outcome: Changes Y/N (Adjusted)		p-value
	%	%	%	%		aRR (95% CI)		
Gender Identity								
Trans Feminine	31.2	45.0	36.9	Ref				
Trans Masculine	68.8	55.0	63.1	1.69 (1.34, 2.12)				<0.0001
Non-Binary Gender Identity								
No	38.6	61.4	59.1	Ref				
Yes	42.6	38.6	40.9	1.39 (1.11, 1.76)				0.005
Sexual Orientation Identity								
Straight	9.1	16.4	12.2	Ref				
Gay/Lesbian	6.1	16.4	10.4	0.82 (0.56, 1.21)				0.314
Bisexual	16.7	14.3	15.7	2.21 (1.56, 3.12)				<0.0001
Queer	46.8	37.0	42.7	2.08 (1.51, 2.86)				<0.0001
Other Non-Binary	21.3	15.9	19.0	2.80 (2.00, 3.92)				<0.0001
Visual Gender Nonconformity								
High	17.5	22.8	19.7	Ref				
Moderate	29.7	29.3	29.5	1.30 (0.99, 1.69)				0.051
Low	52.9	47.9	50.8	1.28 (0.99, 1.69)				0.051
Social Gender Transition								
No	23.1	25.3	24.0	Ref				
Yes (live full-time)	76.9	74.7	76.0	0.82 (0.65, 1.03)				0.093
Medical Gender Affirmation								
No	38.4	54.5	45.1	Ref				
Yes (hormones and/or surgery)	61.6	45.5	54.9	2.95 (2.34, 3.72)				<0.0001
Race/Ethnicity								
White Non-Hispanic	83.3	74.1	79.4	Ref				
Black Non-Hispanic	1.9	4.2	2.9	0.46 (0.26, 0.82)				0.009
Hispanic/Latino	8.4	11.1	9.5	0.89 (0.64, 1.23)				0.473

Measure	Ever Changed Attractions (58.2%)		Never Changed Attractions (41.8%)		Total Sample (N=452)		Multivariable Model Outcome: Changes Y/N (Adjusted)	
	%		%		%		<i>aRR</i> (95% <i>CI</i>)	<i>p-value</i>
Other Race/Ethnicity Non- Hispanic	1.9		4.2		2.9		0.350 (0.29, 0.87)	0.014
Multiracial Non-Hispanic	4.6		6.4		5.3		0.46 (0.31, 0.69)	0.0002
Survey Mode								
In-Person	83.1		16.9		12.2		Ref	
Online	91.3		8.7		87.8		0.64 (0.47, 0.89)	0.007
	<i>M</i> (<i>SD</i>)		<i>M</i> (<i>SD</i>)		<i>M</i> (<i>SD</i>)		<i>aRR</i> (95% <i>CI</i>)	<i>p-value</i>
Development								
Age (years; range: 18–75)	31.6 (12.3)		33.9 (13.3)		32.6 (12.8)		1.00 (0.99, 1.01)	0.436
Age Realized Transgender (years; range: 0–54)	14.3 (7.9)		13.6 (9.8)		14.0 (8.7)		1.01 (0.99, 1.02)	0.117
Socioeconomics								
Perceived income/class (range: 0–3)	1.4 (0.7)		1.4 (0.7)		1.4 (0.7)		1.15 (1.01, 1.31)	0.038
Educational attainment (range: 1–4)	2.7 (0.9)		2.6 (1.1)		2.6 (1.0)		0.81 (0.73, 0.90)	0.0001

Note. Significant effects are bolded.

Table 2

Self-Reported Changes in Attractions After Social Gender Transition in 205 Gender Minority Individuals; Multivariable Logistic Regression Model

Measure	Changed Attractions Post-Transition (64.6%)	Did Not Change Attractions Post-Transition (35.4%)	Total Sample (N=205)	Outcome: Change Post-Transition Y/N (Adjusted) <i>aRR</i> (95% <i>CI</i>)	<i>p</i> -value
Gender Identity					
Trans Feminine	26.9	19.0	24.1	Ref	
Trans Masculine	73.1	81.0	75.9	0.44 (0.28, 0.69)	0.0003
Non-Binary Gender Identity					
No	73.9	45.4	63.8	Ref	
Yes	26.1	54.6	36.2	0.30 (0.20, 0.45)	<0.0001
Sexual Orientation Identity					
Straight	10.6	8.3	9.8	Ref	
Gay/Lesbian	6.6	6.3	6.5	1.05 (0.49, 2.24)	0.896
Bisexual	13.8	14.9	14.1	0.93 (0.51, 1.70)	0.815
Queer	48.3	48.8	48.5	1.10 (0.62, 1.94)	0.742
Other Non-Binary	20.7	21.8	21.1	0.91 (0.51, 1.64)	0.752
Visual Gender Nonconformity					
High	14.2	29.8	16.2	Ref	
Moderate	30.7	35.0	30.4	0.54 (0.34, 0.86)	0.009
Low	55.1	50.1	53.4	0.47 (0.30, 0.74)	0.001
Medical Gender Affirmation					
No	18.1	47.9	28.7	Ref	
Yes (hormones and/or surgery)	81.9	52.1	71.3	2.78 (1.87, 4.14)	<0.0001
Race/Ethnicity					
White Non-Hispanic	83.7	79.9	82.3	Ref	
Black Non-Hispanic	3.0	1.4	2.4	1.89 (0.65, 5.52)	0.244
Hispanic/Latino	6.0	14.6	9.2	0.31 (0.18, 0.51)	<0.0001
Other Race/Ethnicity Non- Hispanic	1.5	2.8	1.9	0.21 (0.07, 0.57)	0.002
Multiracial Non-Hispanic	5.7	1.4	4.2	7.58 (2.78, 20.83)	<0.0001
Survey Mode					

Measure	Changed Attractions Post-Transition (64.6%)		Did Not Change Attractions Post-Transition (35.4%)		Total Sample (N=205)	Outcome: Change Post-Transition Y/N (Adjusted)	
	%	M (SD)	%	M (SD)		aRR (95% CI)	p-value
In-Person	10.0		8.3		9.4	Ref	
Online	90.3		91.7		90.6	1.53 (0.86, 2.70)	0.149
Development							
Age (years; range: 18–75)	32.7 (12.5)		29.9 (11.5)		31.7 (12.2)	0.99 (0.98, 1.01)	0.365
Age Realized Transgender (years; range: 0–40)	13.8 (7.6)		13.4 (6.7)		13.7 (7.3)	1.06 (1.04, 1.09)	<0.0001
Socioeconomics							
Perceived income/class (range: 0–3)	1.4 (0.7)		1.4 (0.8)		1.4 (0.7)	0.84 (0.67, 1.05)	0.120
Educational attainment (range: 1–4)	2.8 (0.9)		2.5 (0.9)		2.7 (0.9)	1.72 (1.42, 2.08)	<0.0001

Note. Significant effects are bolded.