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A Multidimensional Understanding of the Relationship between Sexual Identity, Heteronormativity, and Sexual Satisfaction among a Cisgender Sample

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Abstract: Contemporary scholarship has begun to focus more on understanding the myriad health disparities (e.g., sexual anxiety, depression) related to sexual identity and its correlates. Sexual satisfaction is linked to many of these disparities, thereby serving as a potentially impactful correlate to understand more deeply in ways that might suggest potential intervention sites to mitigate various disparities. Further, there have also been calls to consider sexual identity multidimensionally beyond only self-identified sexual orientation (LGBQ+ vs. heterosexual) as well as to better understand the role of cultural factors, such as heteronormativity, as correlates of health disparities. Accordingly, this cross-sectional study used internet survey data from 455 cisgender adults of varying sexual identities to test a moderated mediating model linking two dimensions of sexual identity (self-identified sexual orientation and attraction) to sexual satisfaction as mediated by heteronormativity. Results from the multi-group path model analysis were significant for moderation and suggest that heteronormativity mediated the relationship between the attraction dimension of sexual identity and sexual satisfaction only for those who identified as queer (i.e., LGBQ+), whereas attraction was directly related to sexual satisfaction for those that self-identified as heterosexual. Thus, different dimensions of sexual identity have differential impacts on sexual satisfaction and negative impacts of heteronormativity appear significant only for those that identify as queer.

Keywords: heteronormativity; LGBQ; queer; sexual identity; sexual orientation; sexual satisfaction



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1. Introduction

Research focused on understanding the correlates of sexual satisfaction has expanded over the last few decades to include an increased focus on variations in sexual satisfaction across the life course, regardless of relational status, by demographic characteristics and how it is influenced by contextual factors (e.g., sexism, heteronormativity). Conceptually, sexual satisfaction is the extent to which someone is satisfied with their sexual lives individually (e.g., masturbation) and/or relationally (i.e., sexual interactions with one or more others) across psychological, emotional, and physiological domains (e.g., Björkenstam et al. 2020). We note this conceptualization is evolving due to increased scholarly focus, generally, and insights gleaned from the inclusion of more diverse samples (e.g., LGBTQ+ and older adults), more specifically (e.g., Bahamondes et al. 2023; Baldwin et al. 2019; and Pascoal et al. 2019). This is compared to sexual satisfaction's historical conceptualization based on data from (or theories about) largely cisgender, heterosexual men and, to a lesser extent, cisgender, heterosexual women in monogamous partnerships (e.g., Lawrance and Byers 1995).

Generally, sexual satisfaction is a critical component of overall sexual health and is linked to various dimensions of short- and long-term general health and well-being

outcomes—many of these links appear to be bidirectional (e.g., Björkenstam et al. 2020). Accordingly, understanding sexual satisfaction can provide important insights into changes in physical and emotional health. Newer research demonstrates the presence of disparities across many of these health and well-being outcomes as well (e.g., men who have sex with other men [MSM] disproportionately experience HIV diagnoses (Beyrer et al. 2016); there are higher STI rates among queer women compared to non-queer women (Centers for Disease Control [CDC] 2021)), many of which are related to one's social location (e.g., holding one or more minoritized identities). Thus, the study of sexual satisfaction has implications for understanding health disparities and their prevention (Bahamondes et al. 2023). Specifically, it can help practitioners identify potential intervention foci that could help mitigate health disparities and enhance health and well-being, especially sexual health.

Aside from general health and well-being, sexual satisfaction can influence other myriad individual (e.g., life satisfaction and sexual anxiety (Shepler et al. 2018)) and relational outcomes (e.g., relationship stability (Hosking 2012; Velten and Margraf 2017)) and also be influenced by such processes (e.g., Higgins et al. 2011; Lau et al. 2005), suggesting a complex reciprocal relationship at work. For example, extant research most often has focused on links between and variations in sexual satisfaction and sexual functioning (e.g., erectile dysfunction and masturbation (Heiman et al. 2011)), sexual communication (Sprecher and Hendrick 2004), gender disparities (e.g., orgasm gap (Hurlbert et al. 1993)), the context of disease (e.g., cancer and HIV (Glynn et al. 2017)), or behavioral outcomes (e.g., unintended pregnancy (Finer and Zolna 2016)). Although the extant literature suggests an examination of individual and relational factors adequately predicts sexual satisfaction, contemporary studies suggest that a more holistic set of factors spanning bio-psycho-socio-cultural contexts is needed to better understand some of the unique correlates of sexual satisfaction among diverse groups, especially those who are sexual and/or gender minorities and/or women (Fleary et al. 2018; Feinstein et al. 2023; Hambour et al. 2023; Shepler et al. 2018), including those that live in various contexts across the globe (e.g., Gezgin 2023; Pérez et al. 2023). Such factors might include minority stress (Björkenstam et al. 2020), internalized homonegativity (Bahamondes et al. 2023; Shepler et al. 2018), and heteronormativity (Muñoz-Laboy et al. 2014), all of which are linked to sexual satisfaction. However, emergent findings are mixed with some studies finding significant negative links or varying strengths of effect between these variables whereas others do not (e.g., Hambour et al. 2023).

One of the emergent factors, heteronormativity, is a focus here and refers to the culturally normative beliefs that privilege those who are cisgender, heterosexual, and in monogamous first marriages (Kitzinger 2005). Heteronormativity acknowledges the normative and traditional structures ("opposite" sex attraction based on the binary of man/woman) and its difference with emerging structures (same gender or gender diverse attraction; Kitzinger 2005). Queer theorists suggest heteronormativity is an important factor that can help explain sexual health and other health disparities that exist among sexual and/or gender minority populations due to the questioning, or queering, of what society deems 'natural' on the basis of gender and sexuality (Warner 2004; we note that the current study focused only on those that identify as cisgender). Specifically, the extent to which one holds heteronormative beliefs can limit or support someone's sexual orientation self-identification, sexual desires, explorations, and sexual behaviors with themselves and others. When a person does not fit a heteronormative model, heteronormativity can push them to engage in interactions (e.g., sexual interactions) that are less consistent with who one is or refrain from sexual interactions altogether (e.g., Knight et al. 2012; Mark et al. 2018; Muñoz-Laboy et al. 2014). This can undermine health and well-being and appears to be a gendered experience, meaning one's attraction (vs. identity label) plays an important role (e.g., Feinstein et al. 2023; Salomaa et al. 2023).

The nature of the aforementioned mixed findings could be, in part, due to differences in samples (population vs. convenience). However, we contend the mixed findings also could be related to a reliance on a unidimensional approach to conceptualizing sexual identity and new research provides support for this contention (e.g., Bahamondes et al.

2023; Meyer and Elias 2023). That is, most studies use a single-item indicator of sexual identity (i.e., self-identified sexual orientation) whereby a person identifies the identity label that best represents who they are (e.g., bisexual or lesbian) despite research that supports a multidimensional conceptualization of sexual identity comprising orientation, attraction, and behavior, all of which are dynamic and fluid (Kaestle 2019). This can create a conceptual bias and group people artificially. For example, one might identify as heterosexual (orientation) but their attractions and/or behaviors might vary across genders demonstrating a level of queerness in that person's sexual identity that would defy the binary. That is, identity is more nuanced than a single, essentialized label (Meyer and Elias 2023). Furthermore, there is some research that suggests more within group variation compared to that found between groups and studies using only one dimension would likely miss these variations in effects (Fish and Russell 2018; Salomaa et al. 2023). Such potential bias can hide many types of disparities and their correlates, especially given the dynamic and fluid nature of sexuality not captured by identity when measured using sexual orientation labels alone (e.g., Kaestle 2019; Kinnish et al. 2005; Wolff et al. 2017). Research supports these assertions as findings tend to vary across studies based on whether they use attraction, orientation, or behavior (e.g., Mustanski et al. 2014; Paul Poteat et al. 2019; Salomaa et al. 2023). To address these gaps and mixed findings, this study examined how heteronormativity partially mediates the link between sexual attraction and sexual satisfaction and how sexual orientation moderates this link, thereby accounting for interactions between two dimensions of sexual identity (orientation and attraction). We expect each link to be moderated. Additionally, we focus only on those identifying as cisgender rather than also considering variations of gender identity as we believe considering variations of sexual identity, gender identity, and their intersection in a single study would exceed the scope needed to examine nuances in sexual identity and potentially infuse biases into the study, especially methodological ones (Fish and Russell 2018).

1.1. Queer Theory Framework

This study is grounded in queer theory (Butler 1990; de Lauretis 1991; Sedgwick 1990), which aims to reveal implicit normative assumptions (e.g., heteronormativity) that function to maintain a particular social order and oppresses those who fall outside the normative margins of societies and cultures (i.e., those deemed queer). Queer theory questions the "already deeply entrenched set of questionings and abrasions of normality" (Hall 2003, p. 54). The socially constructed ideal that heterosexual orientations and attractions (i.e., attraction only within a binary gender system of opposites) are the 'norm' is deemed oppressive (e.g., Butler 1990; Foucault 1990) and maintains erroneous binaries that are used to maintain an "other". Thus, challenging heteronormativity and uncovering its influence remains the focus of analysis grounded in queer theory (Chevrette 2013). In fact, some new research has expanded the understand of heteronormativity's variations, including across cultures (see Pérez et al. 2023). For example, Orellana et al. (2022) identify multiple profiles of heteronormativity via combinations of beliefs in essentialism and normative behaviors among a Chilean LGBQ sample. One particularly interesting profile included those that disagreed with notions of essentialism, yet their behaviors upheld normative behaviors. Thus, we may challenge and simultaneously perpetuate heteronormativity as an influential cultural script. Actively opposing structures that promote heteronormativity while also dispelling normative and overly simplified assumptions of identity is a fundamental aim of this study. Specifically, this study centers analysis on different aspects of sexual identity (e.g., orientation and attraction) to provide a multidimensional understanding of how cultural scripts of identity (e.g., heteronormativity) influence one's sexual experience (e.g., sexual satisfaction).

1.2. Sexual Attraction and Identity

Historically, and across many cultures, gender and sexuality have been intertwined (sometimes conflated) in ways that help uphold heteronormativity (e.g., society privileging

of heterosexuality and gender conformity primarily focused on the privileged positionality of a cisgender, heterosexual man (Pollitt et al. 2019)). For example, in a study that focused on the attitudes of Turkish men toward queer people, Gezgin (2023) found high levels of intolerance among members of “dominant” social categories (e.g., cisgender and heterosexual) displayed towards anyone who does not perform or identify as cisgender and heterosexual because these performances and identifications challenge heteronormativity, specifically patriarchally based power. Thus, the hegemonic force of heterosexuality (e.g., heterosexual matrix (Butler 1990)) places constraints on how each gender will perform their sexuality (Erickson-Schroth and Mitchell 2009). The way that sexual identity labels historically have been used to understand sexuality suggests a binary, linear conceptualization where it is reduced to a unidimensional concept of sexual orientation (Galupo et al. 2016).

Queer theory supports the complexity of sexual identity by showing where “resistance and active disruption” can occur (Zeeman et al. 2013, p. 104). The significance of sexual identity reduced only to static orientation labels is complicated by queer theory, which challenges whether labels imitate heterosexuality or oppose the ‘heterosexual matrix’ (Butler 1990; Kuru-Utumpala 2013). One belief supporting this claim is the idea that categories are rigid and restrictive, much like heterosexuality; thus, any category of sexual orientation alone would not allow for a fluid and dynamic understanding of sexual identity (Abes and Kasch 2007; Kaestle 2019; Mayo 2013; Meyer and Elias 2023). Given how queer theory posits that sexual identity is multidimensional (Iasenza 2010), the evolution of its scholarly conceptualization (and measurement in quantitative studies) as multidimensional moves the field and our understanding of peoples’ experiences forward (Feinstein et al. 2023; Hammack et al. 2021). That said, in considering the use of queer theory to position sexual identity, we recognize the contradictions of simultaneously being complicit and subversive in incorporating a categorical yet layered view of sexuality (e.g., sexual orientation and attraction) within the context of power relations such as heteronormativity (Varela et al. 2016).

1.3. Sexual Health Disparities

Sexual identities comes with assumed norms, roles, and interests that also are culturally situated (Gezgin 2023; Valocchi 2005; Zhao and Madill 2018). Queer theory highlights the limitations while simultaneously acknowledging the very real effects of normative ‘truths’ that different labels hold, especially when sexual identity is reduced to orientation (Zeeman et al. 2013). Due to the spectrum in how one may identify, these ‘normative truths’ (e.g., thinking categories are binary or permanent) falsely assume ideas about sexual identity. Consequently, new limitations may be introduced in the pursuit of an inclusive categorization of identity. If true, this could help to explain the link between sexual identity and health disparities. Some queer theory researchers have argued that oppressive structures exist because additional categories or descriptors (e.g., “sexual anomalies”) are attributed to those who do not identify as heterosexual (Bionat 2019) or that do but whose behavior and attractions vary from a static understanding of heterosexuality (Orellana et al. 2022). Continuing to view members of a particular sexual minority group as a monolith, which we resist in this study, is one of the major factors prohibiting the understanding and eradication of health disparities (e.g., Hambour et al. 2023).

Medical assumptions and decisions are influenced by heteronormativity that sets standards for expectations and care based on someone’s identity, again often reduced to orientation. For example, a queer theory perspective considers how access to certain services could require the disclosure of one’s sexual identity (e.g., healthcare settings) and compromise one’s ability to receive adequate care because of a provider’s homonegative beliefs. For example, men who have sex with men but identify themselves as heterosexual may receive an inaccurate assessment of HIV risk by a healthcare provider with such limiting beliefs or lack of sexual health knowledge (Matacotta et al. 2020). This could then pose a barrier to effective Pre-Exposure Prophylaxis use among this population. Queer theory then helps researchers to disrupt linear conclusions of a particular phenomenon (e.g., identifying

as a sexual minority increases your chances of experiencing health disparities) and instead considers how we have socially constructed ‘normative truths’ that place restrictions on and increases risk for those who do not align with rigid notions of heterosexuality.

The rigidity of heteronormativity also has implications for sexual satisfaction. For example, higher levels of internalized homonegativity (e.g., experiencing feelings of shame or guilt over one’s sexuality) can mentally create barriers to a healthy and satisfying sex life; specifically, internalized homonegativity has been linked to lower sexual satisfaction (Bahamondes et al. 2023; Baldwin et al. 2019). Shoptaw et al. (2009) found that in a sample of cisgender men who have sex with more than one gender, the highest internalized homonegativity scores came from those who have never been tested for HIV. Those who are bisexual do appear to be most at risk for disparities though (Wolff et al. 2017). This finding is consistent with Rust and Rust (2000) research on bisexuality, which considers the correlation between health disparities and binegativity or biphobia as well as newer research that considered sexual orientation labels and attractions and finds the greatest risk among those that identify and report attractions consistent with bisexuality, pansexuality, and queerness (Feinstein et al. 2023). Experiencing discrimination on the basis of one’s sexuality, bi or otherwise, may further explain the negative impact that perceived lack of social support has on sexual satisfaction among sexual minorities (Björkenstam et al. 2020). Previous studies have found that bisexual men and women are more sexually dissatisfied compared to their heterosexual counterparts, with lesbian women and gay men reporting less sexual dissatisfaction than heterosexual counterparts (Bahamondes et al. 2023; Björkenstam et al. 2020; Mohr and Daly 2008). Furthermore, Rubinsky and Hosek (2020) found a positive correlation between sexual self-disclosure and satisfaction with sex, relationships, and sexual communication. Thus, having supportive social networks to discuss sex and sexuality with may help to reduce health disparities among sexual minorities and lead to higher reports of sexual satisfaction (Parrillo and Brown 2021). The combined findings from these previous studies further helps to contextualize the application of queer theory to examine the extent to which heteronormativity might influence sexual satisfaction.

The lack of studies using a multidimensional approach to understanding health among sexual minorities is problematic and minimizes progress of health goals in the U.S. (e.g., minimizing disparities and identifying prevention strategies (Meyer and Elias 2023)). The complexity of sexual identity as a multidimensional construct also creates difficulties with quantitative analyses and measurement (Wolff et al. 2017). Given the need to further expand on the depth and complexity of sexuality, our study contributes to the understanding of sexual identity by examining how heteronormativity partially mediates the link between two dimensions of sexuality (e.g., sexual attraction and sexual satisfaction) and how this link is moderated by sexual identity (e.g., LGB or non-LGB).

2. Methods

The current study used a cross-sectional internet survey design, a particularly cost-effective and efficient data collection method (Urban and van Eeden-Moorefield 2018). Additionally, online surveys permit anonymity and or confidentiality, ethical considerations critical when studying sensitive topics such as sexuality and/or some historically minoritized populations (e.g., queer). In this way, online surveys can lower potential response bias (Golder and Macy 2014).

2.1. Sample and Procedures

Data for this manuscript came from a larger study (author citation) focused on factors associated with comprehensive sexual health. There were two inclusion criteria for the larger study: all respondents had to be at least 18 years old and identify as cisgender. Individuals who identify under the trans umbrella (e.g., transgender or non-binary) were excluded from this study. We believe there are several unique measurement considerations for this population that would have made a significant number of the current survey questions and measures not applicable in ways that could be interpreted as discriminatory

if asked of trans* individuals (Fish and Russell 2018). This also allowed us to better explore sexual identity variations among one group—those identifying as cisgender. For many existing measures used in the study there also was no known information about their validity when used among trans populations; thus, we believe too much bias could have been introduced.

Respondents were recruited using Facebook posts on the research teams' personal accounts (Gelinas et al. 2017; Pedersen and Kurz 2016). Some direct messaging was also used given not everyone will see a particular post—what shows on someone's news feed is determined by an algorithm as well as if someone is identified as a favorite, thereby prioritizing news feed posts of those who are favorites. The post invited people to participate in the study and provided a link to the informed consent and survey hosted by Qualtrics. We reposted the announcement once every two weeks for six weeks. Using social media is an increasingly used recruitment strategy due to researchers' ability to access large and often difficult to recruit (e.g., sexual minorities (Urban and van Eeden-Moorefield 2018)) populations. However, we note that the diversity of the sampling frame is limited to who has been friended on Facebook by those using their personal accounts for recruitment.

Potential respondents interested in the study clicked the link listed on the recruitment announcement and were taken to the survey, which took about 30 min to complete. Prior to starting the survey, respondents were asked to give their informed consent by selecting "Yes" to the online consent form. Only one survey per IP address was allowed to ensure independence of responses and we asked partnered respondents not to have their partners complete the survey to preserve independence of the data (Birnbaum 2004). At the end of the survey, participants were given the option to be entered into a lottery, in which 40 respondents were randomly selected to receive a \$25 gift card for their participation. Data in this page was stored in a separate data file such that it cannot be connected to anyone's survey responses.

Data used in this manuscript came from a convenience sample of cisgender adults (N = 455). Respondents were placed in one of two groups based on responses to the self-identified sexual orientation question. Of those, 165 were classified as queer (asexual, bisexual, gay/lesbian, pansexual, queer, or respondent write-in term (e.g., omnisexual)) and 291 were classified as heterosexual (i.e., non-queer identified sexual orientation). Because sexual orientation is used as the core moderating factor, demographic and other descriptive statistics are presented separately for each group. Doing so allows for a visual assessment of any potential subsample differences such that difference tests could be run on potential differences to identify controls or other adjustments (e.g., weighting) needed to maintain validity. Table 1 provides the sample demographics. Generally, the sample leaned female, non-Hispanic White, partnered, and mostly educated at or above a bachelor's degree, but with some diversity in income. Although some smaller variations appear in demographic characteristics between subsamples, only one, gender, appears to be vastly different between groups. Specifically, women made up almost 85% of the respondents in the non-queer group compared to almost 45% of the respondents in the queer group.

Table 1. Sample Demographics (N = 455).

Demographic Characteristic		Queer Respondents (n = 165)	Non-Queer Respondents (n = 291)
Age		37.93(SD = 11.48)	34.86(SD = 11.20)
Gender	Cisgender, female	44.80%	84.90%
	Cisgender, male	55.20%	15.10%
Race	Black, Afro-Caribbean, African American	1.33%	2.40%
	East Asian or Asian American	3.60%	1.38%
	Hawaiian, Pacific Islander	0.00%	1.00%
	Latinx, Hispanic, Hispanic American	6.67%	5.50%
	Middle Eastern or Arab American	1.00%	1.03%
	Native American, Alaskan Native	1.33%	2.06%

Table 1. Cont.

Demographic Characteristic	Queer Respondents (n = 165)	Non-Queer Respondents (n = 291)	
Relationship Status	Non-Hispanic White, Caucasian	83.03%	84.54%
	South Asian, Indian American	1.00%	1.00%
	Multiracial	4.67%	2.06%
	No regular partner	32.7%	18.60%
Income	Regular partner	67.30%	81.40%
	Under \$25,000	14.50%	6.90%
	\$25,000–49,999	19.40%	12.40%
	\$50,000–74,999	21.20%	22.10%
	\$75,000–99,999	13.30%	19.30%
	\$100,000–124,999	9.70%	15.50%
	\$125,000 or more	21.30%	23.80%
Education	Did not complete high school	2.40%	0.30%
	High school/GED	6.70%	3.80%
	Some college	9.70%	9.30%
	Associate's degree/Trade degree	6.70%	5.90%
	Bachelor's degree	31.50%	36.10%
	Master's degree	29.10%	30.90%
	Doctorate or other advanced degree above a master's	13.90%	13.70%

2.2. Measurement

Demographic questions were developed for this study by the study authors. Table 1 includes each of the demographics assessed and the response options. Importantly, we followed [American Psychological Association \(2020\)](#) guidelines for using non-biased language to determine when a question wording might need to be slightly altered to reduce its gendered or heteronormative nature (e.g., replace spouse with partner and make a question gender-neutral). Below, we detail measures of the main study variables and related descriptive statistics for them are located in Table 2.

Table 2. Correlation among study variables and descriptive statistics, by group.

Variable	Attraction	Heteronormativity	Sexual Satisfaction
Attraction	-	-0.24 **	-0.00
Heteronormativity	-0.16 **	-	-0.15 *
Sexual Satisfaction	-0.19 **	0.02	-
Mean	1.61(1.28) **	34.65(43.72) **	19.52(20.94) *
SD	0.71(0.45)	14.51(19.09)	7.29(6.70)
Range	2(1)	70(103)	27(24)
Alpha	-	0.87(0.92)	0.94(0.93)

Note: Upper correlations are for queer respondents, lower correlations are for the non-queer respondents. * $p < 0.05$, ** $p < 0.001$. Attraction $t = 5.94(454)$, $p = 0.00$; Heteronormativity $t = -2.07(454)$, $p = 0.04$; Sexual Satisfaction $t = -5.29(454)$, $p = 0.00$.

2.2.1. Sexual Identity

Sexual identity was assessed using two questions developed for the current study that consider two different dimensions (i.e., self-identified sexual orientation (moderator) and attraction (exogenous variable)). The behavioral dimension of sexual identity was not assessed in this study. As stated earlier, sexual orientation was measured using a single item asking about self-identification. Response options included asexual, bisexual, gay/lesbian, pansexual, queer, and a respondent write-in term (e.g., omniseual). Everyone except those who responded with heterosexual were then placed into a queer sexual orientation group; those who responded heterosexual were placed into a non-queer sexual orientation group. Attraction was measured using a single, 5-point Likert scale item asking about the respondent's attraction to others ranging from *only attracted to females* to *only attracted to males*. Consistent with queer theory, we recoded the responses to better assess attraction openness across genders. This resulted in responses being coded as only attracted to one

gender, mostly attracted to one gender, or equally attracted to both genders. Remember, this study excluded those who identify as part of the trans* umbrella so we maintained use of only female and male options for this question so it limits the population studied here and also is a limitation that should be explored in future studies. For those in the queer group, 52.7% indicated attraction to only one gender, 33.9% mostly to one gender, and 13.3% indicated equal attraction to both genders; percentages were 71.8, 28.2, and 0, respectively, for those in the heterosexual group.

2.2.2. Heteronormativity

Heteronormativity was assessed using Habarth's (2015) 16-item *Heteronormative Attitudes and Beliefs Scale*. The items were measured using a 7-point Likert scale ranging from *strongly disagree* to *strongly agree*. Half of the items were reverse-scored. Items were then summed with higher scores reflecting higher heteronormative beliefs. Sample questions included the following: "gender is the same thing as sex, in intimate relationships, people should act only according to what is traditionally expected of their gender". Reliabilities were strong for both groups: $\alpha = 0.87$ for the queer respondents and $\alpha = 0.92$ for non-queer respondents.

2.2.3. Sexual Satisfaction

Sexual satisfaction was measured using the 6-item Rosen et al. (2004) sexual health questionnaire. Items were measured using a 5-point Likert scale ranging from *not at all satisfied* to *very satisfied*. Items were summed with higher scores indicating greater levels of sexual satisfaction. Sample items included the following: (1) How satisfied are you with the sexual relationships you have?; (2) How satisfied are you with the quality of sex life you have? Reliabilities were strong for both groups ($\alpha = 0.94$ for the queer respondents and $\alpha = 0.93$ for non-queer respondents).

3. Data Analysis Plan

Several preliminary analyses were conducted (correlations and test for mean differences in main study variables) to assess for missingness, the appropriateness of the data to test the moderated mediating model in AMOS, as well as to identify the need for potential control variables. AMOS is utilized to explore in depth analysis using structural equation modeling. AMOS test relationships of observed and latent variables. We ran these analyses with the full sample and for each of the two subsamples (queer, and not-queer). Preliminary analyses run among the subsamples allowed us to pay particular attention to potential differences that could influence the validity of the findings. For example, if a measure was much more reliable for one group compared to the other any results would be questionable. Given the extant literature, we expected relationship status and education would be added to the model as controls and both were retained after preliminary analyses. We also expected gender might be used as a control but was not retained after non-significant correlations with study variables.

The full mediating model was run in AMOS without the moderating effect of sexual orientation to assess the baseline model. The ML estimate was used (Schumacker and Lomax 2010), along with 1000 bootstraps that helped assess mediation especially considering data were cross-sectional (Cheong and MacKinnon 2012). Next, the moderator was included and the hypothesized model was tested in AMOS using the multi-group method (Gaskin 2012). We used this method because it captures the unique interaction effects between two dimensions of sexual identity (orientation and attraction) and its influence on the rest of the model. First, the unconstrained model was run which allowed parameter estimates to vary by sexual orientation. Second, the constrained model was run which forced all parameter estimates to be equal across groups. Moderation at the model level was assessed using a χ^2 difference test that examined invariance between groups and the constrained and unconstrained models. After, the model was rerun three times, with a different path constrained each time, leaving the other two paths unconstrained. This

procedure identifies which paths are moderated. Thresholds from the original χ^2 difference test were compared to the three new χ^2 estimates to determine the significance of moderated paths.

4. Results

4.1. Preliminary Findings

For the full sample, correlations were largely as expected. In fact, all variables were significantly correlated with one another with one exception. There was no significant correlation between heteronormativity and sexual satisfaction ($r = -0.01, p = 0.87$). This could be an indication that this link is moderated, thereby also suggesting mediation could be moderated, which would support our hypothesis that the dimensionality of sexual identity differentially impacts sexual satisfaction when interacting with heteronormativity. It, similarly, could be an indication that the hypothesized model may not be supported by the data. Running correlations by group provided additional insight into this. As seen in Table 2, the correlation between heteronormativity and sexual satisfaction was significant for the queer group but not the non-queer group. The reverse was found for the correlation between attraction and sexual satisfaction. These preliminary findings suggest moderated mediation could be present and support proceeding to test the hypothesized model.

Before testing the hypothesized model, we also wanted to test for mean differences between groups for the main study variables. Part of these preliminary analyses also involved identifying potential differences in score distributions that could influence the results. We found no differences between group in kurtosis or skewness for any of the study variables measured at the scale-level. Specifically, kurtosis and skewness scores for heteronormativity, respectively, were 0.41 and 0.90 (queer group) and 0.24 and 0.82 (non-queer group). Kurtosis and skewness scores for sexual satisfaction, respectively, were -0.78 and -0.32 (queer group) and -0.63 and -0.48 (non-queer group).

As noted in Table 2, we did observe significant mean differences by group among all main study variables. Specifically, those in the queer group had higher average attraction openness scores compared to those in the non-queer group, whereas the reverse was true for average heteronormativity and sexual satisfaction scores with higher mean scores found among those in the non-queer group compared to the queer group. Although statistically significant, the mean difference between groups on sexual satisfaction scores does not appear to be meaningfully different.

Finally, we tested the mediating part of the hypothesized model to establish a baseline: $\chi^2 = 196.21$ ($df = 8$), $p < 0.001$. This model did not fit the data well (RMSEA = 0.23; CFI = 0.39; and GFI = 0.88). We note that all path estimates were significant except for the path between heteronormativity and sexual satisfaction, one of the areas in which correlations differed between groups. Thus, it suggests the plausibility that the model works differently across groups. Accordingly, we moved forward with testing the hypothesized model.

4.2. Results for the Hypothesized Model

Figure 1 presents the results from testing the hypothesized multi-group model in AMOS. First, the fully unconstrained model was tested against the data and the χ^2 was entered into Stats Tool Package 4 (Gaskin 2012). Next, a fully constrained model was run. The χ^2 was also entered and the χ^2_{dif} was calculated. Results suggested that moderation was present at the model level, suggesting at least some support for our hypothesis. As seen in the figure among the queer group, as attraction became more open there were decreases in heteronormativity and as heteronormativity increased sexual satisfaction decreased. These links accounted for 19% of the variance in heteronormativity and 11% in sexual satisfaction. There was no significant path between attraction and sexual satisfaction. Among those in the non-queer group, there was a similar influence of increasing attraction openness linked to decreasing heteronormative beliefs. However, there was no significant link between heteronormativity and sexual satisfaction, but there was a significant direct effect of attraction on sexual satisfaction such as attraction openness increased sexual

satisfaction decreased. These links accounted for 13% of the variance in heteronormativity and 23% in sexual satisfaction.

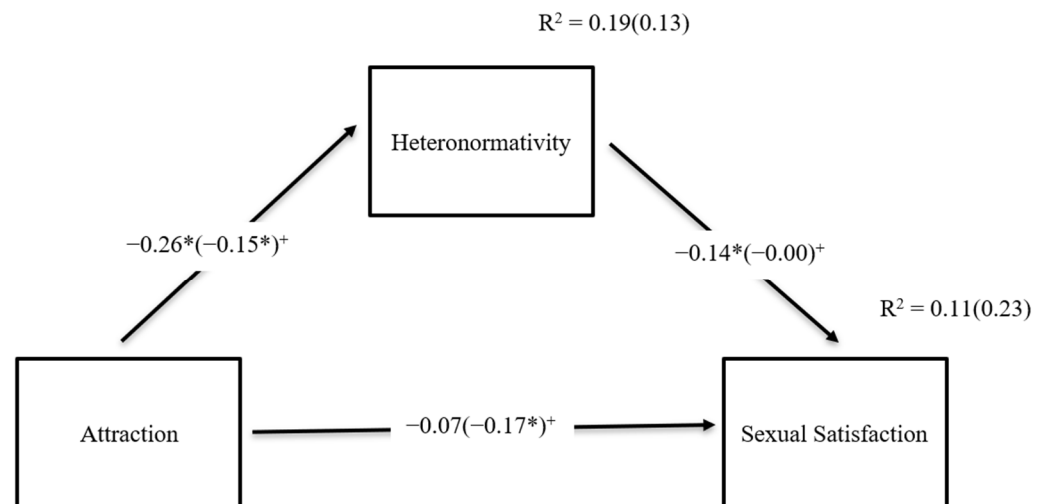


Figure 1. Moderated-mediating model explaining sexual satisfaction (queer and non-queer). Note: Coefficients in parentheses are for the non-queer group. Path coefficients * $p < 0.001$, + path significant for moderation at the 99% confidence level. Moderation present at the model level, $\chi^2_{\text{dif}} = 13.85$ ($df = 6$), $p = 0.03$.

Given some of the differing effects outlined above, we tested moderation at the path level using a path-by-path analysis. We did this by constraining each path independently and compared the new χ^2 estimate to the χ^2 difference thresholds from the original difference test that compared the unconstrained to fully constrained models. These results suggested moderation was presented at the path level for all paths and met standards for the 99% threshold. Finally, we assessed the extent of mediation present in the moderated model. Based on the results already shared and those of bootstrapping, it was clear heteronormativity did exhibit a mediating influence among those in the queer group only. This indirect effect was tested using Stats Tool Package 4 (Gaskin 2012) and a medium indirect effect was confirmed ($f^2 = 0.24$). Further, it seems heteronormativity had a direct effect on sexual satisfaction distinct from its role as a mediator for the queer group as well. Taken together, results suggest the presence of an indirect effect of attraction openness on sexual satisfaction via heteronormativity among those in the queer group, and a direct effect of attraction openness on sexual satisfaction among the non-queer group. This is consistent with our hypothesized model. Among the latter, there was no effect of heteronormativity on sexual satisfaction, which differs from our hypothesized model as we expected a difference in strength if effect rather than no effect and effect.

5. Discussion

Based on the results of this study, there are two key contributions. First, heteronormativity appears to play a mediating role between attraction openness and sexual satisfaction only for those that self-identified as queer; although, there is a negative impact of attraction openness on heteronormativity regardless of self-identified sexual orientation. This could be similar to Orellana et al. (2022) findings of the tensions between essentialism and normativity in distinguishing the profiles of heteronormativity. Additionally, this uncovers some of the nuances of sexual identity's impact due to the use of multiple dimensions (sexual orientation and attraction). Second, attraction openness uniquely predicts sexual satisfaction directly only for those that self-identify as heterosexual and as their attraction openness increases. It could be that these individual's awareness of their non-normative attractions are enough to create negative impacts on sexual satisfaction despite identifying as the normative sexual orientation (heterosexual). There again appears to be similar and unique effects of sexual identity on sexual satisfaction when considering multiple dimen-

sions of sexual identity, effects likely missed in previous studies that relied only on one dimension (see [Kaestle 2019](#) and [Wolff et al. 2017](#) for a discussion). Stated more directly, the dimension of sexual identity determines the pathway (direct or indirect) by which sexual satisfaction is negatively impacted. Should this finding continue to hold true in future studies, it would appear that prevention and intervention efforts aiming to improve sexual satisfaction among those identifying as heterosexual should focus on variations in attraction, whereas those with queer identifying individuals should work with them on navigating sociocultural stigmas (i.e., heteronormative pressures and their internalization).

The negative role of heteronormativity on the lives of queer, cisgender individuals has been theorized for decades now (e.g., [Butler 1990](#); [Warner 2004](#)). However, empirical insight into these impacts has only begun to expand more recently. Available research finds some impact of heteronormativity (or its internalization) and other sociocultural factors (e.g., [Bahamondes et al. 2023](#); [Björkenstam et al. 2020](#); [Muñoz-Laboy et al. 2014](#); [Orellana et al. 2022](#); [Zhao and Madill 2018](#)), but the strength and sometimes nature of the impact is mixed across these studies. Generally, though, it appears the less heteronormative one's identity, expressions, and life is (i.e., the more queer they are) the greater the negative impact of them and the greater the increase in various health disparities, including those related to sexuality, as studied here. In fact, heteronormativity creates conditions that [Varela et al. \(2016\)](#) argue subject anyone who deviates from the norms to "normative violence", which we argue encompasses inequities in sexual health (p. 14). However, the extent to which minoritized populations (e.g., queer individuals) face harmful conditions varies based on other identity markers such as age, race, class, geographic location, dis/ability, and so forth ([Few-Demo and Allen 2020](#)). Given this, the mediating role of heteronormativity for queer-identified individuals in the current study is consistent with theory and the extant literature and adds additional clarity to some of the mixed findings, some of which were explained above. This is especially important given the significant amount of variance accounted in heteronormativity and sexual satisfaction in our results. Additionally, the current results demonstrate an impact on sexual satisfaction, an area of health rarely studied in relation to heteronormativity. It is also important to note that recent research by [Bahamondes et al. \(2023\)](#) also suggests these findings have application to dyadic study and that it is what happens with a partner's heteronormativity that can have the greatest impact on sexual satisfaction but only among cisgender lesbian couples. However, heteronormativity (its internalization) was examined as a direct effect variable rather than a mediator in their study. Future work should continue to explore the use of dyadic data and do so using heteronormativity as a mediator.

Empirical insights of heteronormativity on non-queer identified individuals is rarely studied (e.g., [Knight et al. 2012](#); [Mark et al. 2018](#)), likely based on the assumption that those who identify as heteronormative can more easily navigate a heteronormative world (e.g., [Zeeman et al. 2013](#)). Thus, any potential impact of heteronormativity would be mitigated. The most common exception is the literature on heterosexually identified men who have sex with men (orientation and behavior dimensions of sexual identity) and their HIV risk ([Mat-acotta et al. 2020](#)). The aforementioned assumption found in most of the literature would maintain structural heteronormativity as well, though, given the assumption is based on a binary, a unidimensional sexual identity system (i.e., a sexual orientation label of heterosexual). Existing in a heteronormative world may require heterosexual individuals to remain steadfast in their explicit self-labeling and behaviors as heterosexual as a way of maintaining a 'status quo'. For example, the results from [Gezgin's \(2023\)](#) study of heteronormative attitudes among Turkish heterosexual cisgender men suggest a "strong commitment" to heterosexuality and, by virtue, compliance to nationalism and patriarchal beliefs as a means of maintaining a privileged position in Turkish society (p. 2089). Similarly, in the [Orellana et al. \(2022\)](#) study comprising Chilean university students, heteronormative behaviors and beliefs endorsed by cisgender men who are heterosexual were scored higher compared to cisgender women, non-binary people, and LGBTQ+ groups. In fact, recent research has found a good deal of within group diversity among those that identify as heterosexual

(Kaestle 2019; Salomaa et al. 2023), a diversity missed in most previous research that often relies on limited unidimensional conceptualizations of sexual orientation (Fish and Russell 2018). This is a new area of queerness to explore. That said, we were slightly surprised to see no significant impact of heteronormativity on sexual satisfaction among those that identified as heterosexual despite the significant link between attraction openness and heteronormativity, and, instead, to see a direct link between attraction openness and sexual satisfaction, which is somewhat consistent with Salomaa et al. (2023). It may be that the behavioral dimension of sexual identity is more influential in its interactions with heteronormativity; though, we note the lack of an indirect effect would be consistent with Pascoal et al. (2019) whose thematic analysis of 60 LGB individuals suggested individual and relational factors are more significant predictors of sexual satisfaction among those who identify as heterosexual compared to the role socio-cultural factors play among those who identify as queer. This also is similar to findings from a population-based sample in the Björkenstam et al. (2020) study.

Taken together, it appears that using a multidimensional conceptualization of sexual identity is warranted, even when using two single-item indicator questions. We believe this is reasonable even for use among larger surveys and it would also be reasonable to add at least one behaviorally based sexual identity question so all three dimensions of sexual identity that are captured. However, we caution researchers to define the context of behaviors when adding questions. That is, it would be best when using limited questions to base them on the most recent sexual experience or relationship. When room exists for additional questions, we encourage those that would better assess fluidity of identities as well (Kaestle 2019; Meyer and Elias 2023). Finally, it is clear that heteronormativity continues to have a negative impact on the health and well-being of queer-identified individuals and sexual orientation and attraction openness dimensions of sexual identity are both important to understanding this process as well as identifying areas for prevention and intervention such that health disparities can be mitigated.

6. Limitations

Results from the study discussed above should be considered within the study's main limitations. First, the model included tests of mediation using cross-sectional rather than longitudinal data. We used bootstrapping to mitigate some of the potential issues of doing so (Walker and Smith 2017). Although those results add confidence that mediation is likely present for the queer group they must be viewed as preliminary. Future studies should retest this model with longitudinal data. In doing so, researchers could also include more dynamic measurement of sexual identity, both in terms of orientation and attraction openness considering those can vary over time (Kaestle 2019). A second limitation is the overly reductive approach used to categorize sexual orientation and focus on only cisgender-identified females and males. Several queer orientations included in the sample (e.g., bisexual and queer) did not have enough people in those subsamples needed to test moderation so they were all combined into a queer group. This masks some of the likely within group variability. Accordingly, although we included multiple dimensions of sexual identity in the current study, it remains somewhat artificially categorized (e.g., queer vs. not queer) and attraction openness would be better measured with additional options for a greater representation of variations and fluidity (e.g., Feinstein et al. 2023; Meyer and Elias 2023). The same would hold true for our limited gender focus and future studies should examine these links among the trans* community.

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