

Sexual Fluidity in Male and Females

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Abstract Sexual fluidity has been defined as a capacity for situation-dependent flexibility in sexual responsiveness, which allows individuals to experience changes in same-sex or other-sex desire across both short-term and long-term time periods. I review recent evidence for sexual fluidity and consider the extent of gender differences in sexual fluidity by examining the prevalence of three phenomena: nonexclusive (bisexual) patterns of attraction, longitudinal change in sexual attractions, and inconsistencies among sexual attraction, behavior, and identity. All three of these phenomena appear to be widespread across a large body of independent, representative studies conducted in numerous countries, supporting an emerging understanding of sexuality as fluid rather than rigid and categorical. These studies also provide evidence for gender differences in sexual fluidity, but the extent and cause of these gender differences remain unclear and are an important topic for future research.

Keywords Sexual orientation · Gender differences · Bisexuality · Sexual fluidity · Same-sex attraction

Historically, the dominant model of sexual orientation has been a categorical one, positing the existence of two fundamentally different types of people (*homosexuals* and *heterosexuals*) characterized by two fundamentally different types of sexual attraction (same-sex versus other-sex). Although this model has been revised to accommodate a third type of individual (*bisexuals*,

possessing both same-sex and other-sex attractions), its core assumptions regarding the fixed and categorical nature of sexual orientation have continued to hold sway. As summarized in a recent Institute of Medicine report (which represents current scientific thinking on the topic), sexual orientation is “an enduring pattern of or disposition to experience sexual or romantic desires for, and relationships with, people of one’s same sex, the other sex, or both sexes” [1, p. 27].

This model of sexual orientation ably characterizes the experiences of many men and women, but not all of them. Over the past several decades, researchers have documented numerous cases in which individuals report unexpected changes—sometimes transient and sometimes lasting—in their sexual attractions, identities, and/or behaviors. The capacity for such change is denoted *sexual fluidity* [reviewed in 2••, 3•], and researchers are actively investigating and debating its prevalence, causes, and implications. One of the most significant unanswered questions regarding sexual fluidity concerns gender differences. Although early studies of sexual fluidity suggested that it was more common in women than in men [4•, 5], recent studies have begun to challenge this view. The goal of the present analysis is to review and synthesize the current empirical evidence on this question. Only by comprehensively comparing different manifestations of sexual fluidity in men and women can we move toward more accurate scientific understandings of female and male sexual orientation more generally.

Sexual fluidity is defined as a capacity for situation-dependent flexibility in sexual responsiveness, which allows individuals to experience changes in same-sex or other-sex desire, over both short-term and long-term time periods. The existence of sexual fluidity does not imply that “everyone is bisexual,” or that sexual orientation does not exist. Rather, it indicates that sexual orientation does not rigidly predict each and every desire an individual will experience over the lifespan: Some gay men and lesbians experience periodic

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other-sex attractions, just as some heterosexuals experience periodic same-sex attraction. The word *some* is used because sexual fluidity appears to vary from person to person. Hence, certain individuals show very stable patterns of same-sex or other-sex sexual attraction over the lifespan, whereas others show variations in sexual attractions.

There is no direct way to measure an individual's capacity for sexual fluidity or its prevalence within a specific population. Yet we can indirectly assess sexual fluidity by looking for the following three phenomena, which are its most common manifestations: (1) nonexclusive (i.e., bisexual) sexual attractions, (2) change in sexual attractions over time, and (3) inconsistencies among sexual attraction, behavior, and identity. Below, we review recent research on each of these phenomena in men and women.

Nonexclusive Sexual Attractions

One of the most common questions about sexual fluidity is "How does it differ from bisexuality?" After all, both sexual fluidity and bisexuality produce the same phenomenological result: sexual attractions for *both* men and women (although not always concurrently). The primary difference between sexual fluidity and bisexuality is that the latter is conceptualized as a *stable sexual predisposition* giving rise to consistent experiences of nonexclusive desires (i.e., desires for both men and women) over the life course. In contrast, sexual fluidity is conceptualized as a capacity for change in erotic responsiveness. For some individuals, this capacity may never be expressed. Others may only encounter one or two circumstances over their lifespan which give rise to changes in sexual feelings. Hence, although both bisexuality and sexual fluidity can produce non-exclusive sexual attractions, such attractions are expected to be a regular feature in the lives of bisexually oriented individuals, whereas they may prove more sporadic and/or context-specific for individuals who are highly sexually fluid.

Of course, the exact boundary between "regular" and "sporadic" patterns of sexual attraction is unknown, and hence, this distinction is more useful conceptually than empirically. The main point is to emphasize that sexual fluidity represents a context-dependent capacity for *change* in attractions, whereas bisexuality represents a pattern of *mixed* attractions. They both give rise to the same observable phenomenon—nonexclusive sexual attractions—but through different pathways. Accordingly, when individuals report experiences of nonexclusive attractions, we have no way to know whether such experiences stem from bisexuality or sexual fluidity. This makes it difficult to interpret data on gender differences in nonexclusive attractions: Gender differences in nonexclusive attractions might result from gender differences in the prevalence of bisexuality, gender differences in sexual fluidity, or both. Despite the impossibility of differentiating among these

possibilities, it is still useful and informative to examine the current evidence regarding the population prevalence of non-exclusive versus exclusive same-sex attractions and whether these prevalence estimates differ for men versus women.

Figure 1 summarizes the most reliable international data on this question from 16 studies published between 2010 and 2016, each of which used a representative probability sample of adults, with sample sizes ranging from several thousand to several million participants (specific sample sizes are listed below). Each column shows the percentage of same-sex attracted individuals in the survey who reported exclusive attractions versus non-exclusive attractions. Separate graphs are presented for men versus women to illustrate the consistently higher rates of nonexclusive attractions among women than among men. Data are presented from left to right according to year of publication, and the characteristics of each study are as follows: (a) the Integrated Household Survey, $N = 340,000$, UK [6]; (b) the Massachusetts Behavioral Risk Factor Surveillance Surveys, 2001–2008, $N = 67,359$, USA [7]; (c) Norway's Survey of Living Conditions, $N = 6238$, Norway [8]; (d) the 2006–2008 National Survey of Family Growth, $N = 13,496$, USA [9]; (e) the National Survey of Sexual Health and Behavior, $N = 5865$, USA [10]; (f) the New Zealand Mental Health Survey, $N = 12,992$, New Zealand [11]; (g) Wave 2 of the National Epidemiologic Survey of Alcohol and Related Conditions, $N = 34,653$, USA [12]; (h) Sexual Health in the Netherlands, $N = 4289$, Netherlands [13]; (i) Wave 4 of the National Longitudinal Study of Adolescent Health, $N = 14,421$, USA [14]; (j) the 2008 General Social Survey, $N = 3559$, USA [15]; (k) the National Survey of Sexual Attitudes and Lifestyles, $N = 15,162$, UK [16]; (l) the Context of Sexuality in France, $N = 9872$, France [17]; (m) the Australian Study of Health and Relationships, $N = 20,094$, Australia [18]; (n) the National Health Interview Survey, $N = 120,186$, USA [19]; (o) the English General Practice Patient Survey, $N = 2,169,718$, UK [20]; (p) the Behavioral Risk Factor Surveillance System across 7 different states, 2005–2010, $N = 405,145$ [21]; (q) the 2011–2013 National Survey of Family Growth, $N = 9175$, USA [22•].

These data show that nonexclusive patterns of same-sex attraction are more common among women than among men. The reasons for this gender difference are not clear. One possibility is that there is a basic and fundamental sex difference rendering women more likely than men to experience bisexual arousal. This is consistent with experimental research showing that women (both lesbian and heterosexual) show similar levels of genital arousal to sexual stimuli depicting their "non-preferred" and their "preferred" sex, whereas men show substantially less genital arousal to their "non-preferred" sex than to their "preferred" sex [23, 24••, 25]. In interpreting these data, it is important to point out that genital assessments of arousal are less amenable to conscious control (which is why they are often used in clinical assessments of sex offenders) than self-report data. Hence, these

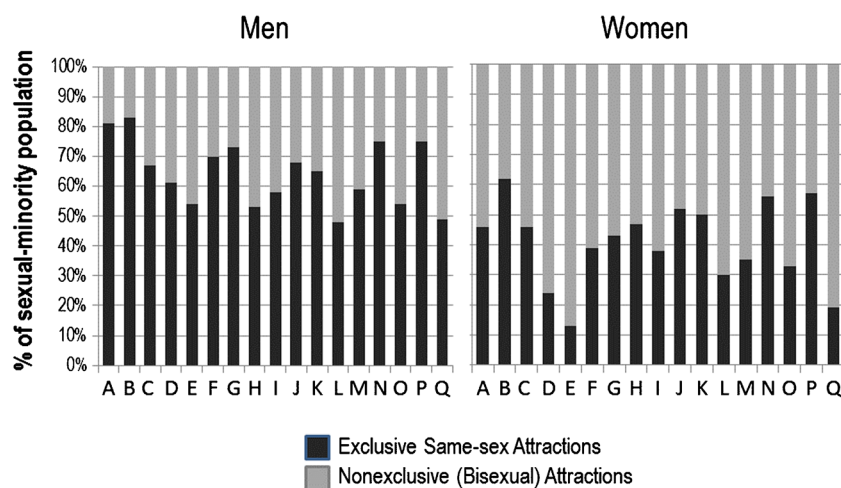


Fig. 1 Percentages of same-sex attracted men and women showing exclusive versus nonexclusive patterns of attraction, across 16 representative studies. **a** The Integrated Household Survey, $N = 340,000$, UK [6]. **b** The Massachusetts Behavioral Risk Factor Surveillance Surveys, 2001–2008, $N = 67,359$, USA [7]. **c** Norway’s Survey of Living Conditions, $N = 6238$, Norway [8]. **d** the 2006–2008 National Survey of Family Growth, $N = 13,496$, USA [9]. **e** the National Survey of Sexual Health and Behavior, $N = 5865$, USA [10]. **f** the New Zealand Mental Health Survey, $N = 12,992$, New Zealand [11]. **g** Wave 2 of the National Epidemiologic Survey of Alcohol and Related Conditions, $N = 34,653$, USA [12]. **h** Sexual Health in the Netherlands,

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findings do not suggest that heterosexual men are more likely to consciously suppress same-sex arousal than are heterosexual women or that gay men are more likely to consciously suppress other-sex arousal than are lesbians. Rather, they appear to represent basic sex differences in arousal patterns. There are a number of different potential evolutionary reasons that such a sex difference in the capacity for bisexuality might have evolved [25–27, 28•], but at the current time, there is no consensus view.

It is also possible that social factors explain gender difference in rates of nonexclusive attractions. Historically, female sexuality has been subjected to far greater social control than male sexuality [29–32], and scholars have argued that this has specifically limited women’s opportunities to *desist* from conventional heterosexual relationships in favor of same-sex relationships, given the social and economic costs that women have historically incurred by rejecting their traditional roles as wives and mothers [33–35]. Accordingly, women desiring same-sex behavior may find it easier and safer to pursue such behavior *alongside* heterosexual behavior, rather than rejecting heterosexuality altogether.

The ability of social factors (specifically, increased social acceptance and visibility of same-sex sexuality) to influence the expression of sexual attraction and behavior has been demonstrated by a number of studies which have shown population-wide increases in rates of same-sex attraction and behavior over the past several decades, a period during which acceptance of same-sex sexuality has notably increased [36, 37•]. For

example, Mercer and colleagues [16] compared rates of same-sex behavior across three consecutive administrations, each 10 years apart, of the National Sexual Attitudes and Lifestyle study, a British probability study that includes over 15,000 men and women at each administration. They found that rates of same-sex behavior were relatively stable among men (6 % in 1990, 8.4 % in 1999, and 7.3 % in 2010) but increased linearly among women (from 3.7 % in 1990 to 9.7 % in 1999 and 16 % in 2010).

Similarly, Gartrell and colleagues [38] compared rates of same-sex contact as reported by 17 year olds in the 2002 and 2011 administrations of the National Survey of Family Growth and found that although the percentage of 17-year-old boys reporting same-sex contact was lower in 2011 (1.4 %) than in 2002 (6.6 %), the percentage of girls reporting same-sex contact was twice as high in 2011 (10 %) as in 2002 (5 %). Kuyper and colleagues (2009) reported significant increases in the population prevalence of same-sex attractions in the Netherlands from 1989 to 2005. Again, increases were larger among women than men. The number of Danish men reporting same-sex attractions doubled over this 15-year period, from 6 to 13 %, whereas the number of Danish women reporting same-sex attractions increased sixfold, from 3 to 18 % [39]. Changes in same-sex behavior also differed by gender, with women showing a threefold increase in rates of same-sex behavior, whereas men’s participation in same-sex behavior did not significantly change.

Twenge and colleagues [37•] examined reports of same-sex behavior across multiple consecutive administrations of the US General Social Survey from 1973 to 2014. They found that the percentage of US adults reporting that they engaged in post-adolescent same-sex sexual contact doubled between 1990 and 2010 (from 4.5 to 8.2 % among men and from 3.6 to 8.7 % among women). They further observed that these increases were specifically driven by increases in *bisexual* patterns of behavior, whereas rates of exclusive same-sex behavior did not show notable change. Because the General Social Survey also asks participants about their attitudes regarding same-sex sexuality, Twenge and colleagues [37•] were able to test whether population-wide increases in same-sex behavior in the USA since 1973 are attributable to concurrent increases in the social acceptance of individuals with same-sex attractions and behaviors; they found that increased social acceptance partially—but not completely—accounts for the historical increases.

Clearly, historical changes in rates of same-sex sexuality are consistently greater among women than in men, which is consistent with other research suggesting that women's sexual behavior is more strongly shaped by social factors (such as her level of education, economic opportunity, social attitudes) than is the case for men [28•, 32, 40, 41]. It is also notable that Twenge and colleagues (2016) found that increases in same-sex behavior—across both genders—were predominantly increases in *bisexual* behavior. This finding dovetails with the finding of gender differences: If women are more likely than men (at a population level) to have bisexual patterns of attraction, and if historical changes in social attitudes about same-sex sexuality have their largest effects on expressions of bisexuality, then we would expect to find larger historical increases in same-sex behavior among women than men, reflecting a greater willingness of women to act upon predispositions for bisexuality that went unexpressed in previous (and more restrictive) decades. Yet an additional contributing factor may be that there is more cultural homophobia directed toward male same-sex sexuality than female same-sex sexuality, making it more socially dangerous for men than for women to explore same-sex desires [reviewed in 2•]. If social acceptance of same-sex sexuality continues to increase, men may eventually “catch up” to women with regard to cohort-level increases in same-sex behavior.

Change in Sexual Attractions over Time

Another potential index of sexual fluidity is longitudinal change in sexual attractions. A number of longitudinal studies have assessed such changes [reviewed in 42•] and such studies generally find that bisexual patterns of attraction show less stability over time than exclusively same-sex patterns of attraction [5, 43, 44], consistent with the notion that bisexually

attracted individuals, by virtue of their capacity to experience attractions to either sex, are more sensitive to environmental and social factors which might alter the relative balance of those attractions over time [2•]. The extent of gender differences in the capacity for change has varied from study to study, as shown in Fig. 2. This figure shows the percentages of women and men reporting changes in their pattern of sexual attraction (including *any* shifts between exclusive and non-exclusive patterns of sexual attraction) across 7 different follow-up assessments: The first two columns display rates of change for waves 2–3 and waves 3–4 of the National Longitudinal Study of Adolescent Health [NLSAH, 45, 46•], representing changes occurring between the ages of 18 and 34; the next three columns display rates of change for waves 1–2, 2–3, and 3–4 of the Dunedin Multidisciplinary Health and Development Study (DMHD), a longitudinal cohort study conducted in New Zealand which tracked changes in sexual attractions from ages 21 to 38 [47, 48]; the fifth column represents changes in the Growing Up Today Study (GUTS), which assessed sexual attractions in the 13,000 children (aged 12–25) of the 116,000 registered nurses who participated in the Nurses' Health Study II [44]; the last column represents data from the National Survey of Midlife Development (NSMD), representing change over a 10-year period among over 5000 men and women in their 40s and 50s [43].

As shown in the figure, some studies show distinctly greater rates of change in women than men, whereas others do not, suggesting that the degree to which women's attractions show more change than men's attractions may be moderated by a number of study factors (age and cohort of assessment, wording of study questions, sample characteristics). Recently, Hu and colleagues [49] examined patterns of change in the National Longitudinal Study of Adolescent Health, focusing

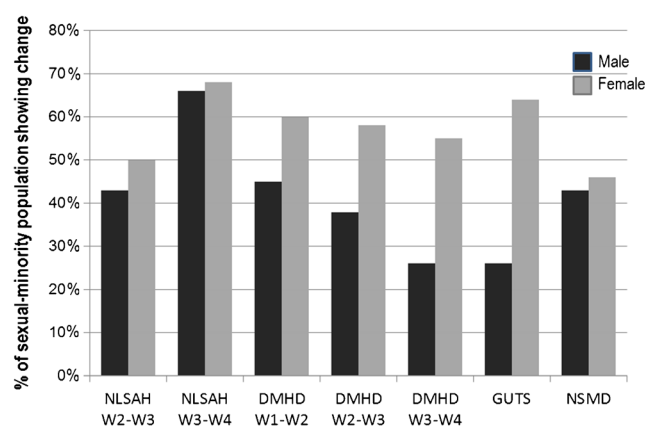


Fig. 2 Percentages of sexual-minority men and women reporting longitudinal changes in sexual attractions in waves 2–3 and waves 3–4 of the National Longitudinal Study of Adolescent Health [NLSAH, 45, 46•], waves 1–2, 2–3, and 3–4 of the Dunedin Multidisciplinary Health and Development Study [DMHD, 47, 48]; the Growing Up Today Study [GUTS, 44], and the National Survey of Midlife Development [NSMD, 43]

specifically on participants' reports of experiencing *any* same-sex or other-sex attraction across different waves, whereas the analyses of Savin-Williams and colleagues [45, 46•] focused on participants' self-reported *orientations* (exclusively heterosexual, mostly heterosexual, bisexual, mostly homosexual, or exclusively homosexual). They did not find greater overall rates of change among women than men, but different *patterns* of change. Exclusively same-sex patterns of attraction proved less stable among women than among men, and in women, there was no difference between the stability of bisexual versus exclusively same-sex patterns of attraction. In men, bisexual patterns of attraction proved less stable than either exclusively same-sex or exclusively other sex patterns. This pattern of results is consistent with the possibility that greater sexual fluidity in women (operationalized here as change over time in sexual attraction) is driven by women's greater propensity for bisexual attractions (even among those women who, in this study, initially described themselves as exclusively same-sex attracted).

The other major conclusion that we can draw from these studies is that change in patterns of same-sex and other-sex attraction is a relatively common experience among sexual minorities. Across the subgroups represented in Fig. 2, between 25 and 75 % of individuals reported substantial changes in their attractions over time, and these findings concord with the results of retrospective studies showing that gay, lesbian, and bisexual-identified individuals commonly recall having undergone previous shifts in their attractions [4•, 5]. Such findings pose a powerful corrective to previous oversimplifications of sexual orientation as a fundamentally stable and rigidly categorical phenomenon [reviewed in 42•]. Yet the emerging body of longitudinal research does not suggest that women are uniformly more changeable than men, contrary to the notion of a global gender difference in sexual fluidity [2•, 28•]. Rather, the role of gender in predicting change varies for individuals who begin with different patterns of attraction, and we have yet to understand how gender might interact with other potential predictors of change, such as age, relationship history, education, and social context.

Before leaving the topic of change, it is critically important to differentiate between the forms of change represented in Fig. 2, which can be described as “unintentional” change, and changes which result from individuals' effortful attempts to eliminate their same-sex attractions in order to conform to social and religious norms which stigmatize and denigrate same-sex sexuality (known as “sexual orientation change efforts”). There is currently no evidence that therapeutic attempts to extinguish same-sex attractions are effective, and in fact these attempts have been found to cause psychological harm [reviewed in 50]. Whereas observational studies of “naturally occurring” change can reveal important information about the expression of sexuality of the life course, studies on effortful therapeutic change are primarily relevant for understanding the psychological consequences of the social privileging of heterosexuality over same-sex sexuality.

Discrepancies among Sexual Attraction, Behavior, and Identity

It is commonly assumed that individuals with exclusive same-sex attractions pursue exclusive same-sex behavior and adopt lesbian or gay identities, whereas individuals with bisexual attractions pursue bisexual behavior and adopt bisexual identities. Yet in reality, discrepancies among attraction, behavior, and identity are widespread [4•, 11, 17, 22•, 40, 51–54]. The two most likely explanations for these discrepancies are (1) the social stigmatization of same-sex sexuality, which prevents many individuals with same-sex attractions from acting on these attractions or from identifying as lesbian/gay/bisexual, and (2) the high prevalence of nonexclusive patterns of attraction, which allows individuals a broad range of behavior and identity options, depending on their current circumstances. As a result of these factors, prevalence estimates for same-sex attraction, same-sex behavior, and lesbian/gay/bisexual identity often diverge: For example, the 2011–2013 National Survey of Family Growth [22•] found that 19 % of women between 18 and 44 reported experiencing same-sex sexual attractions, a smaller percentage (17 %) reported having engaged in same-sex sexual contact, and an even smaller percentage (7.7 %) claimed a lesbian or bisexual identity. Among the men, 7.9 % reported same-sex attractions, 6.2 % reported same-sex sexual contact, and 4.9 % reported a gay or bisexual identity [55].

Perhaps the most noticeable form of discrepancy occurs when individuals who describe their orientations as “heterosexual” report engaging in same-sex behavior. If women are more likely to have bisexual patterns of attraction than men, and if women show a greater sensitivity to social factors which might facilitate the expression of same-sex sexuality, then one might specifically expect to find greater rates of same-sex behavior among heterosexually identified women than men. Figure 3 displays the findings of 6 different representative studies which provide data to address this question: the US National Survey of Family Growth [NSFG, 55], the US National Epidemiologic Study of Alcohol and Related Conditions [NESARC, 12]; the Context of Sexuality in France Study [CSF, 17], the Swedish Youth, Sex, and the Internet Study [YSI, 51], the Massachusetts Youth Risk Behavior Survey [MYRBS, 56], and the aggregated Youth Risk Behavior Survey [YRBS, 57]. The latter three studies involve adolescent respondents, whereas the first three focus on adults. Across these studies, heterosexually identified women are clearly more likely to report same-sex behavior than heterosexually identified men, and this is consistent with the findings of other studies finding less consistency between patterns of sexual behavior and patterns of sexual attraction among women than among men [52, 58].

As with the other research findings reviewed above, it is impossible to definitively discern the reasons for these gender

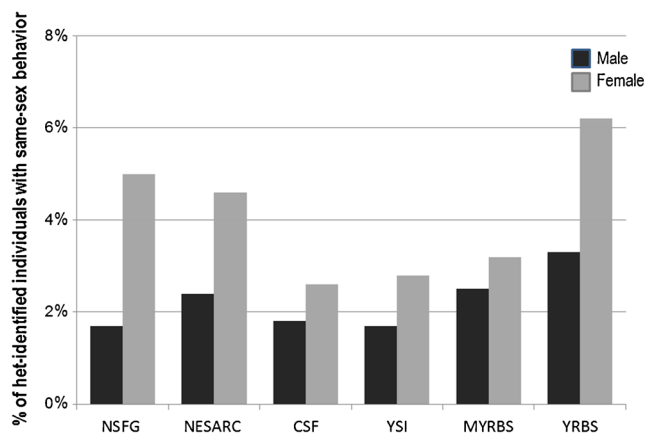


Fig. 3 Percentages of heterosexually identified men and women reporting same-sex behavior in the US National Survey of Family Growth [NSFG, 55], the US National Epidemiologic Study of Alcohol and Related Conditions [NESARC, 12]; the Context of Sexuality in France Study [CSF, 17], the Swedish Youth, Sex, and the Internet Study [YSI, 51], the Massachusetts Youth Risk Behavior Survey [MYRBS, 56], and the aggregated Youth Risk Behavior Survey [YRBS, 57]

differences. They might be interpreted as inevitable consequences of the greater rates of bisexual attraction among women than among men; alternatively, they might reflect that women with same-sex attractions and behavior face greater pressure than men with same-sex attractions and behavior to maintain a heterosexual self-concept; another possibility is that heterosexually identified men with same-sex attractions might be less likely to *act* on those attractions, given the greater homophobia typically directed at men than women; finally, these gender differences might reflect gender differences in the propensity for change over time in attractions, rendering women more likely than men to have patterns of prior behavior that conflict with their current identity. It remains for future research to investigate each of these possibilities, but for now perhaps the most important conclusion is that same-sex behavior among individuals who perceive their attractions as exclusively heterosexual is relatively common among both adolescents and adults, especially among women.

Conclusion

The existing body of international research assessing sexual attractions, behaviors, and identities among representative samples of adolescents and adults shows that sexual orientation is not a static and categorical trait. Rather, same-sex sexuality shows substantial fluidity in both men and women, and this fluidity takes a number of forms. It can be observed in the high rates of nonexclusive (i.e., bisexual) patterns of attraction among men and women; it can be observed in the fact that historical changes in social acceptance of same-sex sexuality have led to increases in the population prevalence of same-sex

sexuality; it can be observed in the high numbers of sexual-minority men and women who show changes in their pattern of attractions over time, well into adulthood; it can be observed in the high numbers of men and women who flexibly engage in patterns of sexual behavior that do not concord with their self-described identity or attractions. Although the extant research suggests that all of these phenomena are somewhat more common in women than in men, it is difficult to draw reliable conclusions about the extent of gender differences in sexual fluidity, and the cause of such gender differences. Given that the most reliable gender difference appears to be the higher prevalence of nonexclusive attractions among women than men, one possibility is that this gender difference drives many of the other gender differences in indices of sexual fluidity (such as the likelihood of change in attractions over time, which appears to be greater among *both* men and women with nonexclusive versus exclusive attractions). Future longitudinal research that carefully examines indices of sexual fluidity among diverse and representative samples of women and men will help to elucidate the dynamic expression of same-sex and other-sex sexuality over the life course.

Compliance with Ethical Standards

Conflict of Interest Lisa M. Diamond declares that she has no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

Ethics Statement All reported studies/experiments with human or animal subjects performed by the authors have been previously published and were in compliance with all applicable ethical standards (including the Helsinki Declaration and its amendments, institutional/national research committee standards, and international/national/institutional guidelines).

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