

Pointing To a Crisis? What Finger-Length Ratios Tell Us About the Construction of Sexuality.

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Introduction

In the Spring of 2000, the journal *Nature* published a page long 'brief communication' by Williams, Pepitone, Christensen, Cooke, Huberman, Breedlove, Breedlove, Jordan, and Breedlove. These researchers had interviewed 720 participants at street fairs in the San Francisco Bay Area in California and questioned them about their sexual orientation and family history. They also photocopied each participant's hands. Later, in the lab, they replicated past findings that the ratio of the length of the second finger to the fourth finger (2D:4D) on the right hand is larger among heterosexual women than among heterosexual men. (Their mean ratios were about 0.973:1 and 0.955:1 respectively). The gender difference among lesbian- and gay-identified participants was considerably smaller. (Their mean ratios were about 0.963:1 and 0.955:1 respectively). Overall, the sex difference was highly significant, $p < .001$. Bisexual-identified people that the researchers encountered were not mentioned in this report.

For many people such tiny differences might seem uninteresting, but this research quickly generated several times its own word-length in news articles. Using Lexis-Nexus, I located sixteen news reports in English about this study published in American, Canadian, Australian, and British newspapers. The speed and span of the journalistic response to this biological study of sexual orientation is not atypical (Conrad & Merkins, 2001; Nelkin & Lindee, 1995). Interest was not confined to science buffs: most articles were not in the science sections of newspapers. This suggests that we inhabit a world where ordinary people commonly look to scientific expertise for the 'truth' about their own sexuality and the sexuality of others (Foucault, 1976/78).

Below I critically analyze the discourse of Williams' *et al.*'s (2000) article and the news reports that followed it. My goal is not to argue that Williams *et al.*'s work is constructed and therefore dismissable, or irrelevant (see Stein, 1999 on essentialism and constructionism).

Rather, I assume that all scientific work is necessarily social and representational (Latour, 1987), and that the work of examining science as culture proceeds, in part, by particularizing the shared, but particular, representations that consistently frame interpretations of bodily similarities and differences (see e.g., Fausto-Sterling, 1992; Hegarty, 1997; Ordover, 1995; Terry, 1997).

In the early 1990s, biological research on the neuroanatomy (LeVay, 1991) and genetics (Hamer, Hu, Magnusson, Hu, & Pattatucci, 1993) of male sexual orientation was often in the news. Such research was often perceived as pro-gay because it presented homosexuality as something that could not be freely chosen. However, as literary critic Eve Sedgwick (1990) pointed out, biological accounts problematically continued to describe the bodies of gay and lesbian subjects as 'excessive', 'deficient', or 'imbalanced,' and to position heterosexual bodies as the norm (see also Byne and Parsons, 1993, p. 236).

Thus, these biological arguments displaced heterosexist shame and stigma more than they undid it. Ordover (1996) suggested that Hamer's gay gene theory shifted the blame onto the mothers of gay men (much like earlier psychoanalytic theories) by locating mothers' bodies as the source of their sons' sexualities. Indeed, biological arguments about sexual orientation prompted popular discussions of the ethics and legality of mothers - typically presumed to be heterosexual - selectively aborting their gay fetuses (e.g., Gideonse, 1997). One ostensibly pro-gay scientist even enthused about a new eugenics for the 'genetically underprivileged' (LeVay, 1996, p. 271). Thus, biological research did not position homosexuality beyond blame and shame, but rather displaced blame and shame onto expectant mothers, and without making explicitly pro-gay arguments.

Descriptions of heterosexual bodies as normative often invoke notions of gender normativity. Philosopher Judith Butler (1990, 1993) argued that the category of physical 'sex' itself presumes heterosexuality; any instincts, hormones, or chromosomes invoked to explain a desire for a male object are gendered 'female,' while anything invoked to explain a desire for a female object is gendered 'male.' Contemporary biological research often proceeds within a similar logic (Hegarty, 1997). Additionally, the bodies studied by researchers were typically male (e.g., Hamer et al., 1993; LeVay, 1991). The popularity of this research may have been partially a result of its promise to address the modern 'chronic, now endemic crisis of homo/heterosexual definition, indicatively male, dating from the end of the nineteenth century' (Sedgwick, 1990, p. 1). However, Williams *et al.* (2000) found stronger evidence for a biological correlate of sexual orientation among women

than among men, and theorized gay men's bodies as 'masculinized' rather than gender inverted. Thus this study can be approached as a 'strong test' of the validity of earlier critiques of biological research which focused concern on heterosexism and androcentrism.

Second, this article attends more closely to statistical representations than have past discussions of biological research. Queer theory more generally has heightened scrutiny to verbal and pictorial representations more than numerical representations of sexuality. This problematic strategy risks creating the impression that numerical representations are somehow 'less constructed' than other forms of representation. Yet as Gould (1981) has shown in regard to scientific racism, culture works through choices of variables to study, operationalizations of particular variables, decisions about which statistical tests to perform, and interpretations of their results. As I show below, statistics are also often invoked to prevent laypersons from contesting scientists' claims about the 'truth' of sexuality.

Women's Bodies and the Physical Category of 'Sex.'

As Butler (1990) might predict, Williams *et al.* (2000) described the results of their study in ways that privileged heterosexual women's bodies over lesbians' bodies. For example;

The right -hand 2D:4D ratio of homosexual women was significantly more masculine (that is, smaller) than that of heterosexual women, and did not differ significantly from that of heterosexual men (Williams *et al.*, 2000).

Note that it is lesbians – and not heterosexual women – who are described as significantly different. Felicia Pratto and I have shown in social psychology experiments that repeated framings of gay and lesbian subjects as different from heterosexuals follow from cognitive assumptions of heteronormativity (Hegarty & Pratto, 2001). Once positioned as other, lesbian's bodies were quickly described as masculinized;

Thus finger ratios . . . suggest that at least some homosexual women were exposed to greater levels of fetal androgen than heterosexual women (Williams *et al.*, 2000).

Readers of *Nature* might recognize the masculinization inherent in the term 'androgen,' but this was made plainer still in the popular press;

In women the ring and index finger tend to be almost the same length. In men, the index finger is often shorter. . . . The results showed that lesbian women were more “masculine” in the ratio of finger lengths than heterosexual women. (Hawkes, 2000).

The physical difference among the women in the sample could have been understood differently. If lesbians had been considered proper members of the category ‘women’ these results would question the claim that there are universal sex differences in finger-length ratios. Instead, lesbians are doubly ‘otherized;’ first they are positioned as the ones who are ‘different,’ and next they are described as masculine, assigning them a location at the periphery of the category ‘woman.’ Thus, similar to LeVay’s account of the feminized gay brain (c.f., Hegarty, 1997), accounts of Williams *et al.*’s (2000) data conflate the category of ‘sex’ with the particulars of heterosexuals’ bodies.

The description of lesbians’ bodies as ‘masculinized’ is problematic, not because the term is inherently wrong or derogatory, nor because femininity is a valid normative standard, but because the conflation of masculinity with *heterosexual* masculinity, renders lesbian bodies intelligible only within a scheme that takes heterosexuality as its ontological ground. This construction of what it means to be ‘masculinized’ seems to reduce (for example) what Halberstam (1998) calls female masculinities - grounded in lesbian tropes and traditions of enacting gender - to mere imitations or copies of heterosexual masculinity.

Men’s Bodies: Big Brothers Make a Difference

There were no statistically significant differences between the finger-length ratios of the gay-identified and straight-identified men in Williams *et al.*’s (2000) sample. While such findings might refute biological theories of male sexual orientation in some contexts, they did not do so here. Within the sample, men with more than one older brother had significantly shorter finger length ratios than men with no older brothers. (The ratios of men with one older brother was intermediate between these two and appears to be not significantly different from either. These men were not discussed further). Williams *et al.* (2000) cited past findings that straight men have fewer older brothers than gay men (Blanchard, 1997), establishing an indirect link between sexual orientation and finger-length ratios. They cited a genetic theory of male sexual orientation (i.e., Hamer *et al.* (1993) -- but not Rice *et al.*’s (1999) failure to replicate Hamer *et al.*’s

findings). They concluded that gay men’s bodies, like lesbians’ bodies, were produced by high levels of foetal androgens (a variable which they did not, and could not measure).

Although scientific theories ought to be falsifiable, Williams *et al.*’s (2000) reasoning points to discrepancies between Popperian ideals and actual scientific practice. Had the gay men had shorter ratios than straight men, they could also have been described as overly-masculinized (as they were here). Had straight men had shorter ratios than gay men, then gay men could have been described as feminized. It is questionable then if any set of data could have disconfirmed these authors hypotheses that male sexual orientation is biologically determined, or that (already heterosexualized) gender is the best way to describe differences between gay men’s and straight men’s bodies.

Indeed Williams *et al.*’s (2000) data refuted their own theory. In the research cited (i.e., Blanchard, 1997) the number of older brothers that a man has is the key variable predicting his sexual orientation. Williams *et al.*, (2000) reported that ‘only homosexual men had a greater than expected *proportion* of brothers’ (emphasis added) but reported that ‘having older sisters has no apparent influence on male sexual orientation.’ Had they failed to substitute their variable *sibling sex ratio* for the original variable of *number of older brothers* the gay and straight men would have appeared highly similar rather than different (see Table 1).

Table 1: Results of the Williams *et al.* (2000) study for men.

Sexual Orientation	Homosexuals			Heterosexuals		
	n	%	Ratio	n	%	Ratio
No. of Older Brothers						
Zero	132	48	0.958	51	50	0.957
One	89	32	0.955	29	28	0.958
More than one	56	20	0.947	23	22	0.946

Note: n = number of participants, %= percentage of total number of participants within each sexual orientation group, Ratio = 2D:4D finger length ratio. Finger-Length ratios have been estimated from the bar graphs in Williams et al. (2000).

This substitution of related variables appears to have successfully confused several journalists. More than one described the finger-length study as replicating, rather than refuting, Blanchard’s (1997) theory;

The team found that the more older brothers a male subject had, the more likely he was to be gay and the more 'masculine' was his fingertip ratio. (Radford, 2000)

The more older brothers a man has, the more likely he is to be homosexual an observation already made by others and confirmed in this study. (Hawkes, 2000).

In biological research, questions of difference and similarity are typically resolved by statistical significance tests. Williams et al. (2000) also selectively performed statistical tests to materialize an interaction effect involving sexual orientation and birth order among their male participants where none existed. Williams et al. (2000) used the correlation between number of older brothers and finger-length ratios to warrant dividing their male subjects into sexual orientation categories. Within each sexual orientation group they tested for differences between the mean finger-length ratios of men with no older brothers and men with more than one older brother (see Table 1).

A graph of these results in their paper includes the legend 'P<.04' over the bars depicting gay men's finger-length ratios. This legend indicates that, among gay men, the mean finger-length ratio of men without older brothers was significantly larger than that of men with more than one older brother. Over the equivalent bars describing subgroups of straight men the legend reads 'n.s.' indicating a non-significant difference between these two groups. However, as Table 1 shows, the mean ratios for the gay and straight men in each category were almost identical. The significance tests produced different results within the gay and straight groups simply because there were far more gay men than straight men in the study, and so the two tests had unequal power.

Several journalists interpreted Williams *et al.* (2000) as demonstrating that physical differences had been discovered between gay and straight men that had more than one older brother;

It [Williams *et al.*'s (2000) study] also showed that gay men with older brothers had relatively shorter index fingers than other men. (Wilson, 2000)

Lesbian women, and gay men with two or more older brothers, were found to have relatively long ring fingers. (The Age, 2000).

These statements are not incorrect, but they do selectively overlook the straight men with older brothers who had fingers about as long as those of the gay men with older brothers. As such they suggest that only *gay* men with older brothers had smaller 2D:4D ratios, implying an interaction effect of sexual orientation and number of older brothers. However, no such interaction was observed, only a difference in the relative size of the gay male and straight male components of the sample.

Remembering Mothers

This supposed link between sexual orientation and older brothers lead Williams *et al.* (2000) to reiterate Blanchard's (1997) theory that fetal androgens shape men's sexual orientations. Williams *et al.* (2000) typically described lesbians' and gay men's bodies as effects of biological agents; such bodies were 'androgenized', or 'exposed to androgens', etc. In contrast, the bodies of the mothers of gay sons were anthropomorphized as mysterious thinking subjects;

Although it is possible that the maternal influence on finger length growth of subsequent sons occurs after birth, a prenatal influence seems more likely The locus of the maternal 'memory' for previous sons, and the mechanism by which the development of subsequent sons is altered, remains unknown (Williams *et al.*, 2000).

Marc Breedlove, the senior researcher on the finger-length study, supplied several quotes to journalists that similarly constructed mothers' bodies as cognizant and agentic;

For Prof Breedlove, the most intriguing aspect was that the mother's body "remembers" the number of sons she has carried, and somehow tweaks the development of subsequent sons. (Highfield, 2000).

"This means that somehow the mother's body remembers how many sons she has had and exposes each successive male fetus to more androgen" (Newsday, 2000).

'A mother's body appears to alter the foetal development of subsequent sons, increasing the likelihood of homosexuality,' the researchers write. (Radford, 2000).

As Oyama (2000) notes, homunculus theories that endow body parts with cognition confuse biological explanation with metaphor. While

biological systems mutually produce each other when they interact, the attribution of agency and passivity to different biological entities can follow from cultural concerns about the social constituencies that these entities symbolize. For example, classic accounts of conception construct sperm as active and ova as passive within a romantic heterosexual script (Martin, 1991) and differences between men are also evident in accounts of sperm (Moore, in press). The construction of the maternal body as remembering, exposing, altering agent, and of the infant's body as an effect implicitly shifts the agency and responsibility for gay men's sexuality on to their mothers (Ordovery, 1996).

Contradicting Cultural Expectations?

Williams *et al.*'s (2000) claims that gay men's bodies are the results of androgenization does not square with Butler's (1993) notion that lesbian and gay men's bodies are materialized through a 'heterosexual matrix' that casts them as (already heterosexual) gender-inverts. This fact was used to negate the possibility that the study was consistent with cultural assumptions about sexuality and gender;

Although hyper-androgenization of homosexual men might not fit some cultural expectations, homosexual men display several hyper-masculine characteristics, including a greater mean number of sexual partners in a lifetime than heterosexual men, who in turn report more sexual partners than do women of either orientation (Williams *et al.*, 2000).

Similar claims were reproduced in popular accounts;

Testosterone-boosted gays do not fit the feminine stereotype, admits Breedlove. "But homo-sexual men display several hyper-masculine characteristics, including a greater mean number of sexual partners in a lifetime than heterosexual men," he argues (Sydney Morning Herald, 2000).

"This calls into question all of our cultural assumptions that gay men are feminine" said psychologist Marc Breedlove (Donn, 2000).

These claims might suggest that Williams *et al.*'s (2000) study debunks stereotypes, but any such suggestion depends on androcentric thinking; the study inscribes women's bodies within a gender inversion discourse more thoroughly than it challenges the position of men's bodies within it. Moreover, Butler's heterosexual matrix is not the only cultural schema for interpreting gender and sexual difference. As Sedgwick (1990) notes, gay men and lesbians have often been understood as gender separatist and as gender liminal. In past biological research, as here, gay men have been positioned as excessively masculine by virtue of their purported 'promiscuity' (Hegarty, 1997; Treichler, 1991). In stereotyping experiments when gay men are described as 'masculine,' the masculinity in question is often either dismissed or interpreted as a reference to sexual interest (Hegarty & Pratto, 2001). Of course, the attribution of testosterone-boosted, *hyper*-masculinity implicitly references heterosexual men's bodies as the masculine norm against which gay men's are positioned as excessive (Sedgwick, 1990).

Pointing to a Crisis

The Williams *et al.* (2000) study needed no high tech equipment because it relied on a highly visible body part: fingers. This renders the study unlike previous work on brains and genes. Yet the simplicity of the procedure also allows non-scientists to measure any fingers that they have. Journalists frequently constructed their readers' desires to replicate the study on themselves. Williams *et al.* (2000) was reported to have 'sent men and women scurrying to compare their digits' (The Advertiser, 2000), to 'undoubtedly have people around the world comparing fingers and searching for rulers' (Burling, 2000). Readers were cautioned against this desire 'Warning: Reading this story may produce a sudden urge to look at your fingers' (Fauber, 2000).

None of these constructions of sudden urges took note of gender, even though the study produced no significant results for men. Rather, much as Sedgwick (1990) might have predicted, there was something 'indicatively male' about the crisis of homo/hetero definition that was cited and incited. More humorous news articles focused particularly on men's sexualities. One article titled "How handy: They've put their finger on it" concludes with the "Top 10 implications of the Berkeley finger study." None of these 'Top Ten' refers exclusively to women, but three of the items clearly refer to men.

6. Berkeley researchers announce an addendum to their study. Homosexuality is not merely more prevalent in short-fingered gay men who have older brothers, they say. It is more prevalent in long-fingered gay men who have older brothers who constantly hummed *Somewhere Over the Rainbow*.

4. The Boy scouts of America change their three-fingered salute to a simple 'thumbs up' so people won't, you know, check.

1. Women across America examine their husband's fingers. Ten percent break down and sob, "Why didn't you tell me?" (Wilson, 2000)

These jokes seem unintelligible when the genders are reversed. Is there a lesbian equivalent of Judy Garland that straight readers would identify from just an implicit reference? Is the girl scouts structured by detection practices as publicly as the boy scouts? Would a sobbing husband be as funny or gender normative? Is the ten percent figure as legible a reference to lesbians as to gay men? Foucault (1976/78) describes sexuality as an especially dense transfer point where knowledge and power make each other up. Perhaps the androcentrism of this list points to a greater density of this transfer point in regard to men.

Thankfully, scientists are on hand to restore order and to make sure that people won't, you know, check. As often as the urge to look at fingers was referenced, quotations from Marc Breedlove re-routed that urge through statistical representations. Breedlove warned readers of the *Montreal Gazette* that '[t]his is not a test to be used on your friends and neighbours' (Burling, 2000). Elsewhere he opined;

The effects are subtle, so you cannot accurately classify individuals' orientations, or even their sex, based on finger ratios. But the law of big numbers tells us that even such subtle effects, when applied to large populations, will make a difference (Connor, 2000).

The differences in finger length are just fractions of an inch. In addition, the finding is merely a statistical relationship, meaning that there are likely to be many men and women who do not fit the pattern (Hawkes, 2000).

How often does 'the law of big numbers' – the central limit theorem – make it into the newspaper? The invocation of this law lends

Breedlove an authority on the meaning of finger-length ratios. You can't do it on your own, you must aggregate.

I have been arguing that verbal and statistical representations of sexuality in scientific work need to be particularized. However, it would be a mistake to assume that Williams *et al.*'s (2000) 'raw' data is pre-cultural. Aggregate measures of lesbian and gay bodies are easiest to acquire where lesbians and gay men aggregate themselves and feel empowered to disclose their sexual identities to researchers. Past eugenic studies also used public fairs to gain quick access to large groups of measureable bodies for later aggregation (see e.g., Danziger, 1990; Nelkin and Lindee, 1995). Prior to the claiming of public space by the gay liberation movement, scientists critically depended on gay or lesbian assistants to recruit research participants in biometric studies (see e.g., Terry's (1999) description of Jan Gay's work with the Committee for Sex Variants). Regardless of the scientific claims made from such data, its production as an aggregate representation of sexualized bodies is contingent upon social formations of sexuality which are historically particular. Williams *et al.*'s (2000) study is a characteristic cultural product of post-liberation lesbian and gay life.

Conclusions

How does this study of finger-length ratios inform critical accounts of sexuality? There are three principal conclusions from this analysis. First, much as Butler (1993) has argued that physical sex ought to be the privileged site of deconstruction *because* it appears outside of the realm of the political, I want to argue for heightened attention to statistical representations. Such representations often elude attention in critical work on sexuality and are consequently accepted as unmediated 'truth.' In particular, it is important to historicize the means by which queer subjects come to be aggregated and to particularize the verbal and statistical representations that are made up from aggregated data.

Second, Williams *et al.* (2000) shows the continued effects of heteronormativity on professional and popular accounts of the biology of sexual orientation. Differences are consistently ascribed to lesbians and gay men, and (already-heterosexualized) gender provides the schema for describing such differences. Such heteronormativity is not limited to gender-inversion theories. Even when straight men's bodies are theorized as less masculine than gay men's, gay men are described as 'hypermasculine' and straight men as the implicit norm.

Finally, Williams *et al.* (2000) also shows the gendered nature of biological accounts of sexuality. Finger-lengths were correlated with sexual orientation only among women, but both men's and women's sexualities were described as effects of hormonal influences, and men's sexuality became the focus of humorous articles. These asymmetries become all the more salient when one considers that past biological findings about men's sexualities lead to no equivalent elaboration on the sexuality of women (see Hegarty, 1997, Terry, 1997). Tellingly, although both gay men and lesbians were presented as 'masculinized' subjects, this masculinization led to attributions of hypersexuality for gay men, but not for lesbians. However, within discussions of parents of gay men and lesbians, mothers were positioned as agentic while fathers were not discussed. Even when describing lesbian and gay sexualities, biologists continue to rely on (already heterosexualized) gender to script their accounts; biological sexuality remains more of a matter of desire for men, and of reproductive responsibility for women.

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