

EFFECTS OF RELATIONSHIP CONTEXT AND SOCIAL FACTORS ON
WOMEN'S SOLO MASTURBATION AND VIBRATOR USE

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INTRODUCTION

Throughout much of history, women's sexual desire, pleasure seeking, and sexual self-efficacy have been denied and stigmatized. Male sexuality, however, has yet to face the same degrees of scrutiny and limiting that women have and continue to experience. These gendered differences surrounding sexuality are conceptualized as a sexual double standard, in which an individual's gender regulates their sexual attitudes and behaviors. Generally, the sexual double standard posits that men have greater sexual freedom than women and that society tolerates more sexual behaviors from men (Bordini and Sperb 2013; Crawford and Popp 2003; Gentry 1998; Peterson and Hyde 2011). Many scholars argue that the sexual double standard greatly contributes to the stigmatization of sexual desire among women.

Solo masturbation is one example of a sexual behavior that society has deemed more acceptable for men than women. Ultimately, the sexual double standard may negatively affect women's comfort with fulfilling their own sexual desire through masturbating (Bordini and Sperb 2013; Crawford and Popp, 2003). Peterson and Hyde (2010) conducted a meta-analysis of gender differences in sexuality and found that although most gender differences regarding sexual behaviors and attitudes are small, masturbation is one exception; men consistently report more frequent masturbation than women (Gerressu et al. 2008; Herbenick et al. 2010b; Oliver and Hyde 1993; Petersen and Hyde 2010; Petersen and Hyde 2011). There are various explanations proposed for this gender difference, ranging from higher sex drives among men (Baumeister, Catanese, and Vohs 2001) to under-reporting by women, but no matter what causes this difference, it is one that clearly exists in our society.

Despite the effects of the sexual double standard on women's solo sex behaviors, it is important to acknowledge that although women tend to masturbate less frequently than men, they *do* participate in the behavior (Gerressu et al. 2008; Herbenick et al. 2010b). Today, research suggests that solo masturbation is common among women across the lifespan (Herbenick et al. 2010b), a great leap forward from historical roots connecting female masturbation to the treatment of sexual dysfunction (Meston et al. 2004; Wylie 2007) or hysteria (Maines 1999). Additionally, nearly half (46.3%) of American adult women have ever used a vibrator while masturbating alone (Herbenick et al. 2009). The growing popularity of vibrator use among women could indicate a social shift toward accepting women as more sexually independent (Herbenick et al. 2011a), a move away from women only being sexually fulfilled by their partners, as the sexual double standard may imply.

Partnership status is undoubtedly significant when considering sexual behavior and satisfaction. Although solo masturbation is typically constructed as an individual-level form of sexual behavior, it is necessary to recognize that solo sexual behaviors are often embedded within relationship contexts (Bay-Cheng, Robinson, and Zucker 2009). The sexual/romantic relationship context is often viewed as transformative, as it can play a crucial role in helping women develop a sense of entitlement to sexual desire and pleasure, while establishing positive associations with sexual pleasure seeking (Zimmer-Gembeck, Ducat, and Boislard-Pepin 2011). Interestingly, existing research has typically neglected to examine solo masturbation within the context of relationships, likely due to the fact that it does not depend on a partner to occur. However, this is an important

context to consider since solo masturbation is not a behavior limited to individuals without sexual or romantic partners.

This research aims to address this gap in the literature by taking a sociological perspective on the topic of women's solo masturbation and vibrator use and emphasizing the role of the sexual/romantic relationship context. This research considers solo masturbation at the individual level, as well as within the context of established sexual/romantic relationships, through a sex-positive lens. Adopting a sex-positive lens is helpful for this research, as it will emphasize women's sexual agency and the potential for sexual enjoyment and satisfaction. This ultimately complements the study of women's masturbation and vibrator use by positioning women in charge of their own pleasure and allowing solo sexual activity to be viewed as a positive part of life. Through examining the intersectionality of dyadic relationships, perceptions of societal attitudes toward sexuality, and sexual self-concept, this research will provide a more nuanced understanding of women's masturbatory and vibrator use behaviors and attitudes.

LITERATURE REVIEW

The Sexual Double Standard and Gendered Sexual Scripts

Although sexual attitudes have become increasingly open in recent years, standards of acceptable or expected sexual behavior often continue to vary for women and men (Bordini and Sperb 2013; Crawford and Popp, 2003). These societal standards are commonly known as the sexual double standard – socially-constructed “rules” that direct sexual attitudes and behaviors for men and women. Ultimately, in many cases, the sexual double standard prescribes what sexual attitudes and behaviors women and men are likely to imitate.

There has been significant debate in the literature, particularly in recent years, as to whether a sexual double standard exists in American culture. Conclusions about this have been complicated by the varying operational definitions of the concept and the range of methodologies that have been used to measure it (Bordini and Sperb 2013; Crawford and Popp, 2003). Despite this controversy, many scholars argue that the sexual double standard is a powerful method by which sexual desire and behavior is stigmatized for women. However, this stigmatization seems to be specifically linked to people’s beliefs about the sexual double standard, rather than what they actually experience. Research focusing on beliefs in the sexual double standard has found that the majority of women and men believe it still exists to some degree (Marks and Fraley 2006; Rudman, Fetterolf, and Sanchez 2013). Believing that the sexual double standard exists and that women could be stigmatized for their sexual behaviors may ultimately constrain women’s sexuality.

In acknowledging the potential influence of the sexual double standard, it is important to recognize the link between the manner in which sexuality is constructed and

the sexual outcomes that result. For example, Mestion and Buss (2007) found significant gender differences in regard to why people have sexual intercourse. These differences could reflect how the sexual double standard has become embedded in society. In their study, men were significantly more likely than women to cite the pursuance of physical pleasure, the simple existence of the opportunity for sex, and the potential to improve their social status as reasons for having intercourse. Women were significantly more likely to have sex as a means to feel feminine, to express love, or because they realized they were in love. Although this research focused exclusively on intercourse, similar gender differences may exist relating to solo sex behaviors.

More traditional sexual scripts often connect pleasure seeking and sexual initiation to men, while women are more commonly expected to be passive and take a role as a sexual gate-keeper (Gagnon and Simon 1973). Contemporary research continues to demonstrate these trends, with men having greater allowance and entitlement than women to pursue sexual pleasure (Petersen and Hyde 2010; Zimmer-Gembeck and French 2014) or initiate sex (Dworkin and O'Sullivan 2005). Although the pursuit of sexual pleasure may be more acceptable for men, women certainly are capable of pursuing sexual pleasure, both alone and with partners, and often do. However, scripts of this traditional nature are easily applicable to masturbatory behavior, as Kaestle and Allen (2011) found that young adults hold strongly to sexual scripts pertaining to the appropriateness of masturbation, especially as it relates to gender. Despite the significant progress that society has made, women's solo sexual behavior continues to be stigmatized (Hogarth and Ingham 2009).

Masturbation

Much of the existing literature on masturbation has emphasized the differences between men and women, with consistent findings that men participate in solo masturbation with greater frequency than women (Gerressu et al. 2008; Herbenick et al. 2010b; Oliver and Hyde 1993; Petersen and Hyde 2010; Petersen and Hyde 2011), despite holding similar attitudes toward the behavior (Petersen and Hyde 2010). Aside from findings relating to frequency differences, research has also found that women tend to feel more stigmatized for masturbating than men (Kaestle and Allen 2011), hold more negative attitudes toward masturbation than men (Clark and Wiederman 2000), and rely more heavily on their partner's approval of masturbation than men (Kaestle and Allen 2011).

Older research that addresses women's masturbation has often highlighted negative characteristics such as self-guilt (Kelley 1985), perceived unattractiveness of those women considered as masturbators (Durham and Grossnickle 1982), self-identified feelings of depression after masturbating (Arafat and Cotton 1974), and greater sexual risk-taking (Davidson and Moore 1994). However, recent studies have taken a more positive approach to the subject by linking women's masturbation to sexual satisfaction and positive genital self-image (Herbenick et al. 2011b). Other research has found connections between women's masturbation and heightened self-awareness, more positive body image and self-esteem, and overall sexual pleasure (Coleman 2002; Herbenick et al. 2009; Shulman and Horne 2003).

It is necessary to acknowledge that although women tend to masturbate less frequently than men, they do participate in the behavior, even while in sexual

relationships (Herbenick et al. 2010b; Gerressu et al. 2008). Although this is the case, there is very little research on the roles and functions of masturbation within relationships. Hessellund (1976) is one exception to this. He conducted interviews with 38 married couples regarding their masturbatory and fantasizing behaviors. Hessellund found that masturbation seemed to be connected to the norm of intercourse frequency within each relationship, and for men, masturbation was often used as supplementary to coupled sexual activities, while for women, it was substitutive.

More contemporary research has continued to struggle with the idea that masturbation may serve as a substitute for an absent or unsatisfying partnered sexual relationship, while other research suggests that masturbation can be an integral piece of a full sexual repertoire, including partnered sex, especially for women. This may be due to a lack of clearly scripted norms for female masturbation in society. In a recent study of women's masturbation experiences, Fahs and Frank (2014) began unfolding the complexities surrounding women's masturbation through qualitative interviewing. Based upon the themes they discovered, Fahs and Frank determined that:

a clear disadvantage of not having scripted norms about women's masturbation is that women easily and readily internalize easily accessible, traditional patriarchal scripts, particularly the imperative for penetrative intercourse (manifested here as women's belief that most women self-penetrate), concern about men feeling inadequate or undermined (leading women to masturbate either for a partner's pleasure or in secrecy), and goal-oriented and outcome-oriented labor directed toward orgasm as a product. (P. 248)

Women's Vibrator Use

Because vibrator use is often tied to masturbatory behavior, it is important to consider with the study of women's solo masturbation. In recent years, vibrator use has been identified as common among American women, and this is likely attributable to

issues of both access and exposure (Herbenick et al. 2009). Notably, vibrators have become more widely available in adult bookstores and retail stores, through in-home sex toy parties, and via the internet (Leiblum 2001; Reece, Herbenick, and Sherwood-Puzzello 2004). Despite the surge in vibrator use and access, there is a relatively limited body of literature on this subject.

Although this research examines vibrator use among a majority of heterosexually identified women, it has also specifically been studied among men who identify as gay or bisexual (Reece et al. 2010), among women who have sex with women (Schick et al. 2011), and as it relates to men's use overall (Reece et al. 2009). Herbenick and colleagues (2009) assessed the prevalence and characteristics of women's vibrator use through a nationally representative survey of 3,800 women ages 18-60. The prevalence of women's vibrator use was found to be around 52.5%. They also found that vibrator users were significantly more likely to engage in proactive sexual health measures, including genital self-examination and regular gynecological exams. Additionally, the majority of women who had ever used a vibrator (71.5%) reported never experiencing genital symptoms associated with vibrator use, like pain. Yet, despite this high prevalence of use, relatively little is known about experiences of female vibrator use, especially within the context of relationships.

Davis and colleagues (1996) also researched characteristics associated with vibrator use among women. In this exploratory study, demographic and sexual history correlates of vibrator use were investigated. A diverse sample of 202 women completed a brief questionnaire that allowed them to describe their experiences with vibrator use. Davis et al. (1996) found that vibrators were used primarily to enhance sexual pleasure

and responsiveness, most frequently in solo sexual activity, but also in partnered activity for more than two thirds of the sample. Results from this study were interpreted as emphasizing the value of being capable of enhancing one's own sexual responsiveness and satisfaction; women could do this through solo masturbation with vibrators.

Building upon the descriptive nature of these previous studies, Herbenick et al. (2010a) examined women's vibrator use specifically within sexual partnerships by surveying 2,056 women ages 18-60 in the United States. This study was the first to examine partnered vibrator use among heterosexual, lesbian, and bisexual women via a nationally representative sample. Findings from this study demonstrate that vibrator use is common among sexual partners, that most women's partners know about their vibrator use (and often seem to like it), and that couple dynamics surrounding women's ability to be open about their sexual interests (and be accepted for them) is associated with higher rates of satisfaction.

Taking the literature one step further, Herbenick and colleagues (2011a) also assessed men's and women's beliefs about women's vibrator use using preliminary interviews and surveys of a nationally representative sample of men and women. They found that the majority of women and men ages 18 to 60 years in the United States feel positively about women's vibrator use. Specifically, women and men indicated that they felt that vibrators could contribute positively to sexual functioning (i.e., ease of orgasm) and to the dynamics of sexual relationships, suggesting that vibrator use can be good for women as individuals and as members of relationships.

Beyond the characteristics of vibrator users and its association with positive health behaviors, a recent study examined vibrator and other sex toy use more

subjectively by interviewing twenty women about their feelings and experiences relating to sex toy use (Fahs and Swank 2013). The study found that those women who identified as heterosexual were more likely to believe that most women penetrate themselves with sex toys and that sex toys are threatening to male partners. Bisexual and lesbian identified women more frequently believed that sex toy use was fun and shameless (Fahs and Swank 2013). Although this research is beginning to explore women's qualitative experiences of sex toy use, it is interesting to consider the implications it may have in developing understanding of women's attitudes and behaviors regarding masturbation and vibrator use.

The Sexual/Romantic Relationship Context

It is important to acknowledge that solo sexual behaviors are often embedded within relationship contexts (Bay-Cheng, Robinson, and Zucker 2009) and can influence intimacy with others (Coleman 2002). Wiederman (2005) acknowledges that even within established sexual/romantic relationships, the meanings surrounding various sexual activities (including masturbation) can vary as a function of traditional gendered sexual scripts. The sexual/romantic relationship context is especially interesting to layer with solo sexual behavior because it typically brings with it access to a potential sex partner. If access to a partner were all that mattered in considering solo sexual behaviors, then partnered individuals would have no reason to masturbate, outside of occasions when they could not physically be with their partner. Since this is not the case, understanding the roles of solo sexual behavior within established sexual/romantic relationships is key.

Beyond this, sexual/romantic relationship contexts are crucial to consider because they are often formative in individual development; they can impact nearly every realm

of an individual's life. Collins, Welsh, and Furman (2009) conducted a review of the literature pertaining to adolescent romantic relationships. They determined that romantic relationships, especially those that occur in adolescence or early adulthood, can contribute greatly to personal identity formation and sexual development.

Furthermore, a study of young women's (ages 16-25) sexual subjectivity, conceptualized as perceptions of bodily pleasure and associated self-esteem and personal agency in the sexual realm (Zimmer-Gembeck, Ducat, and Boislar-Pepin 2011), found that the relationship context may be especially important for helping young women develop a sense of entitlement to sexual desire and pleasure. The authors suggest that these elements of sexual subjectivity often depend on interactions with sexual/romantic partners, so the relationship context could be crucial for helping women establish positive associations with sexual pleasure seeking. For example, Zimmer-Gembeck and colleagues (2011) found that young women who had established sexual/romantic relationships throughout the course of their research had higher sexual subjectivity than those women who did not have a steady partner.

Sexual Self-Concept

Sexual self-concept is conceptualized as the creation, development, and refinement of a sense of self as a sexual person (Rostosky et al. 2008; Snell 1998). Recent literature emphasizes the normality of this dynamic process and its multidimensional nature; sexual self-concept is key to building understanding of sexual identity (Hensel et al. 2011; Rostosky, Dekhtyar, Cupp and Anderman, 2008; Snell 1998). It has also been argued that sexual self-concept development facilitates the organization and direction of future sexual and romantic relationships (Hensel et al., 2011; O'Sullivan, Meyer-Bahlburg, and

McKeague 2006), which is important to keep in mind when studying sexual self-concept in conjunction with sexual/romantic relationship contexts.

One dimension of sexual self-concept is sexual esteem. This component involves an individual having constructive evaluations of their sexuality (Snell 1998), as well as positive perceptions of their body in the sexual context (Horne and Zimmer-Gembeck 2006). Recent research has connected higher sexual esteem with greater oral sex frequency, higher number of sexual partners, and more time spent in established romantic relationships (Maas and Lefkowitz 2014). Sexual openness, another component, involves recognizing sexual arousal and pleasure and feeling entitled and compelled to pursue sexual activities (Horne and Zimmer-Gembeck 2006). Additional forms of entitlement, sexual entitlement to pleasure from the self or from a partner, can also be included in understanding sexual self-concept (Horne and Zimmer-Gembeck 2005). Recent research has found that although men have greater entitlement to self-pleasure, women actually have higher sense of entitlement to sexual pleasure with partners (Zimmer-Gembeck and French 2014). This finding may be especially important to consider when exploring the various factors surrounding women's masturbation and sexual relationships.

A final component, sexual anxiety refers to an individual's negative evaluations of their sexual life and general uneasiness relating to sexuality (Snell 1998). Among American adolescent women, sexual anxiety has been associated with stronger abstinence beliefs, lower sexual readiness, fewer reports of established sexual/romantic relationships, and less frequent reports of kissing, sexual fondling, or intercourse (O'Sullivan et al. 2006).

Sexual self-concept emphasizes the role of the individual in defining their own sexuality and sexual self, even though it certainly is created and exists within societal and relational contexts. Although the components of sexual self-concept can be examined individually, the interactions between them help form the most complete and complex understanding of sexual processes. For example, Hensel and colleagues (2011) examined the various interactions between components of sexual self-concept and sexual behavior. They found that sexual anxiety was primarily associated with lower coital frequency, yet increase in sexual openness and decline in sexual anxiety were both linked to increased coital frequency over time. This is just one example of the intricate and reciprocal relationships between sexual self-concept and sexual behavior. Ultimately, sexual self-concept is an important piece in fully understanding the mechanisms that work together to define a person's sexual attitudes and behaviors.

THEORETICAL FRAMEWORK

Sexual Script Theory (SST) (Gagnon and Simon 1973) will provide the theoretical framework for this study. Generally, script theory is built on the idea that people follow internalized scripts to create and understand the meanings of their experiences, behaviors, and feelings. Scripts are socially-constructed, largely unconscious cognitive devices that direct action and organize behavior. In regard to sexual situations, scripts provide direction and meaning for responding to specific cues and behaving sexually.

In society, sexual scripts help define the range of what is appropriate in terms of sexual expression, action, and roles. Conceptualizing sexual behaviors and attitudes as scripted allows for the consideration of the cultural and social contexts in which sexuality exists and is shaped. Taking a sexual scripting approach helps guide focus beyond the literal sexual behavior in question to the societal rules that help organize it (Gagnon 1990; Gagnon and Simon 1973; Simon and Gagnon 1986; Simon and Gagnon 2003). Considering this research within the framework of SST allows for the examination of how women's behaviors and attitudes might connect or disconnect with socially-constructed sexual scripts, particularly those that relate to women's masturbation practices.

Simon and Gagnon (1986) assert that for sexual behavior to occur, scripting must exist on three levels: cultural scenarios, the interpersonal level, and the intrapsychic level. These levels of scripting can be thought of as an inverted pyramid, with more emphasis being placed on personal agency as you move down from the societal-level influences at the top. Cultural scenarios refer to the overarching instructional guides that shape social life. At this level, one's culture sets the stage for what roles exist and how those roles are

expected to be enacted. Scripting at this level is often viewed as ambiguous and abstract; these are unwritten rules that exist but are difficult to define clearly (Simon and Gagnon 1986).

Next, interpersonal scripts represent an individual's adaptation of cultural scenarios as they see fit for specific contexts. Within this level of scripting, actors are not simply doing what is expected of a role; they are also negotiating their roles as they pertain directly to other people and different situations. These scripts transform the actor from a mostly passive receptor of social rules (seen at the cultural scenario level) to a more active participant with the ability to modify existing scripts within their own personal social interactions (Gagnon 1990; Simon and Gagnon 1986). Interpersonal scripts demonstrate the increasing role of personal agency within the scripting progression, as the individual has the ability to affect outcomes based on their experiences. In relation to this research, interpersonal scripting is especially important when considering the context of sexual/romantic relationships. For example, sexual pleasure seeking and solo sex behavior have often been scripted as being less acceptable for women. However, as this level of scripting suggests, a woman has the ability to adjust and adapt this scripting based on her own experiences and the interactions she has with others.

Finally, intrapsychic scripting is a dynamic process of inner rehearsal within the self. It is at this level of scripting that individuals have the ability to account for cultural scenarios, interpersonal scripts, and their own desires that may exist beyond those bounds. Intrapsychic scripting is a complex internal process that connects individual desires and experiences to social meanings. Scripting at this level helps people form a

concept of an autonomous self that exists outside of (although inherently within) cultural scenarios and interpersonal scripts (Simon and Gagnon 1986). This level of scripting is the most agentic in nature, with the individual having further control over their mental processes.

As Simon and Gagnon (1986) claim, each of these layers of scripting comes together to influence sexual behavior. For the purposes of this research, SST is a fitting theoretical framework because it appropriately recognizes that sexual behavior and attitudes do not exist in a social vacuum. SST demonstrates the power of society and culture, interactions with others, and the self on an individual's behaviors and views pertaining to sexuality.

CURRENT STUDY

Significance

This research aims to examine the impact of various factors, including societal-level influences, components of the sexual/romantic relationship context, and sexual self-concept, on women's solo sex attitudes and behaviors. Most broadly, this research is significant because sexuality plays an important role in overall health. Much research has connected sexual activity with positive physical, mental, emotional, and social health outcomes (Brody 2010; Coleman 2002; Hensel et al. 2011; Hogarth and Ingham 2009; Levin 2007; Zimmer-Gembeck and French 2014), ranging from improved muscle function, to mood and esteem elevation, to greater self-reported relationship quality and sexual well-being. However, health outcomes specifically associated with masturbation are mixed. This is likely attributable to the various social factors that frame masturbation more negatively than other sexual behaviors, especially for women. This research serves as an additional piece of evidence to help clarify the mixed information that speaks to women's masturbation.

In addition, this research is significant because there is very little existing literature that examines the topics of women's solo masturbation and vibrator usage in a way that highlights the importance of both sexual agency and the relational context. Most research emphasizes one perspective or the other, individual-centered sexuality or partnered sexuality. It is important to link these ideas together to allow for a more complete range of women's sexual experiences: women can have sexual agency *and* participate in solo sexual activity within a satisfying relational context. Although there is currently a growing body of literature relating to both masturbatory habits and vibrator use, relatively few studies have explored the role that women can play in creating sexual

pleasure for themselves, even when they have access to an established partner. Findings from this study provide a unique layer to the body of literature on these subjects, which could contribute to improvements in women's sexual and relational health through better informed educational and therapeutic practices.

Furthermore, examining how masturbation and vibrator use interact within the relational experiences of couples may contribute to better understanding about the roles of masturbation within established relationships. Gaining knowledge of the interactions and roles of solo sex within relationships is important because it can be used to help couples navigate a significant component of their sexual lives, while continuing to empower women. Since vibrator use and masturbation are so frequently linked, and because vibrator use and masturbatory behaviors are commonly present within relationships, this research aims to tease out how these components interact. Through examining the influence a woman's partner and relationship context can have on her masturbatory behaviors, this research provides a new perspective on how relational factors may shape a woman's solo sexual activities, even when she has access to a potential sexual partner.

Although women undoubtedly are capable of sexual agency, some sexual choices, including those regarding solo masturbation or vibrator use, may be negotiated within the relationship context. Determining how a woman's sexual partner and relationship context may impact her masturbatory behaviors may help create an opportunity for more effective health care, education, and even marketing strategies, thereby expanding our knowledge of sexual topics and improving women's overall sexual health. Furthermore, this research has the potential to debunk social myths and (re)construct scripts that

pertain to masturbation, vibrator use, and women's sexual attitudes and behaviors, which could ultimately impact personal relationships, counseling practices, educational programs, and marketing strategies for sex industries.

Specific Aims

The primary objective of this research is to understand if and/or how partnership status and the sexual/romantic relationship context impact a woman's behaviors and attitudes toward masturbation and vibrator use. To explore these effects, this research has four specific aims:

1. Describe and analyze participant characteristics, both overall and stratified by partnership status, including demographic information, solo masturbation attitudes and behaviors, vibrator use attitudes and behaviors, sexual self-concept, belief in the sexual double standard, and partnership-specific material;
2. Investigate how societal-level expectations (i.e., belief in the SDS, social acceptability of masturbation and vibrator use) might influence women's masturbatory and vibrator use attitudes and behaviors;
3. Examine how relationship factors, including partnership status, perceptions of partner's views of masturbation and vibrator use and partner communication, may influence women's masturbatory and vibrator use attitudes and behaviors; and
4. Illustrate how sexual self-concept, conceptualized as sexual anxiety, sexual openness, sexual entitlement, and sexual esteem, contributes to women's masturbation and vibrator use attitudes and behaviors.

Hypotheses

The overarching research question of this project asks if and how partnership status and the relationship context impact a woman's behaviors and attitudes toward masturbation and vibrator use. More specifically, this research will test five hypotheses that account for societal, relational, and individual influences on sexual attitudes and behaviors.

Hypothesis 1: More positive societal-level views of sexuality (i.e., low belief in the SDS, social attitudes and acceptability toward masturbation and vibrator use) will be associated with more frequent solo masturbation and vibrator use and more positive attitudes and outcomes regarding masturbation and vibrator use.

The first hypothesis confronts the potential effects of perceptions of societal expectations on individual behavior and attitudes toward masturbation and vibrator use. This hypothesis aims to demonstrate the relationship between the societal-level measures, including belief in the sexual double standard and societal-level acceptance of masturbation and vibrator use, and participant-level behavior and attitudes. Because beliefs about gender and sexuality are influenced by and embedded within socio-cultural contexts, it will be insightful to explore the relationship between these societal-level measures and individual attitudes and behaviors.

Hypothesis 2: More positive partner perceptions will be associated with greater frequency of masturbation and vibrator use and more positive attitudes and outcomes relating to masturbation and vibrator use.

Hypothesis 3: Partner communication regarding masturbation and vibrator use will be associated with greater frequency of masturbation and vibrator use and more positive attitudes and outcomes relating to masturbation and vibrator use.

The second and third hypotheses will examine the effects of relational factors associated with having an established sexual/romantic partnership on women's masturbation and vibrator use behaviors and attitudes. To elaborate, hypotheses two and three aim to uncover the impact that a woman's perceptions of her partner's opinions on and communication about masturbation and vibrator use may have on her own attitudes and behaviors. This is important to test because research and popular opinion suggests that men may feel threatened or intimidated by women's vibrator use, and potentially masturbation more generally (Fahs and Frank 2014; Fahs and Swank 2013; Herbenick et al. 2011). Because of this, some women may choose not to disclose their vibrator use to their partner because of distress over intimidating or offending him (Herbenick et al. 2010a). Interestingly, Herbenick and colleagues (2011) discovered that the majority of women and men they surveyed did not agree with this sentiment, and significantly fewer men did than women. This finding may suggest that women have more concerns about their male partners' reactions to their vibrator use than men actually have themselves. Testing this further will be helpful in gaining greater understanding for the relational mechanisms that may influence solo sex behaviors and attitudes.

Hypothesis 4: More positive sexual self-concept will be associated with more frequent masturbation and vibrator use, as well as more positive attitudes and outcomes relating to masturbation and vibrator use.

Hypothesis four will test the importance of sexual self-concept in connection to masturbatory and vibrator use behaviors and attitudes measured at the individual-level. The goal of this hypothesis is to determine how these behaviors and attitudes may vary by sexual self-concept. This hypothesis asserts that women with more positive sexual self-concepts will likely have more frequent and positive masturbation and vibrator use experiences than those with less positive sexual self-concepts.

METHODS

This research utilizes data drawn from a larger Internet based, cross-sectional survey examining health and life experiences of adult men and women in the United States. Eligibility for participation included being 18 years of age or over and English speaking. No specific health conditions or life experiences were required as enrollment criterion, and no identifying personal information were collected as part of the survey, allowing participants to remain anonymous. All data were entered and stored on REDCap, an external password-protected, web-based survey collection platform permitting the building and management of online surveys and databases, as well as the secure downloading of data in a variety of formats. Upon completion of the study, participants were offered the option to leave an email address that would be entered in a drawing to win one of ten, \$10.00 electronic gift cards. The Institutional Review Board at Indiana University – Purdue University Indianapolis reviewed and approved all protocols associated with this study.

Participants

Participants were recruited for the original study in January and February 2015 through a combination of convenience and snowball sampling methods. Study personnel posted recruitment advertisements on a variety of social media in different professional and academic networks. These advertisements provided a brief description of the study purpose, eligibility for participation, possible compensation, and a link to the study website. Potential participants visiting the study website were given additional details about the study and a link to initiate informed consent to begin the secure, web-based survey. Individuals completing the survey additionally re-circulated recruitment

advertisements on social media within their own networks. For the current paper, all female participants with a documented partnership status were retained (N=112).

Measures

Although expansive content areas were addressed within the larger questionnaire, this research includes only select content areas that were deemed most appropriate for the aims of this investigation.

Demographic characteristics

Demographic data is utilized to provide an accurate depiction of the sample being studied. Information on age, race/ethnicity, education level, relationship status, and sexual orientation are assessed. These data serve as descriptive details or controls within this research.

Partnership status

Partnership status is a variable created for the purposes of this research to indicate if a participant currently has or does not have an established sexual/romantic relationship partner. This measure was produced by transforming the original seven-category measure of relationship status into a binary of “single” or “partnered.”

Masturbation behaviors and attitudes

Several measures relating to solo masturbation behaviors and attitudes are included in this research. Individual-level questions assess frequency of masturbation (see below), satisfaction of masturbation (measured on a 5-point scale of “very dissatisfying” – “very satisfying”), and comparison of masturbatory frequency to the perceived frequency of others (measured on a 5-point scale of “lower than most” – “higher than most”),

Partner-specific items assess partner's knowledge of participant's masturbation (measured with "yes", "no"), communication with partner regarding masturbation (measured with "yes" or "no"), comfort discussing sexual topics with partner (measured on a 5-point scale of "completely comfortable" – "not at all comfortable") perceived comfort of partner with participant's masturbatory habits (measured on a 5-point scale of "completely comfortable" – "not at all comfortable"), and if a participant has ever chose to masturbate alone over being sexual with a partner ("yes" or "no").

Vibrator use behaviors and attitudes

Individual-level and partner-specific data were also collected with respect to vibrator use behaviors and attitudes. Individual-level questions evaluate participant's vibrator ever-use (measured with "yes" or "no") and current use (measured with "yes" or "no"), frequency of vibrator use for masturbation (see below), satisfaction with vibrator use for masturbation (measured on a 5-point scale of "very dissatisfying" – "very satisfying"), and comfort with own vibrator usage (measured on a 5-point scale of "completely comfortable" – "not at all comfortable").

Partner-specific questions help determine partner's knowledge of participant's vibrator use for masturbation (measured with "yes", "no"), communication with partner regarding vibrator use (measured with "yes", "no), and perceived partner comfort with participant's vibrator use (measured on a 5-point scale of "Completely comfortable" – "Not at all comfortable").

Masturbation and vibrator use frequency

Masturbation frequency is measured with a single seven-category item assessing the frequency of solo masturbation among participants. For analysis purposes, this item

was collapsed to four categories, ranging from “never” to “more than once per day.” Vibrator use frequency is measured with a single 5-point item to evaluate the rate of vibrator use for solo masturbation, with choices spanning from “never” to “every time.” This item was collapsed to three categories for analyses.

Masturbation and vibrator use positivity

Masturbation and Vibrator Use Positivity is an index variable scale composed of seven measures including: masturbation frequency, satisfaction with masturbation, frequency of orgasm from masturbation, masturbation frequency compared to others, vibrator ever-use, current vibrator use, vibrator use frequency, satisfaction with vibrator use, and comfort with own vibrator use. This scale is used to assess degrees of positivity associated with solo masturbation and vibrator use (such that higher frequency, greater satisfaction, current vibrator use, and higher orgasm frequency are considered positive). Those items pertaining to vibrator use were only measured in participants that answered “yes” to ever using a vibrator for solo masturbation. This scale has moderate reliability with a Cronbach’s alpha of 0.680.

Sexual double standard

Belief in the sexual double standard is measured with a 10-item, five-point scale first developed by Caron and colleagues (1993). All items in this scale are close-ended and use answer choices ranging from “strongly agree” to “strongly disagree.” A Cronbach’s alpha level of 0.847 suggests sufficient scale reliability for this sample. The items in this scale were coded such that higher scores indicate lesser belief in the SDS.

Societal-level acceptance

This original measure of societal-level acceptance relating to masturbatory and vibrator use behaviors is composed of six close-ended items using a five-point scale of choices ranging from “completely acceptable” to “not at all acceptable.” Questions for this measure assess attitudes regarding the social acceptability of masturbation for single women and men, masturbation for women and men in relationships, vibrator use for masturbation, and vibrator use for sexual activities with a partner. Reliability analyses in this sample demonstrated adequate reliability with a Cronbach’s alpha of 0.857.

Partner perceptions

Partner perceptions is an index variable scale composed of four original items. These include partner comfort with masturbation (a measure of the participant’s partner’s comfort with the participant’s solo masturbation), partner comfort with vibrator use (a measure of the participant’s partner’s comfort with the participant’s use of a vibrator for masturbatory purposes), partner knowledge of masturbation (a measure of the participant’s partner knowing about their masturbation), and partner knowledge of vibrator use (a measure of the participant’s partner knowing about their vibrator usage). Reliability analyses in this sample indicated sufficient reliability ($\alpha=0.735$).

Partner communication

Partner communication is another original index variable scale and is comprised of six items. Measures include comfort discussing sexual topics with a partner, talking about masturbation with a partner, discussing vibrator use with a partner, talking specifically about the participant’s masturbation with a partner, partner’s knowledge of

participant's masturbation, and partner's knowledge of participant's vibrator use. This scale is sufficiently reliable, with a Cronbach's alpha level of 0.784 in this sample.

Sexual self-concept

Sexual self-concept was conceptualized in two ways for the purposes of this research: as individual scales, including measures of sexual anxiety, sexual esteem, sexual openness, sexual entitlement, and sexual entitlement relating to partners, and as a multidimensional scale comprised of each individual scale listed here. The sexual anxiety scale (Hensel et al. 2011) is made up of five four-point items with a Cronbach's alpha value of 0.792 for this sample. This scale was coded to reflect higher scores as representing less sexual anxiety. Sexual esteem is also a five-item, four-point scale (Hensel et al. 2011) with high reliability ($\alpha=0.906$) in this sample. The sexual openness scale (Hensel et al. 2011) is composed of six items, and has a Cronbach's alpha of 0.816 for this sample. Sexual entitlement, a four-item scale (Horne and Zimmer-Gembeck 2005), and sexual entitlement relating to partners, a three-item scale (Horne and Zimmer-Gembeck 2005), had high reliability within the sample ($\alpha=0.854$ and $\alpha=0.941$, respectively). All scales utilized Likert-type items assessing level of agreement from "strongly disagree" to "strongly agree." The multidimensional scale, a sum of each of the before mentioned scales, is referred to as the sexual self-concept scale. This scale had moderate reliability within the sample, with a Cronbach's alpha of 0.624.

Analyses

All analyses were conducted using SPSS, v. 22.0. Descriptive statistics, including frequencies and means (where applicable), are used to describe participant demographic characteristics, masturbation and vibrator use behaviors and attitudes, sexual self-

concept, partner-specific characteristics, and other associated measures. All scales were evaluated for reliability by calculating a Cronbach's alpha, as mentioned in the measures descriptions. Bivariate relationships were assessed via crosstabulations, chi-square, and analysis of variance (ANOVA) tests.

RESULTS

Participant Demographic, Attitudinal, and Behavioral Characteristics (Aim 1)

Tables 1, 2, and 3 present participant characteristics, both overall and by partnership status. Table 1 presents participant demographic characteristics and is found on page 31. Overall, the average age of participants was approximately 29.35 years ($SD=9.953$). The majority of participants were White (85.7%), heterosexual (87.5%), had some college education or a Bachelor's degree (70.5%), and had established sexual/romantic partnerships (75.9%). Twelve participants (10.7%) identified as bisexual, as well as two (1.8%) who identified their sexual orientation as "other," and these women were included in all analyses due to lack of information about partner gender.

Participants' frequency of solo masturbation was fairly heterogeneous, with 19.0% masturbating a few times per week, 38.1% masturbating a few times per month, and 24.8% masturbating a few times per year. 54.3% of participants indicated that they had ever used a vibrator for masturbation (ever-users), and 38.3% identified as current vibrator users. Of those participants who had ever used a vibrator for masturbation, nearly half (49.0%) use one almost every time or every time they masturbate. Additionally, over half (51.0%) of vibrator users felt that masturbation with a vibrator is very satisfying, and 76.5% are completely comfortable with their own vibrator use.

Regarding the various aspects of sexual self-concept, average sexual esteem (13.25, $SD=3.55$) and sexual entitlement (13.24, $SD=2.64$) fell in the upper-mid range of their respective scales. Participants had a mean score of 8.54 ($SD=2.28$) on the sexual entitlement with a partner scale, placing them in the high entitlement range. For sexual openness, participants' average score was 16.79 ($SD=3.26$), suggesting mid-level openness. Finally, belief in the SDS was low, with a mean score of 42.29 ($SD=6.26$) out

of a possible 50 (note that higher scores indicate lesser belief), and sexual anxiety was also fairly low, falling at 15.28 (SD=3.02) out of a possible score of 20. Reference Table 2 on page 32 for complete details on masturbation, vibrator use, and sexual self-concept characteristics.

Table 1. Participant Demographic Characteristics

	Total Sample (N=112)	Single (N=28)	Partnered (N=85)
Age (Mean, SD)	29.35 (9.953)	27.11 (10.27)	30.06 (9.81)
Race (Yes: N, %)			
American Indian/Alaska Native	-	-	-
Asian or Asian American	2 (1.8)	1 (3.7)	1 (1.2)
Multiple Races	9 (8.0)	2 (7.4)	7 (8.2)
Native Hawaiian or Other Pacific Islander	-	-	-
Black or African American	6 (5.4)	5 (18.5)	1 (1.2)
White or Caucasian	96 (85.7)	19 (70.4)	77 (90.6)
Other	2 (1.8)	1 (3.7)	1 (1.2)
Prefer not to answer	2 (1.8)	-	2 (2.4)
Hispanic or Latino (Yes: N, %)	10 (9.3)	1 (3.8)	9 (11.0)
Education Level (N, %)			
High school or GED	7 (6.3)	3 (11.1)	4 (4.7)
Some college, tech school, or Associate's	50 (44.6)	12 (44.4)	37 (43.5)
Bachelor's degree	29 (25.9)	5 (18.5)	25 (29.4)
Some graduate school	3 (2.7)	2 (7.4)	1 (1.2)
Graduate degree	23 (20.5)	5 (18.5)	18 (21.2)
Sexual Orientation (N, %)			
Straight/Heterosexual	98 (87.5)	25 (92.6)	73 (85.9)
Gay, Lesbian, or Homosexual	-	-	-
Bisexual	12 (10.7)	2 (7.4)	10 (11.8)
Asexual	-	-	-
Other	2 (1.8)	-	2 (2.4)
Relationship Status (N, %)			
Single and not dating	11 (9.8)	11 (40.7)	-
Single and dating more than one person	8 (7.1)	8 (29.6)	-
Single and dating one person	8 (7.1)	8 (29.6)	-
In a relationship with one person, not living together	19 (17.0)	-	19 (22.4)
In a relationship with one person, living together, not married	21 (18.8)	-	21 (24.7)
Married and living together	45 (40.2)	-	45 (52.9)
Married but not living together	-	-	-
Partnership Status (N, %)			
Single	27 (24.1)	27 (24.1)	-
Partnered	85 (75.9)	-	85 (75.9)

Table 2. Masturbation, Vibrator Use, and Sexual Self-Concept Characteristics

	Total Sample (N=112)	Single (N=28)	Partnered (N=85)
Frequency of Self-Masturbation (N, %)			
I've never done this	10 (9.5) ¹	2 (9.1)	8 (9.6)
Every few years	3 (2.9) ²	-	3 (3.6)
A few times per year	26 (24.8) ²	4 (18.2)	22 (26.5)
A few times per month	40 (38.1) ³	8 (36.4)	32 (38.6)
A few times per week	20 (19.0) ³	4 (18.2)	16 (19.3)
Once per day	6 (5.7) ⁴	4 (18.2)	2 (2.4)
More than once per day	-	-	-
Satisfaction of Solo Masturbation (N, %)			
Not at all satisfying	3 (3.2)	1 (5.0)	2 (2.7)
Somewhat unsatisfying	6 (6.4)	1 (5.0)	5 (6.8)
Neutral	4 (4.3)	1 (5.0)	3 (4.1)
Somewhat satisfying	43 (45.7)	10 (50.0)	33 (44.6)
Very satisfying	38 (40.4)	7 (35.0)	31 (41.9)
Comparison of Masturbation Frequency to Others (N, %)			
Lower than most	31 (33.3)	5 (25.0)	26 (35.6)
Slightly lower than most	19 (20.4)	3 (15.0)	16 (21.9)
Same as most	30 (26.8)	9 (45.0)	21 (28.8)
Slightly higher than most	11 (9.8)	3 (15.0)	8 (11.0)
Higher than most	2 (1.8)	-	2 (2.7)
Vibrator Ever-Use (Yes: N, %)	51 (54.3)	12 (60.0)	39 (52.7)
Vibrator Current Use (Yes; N, %)	36 (38.3)	10 (50.0)	26 (35.1)
Frequency of Vibrator Use for Solo Masturbation (N, %)			
Almost never	7 (13.7) ⁵	-	7 (17.9)
Sometimes	19 (37.3) ⁵	5 (41.7)	14 (35.9)
Almost every time	15 (29.4) ⁶	4 (33.3)	11 (28.2)
Every time	10 (19.6) ⁶	3 (25.0)	7 (17.9)
Satisfaction of Solo Masturbation with a Vibrator (N, %)			
Not at all satisfying	-	-	-
Somewhat unsatisfying	3 (5.9)	1 (8.3)	2 (5.1)
Neutral	5 (4.5)	1 (8.3)	4 (10.3)
Somewhat satisfying	17 (33.3)	5 (41.7)	12 (30.8)
Very satisfying	26 (51.0)	5 (41.7)	21 (53.8)
Comfort with Own Vibrator Use (N, %)			
Not at all comfortable	-	-	-
Somewhat uncomfortable	-	-	-
Neutral	3 (5.9)	-	3 (7.7)
Somewhat comfortable	9 (17.6)	4 (33.3)	5 (12.8)
Completely comfortable	39 (76.5)	8 (66.7)	31 (79.5)
Societal-Level Acceptability (on scale 4-24), (Mean, SD)	18.89 (2.35)	19.13 (2.20)	18.82 (2.39)
Sexual Esteem (on scale 5-20), (Mean, SD)	13.25 (3.55)	13.13 (4.38)	13.28 (3.31)
Sexual Entitlement (on scale 4-16), (Mean, SD)	13.24 (2.64)	13.17 (2.83)	13.26 (2.60)
Sexual Entitlement with Partner (on scale 3-12), (Mean, SD)	8.54 (2.28)	8.82 (2.52)	8.46 (2.22)
Sexual Openness (on scale 6-24), (Mean, SD)	16.79 (3.26)	16.83 (3.10)	16.78 (3.33)
Belief in the SDS (on scale 10-50), (Mean, SD)	42.29 (6.26)	42.17 (7.91)	42.32 (5.77)
Sexual Anxiety (on scale 5-20), (Mean, SD)	15.28 (3.02)	14.70 (3.24)	15.45 (2.95)

Superscripts 1-6 noted above indicate categories that were combined for analyses, such that superscript 1 was its own category, 2 was composed of two categories, etc.

Table 3 presents participants' partner-specific responses and can be found on page 33. It is important to note that all participants responded to this category of questions, despite their current partnership status. Those participants who identified as single may have responded based on a previous, current (dating), or hypothetical partner. Overall, 65.9% of participants said that their partner knew about their solo masturbation, and among vibrator users, 85.4% of women indicated that their partner was aware that they used a vibrator for masturbation. 80.4% of respondents had ever discussed masturbation with a partner, and 84.0% had talked about vibrator use with a partner. Moreover, 59.3% of respondents felt that their partner was either somewhat or completely comfortable with their masturbation habits, while among vibrator users, partners were most often perceived as completely comfortable with the use of a vibrator for masturbation (63.0%).

Table 3. Partner-Specific Characteristics

	Total Sample (N=112)	Single (N=28)	Partnered (N=85)
Partner Knowledge of Solo Masturbation (Yes: N, %)	60 (65.9)	11 (61.1)	49 (67.1)
Perceived Partner Comfort with Your Masturbation (N, %)			
Completely uncomfortable	5 (5.8)	1 (6.3)	4 (5.7)
Somewhat uncomfortable	8 (9.3)	1 (6.3)	7 (10.0)
Neutral	22 (25.6)	4 (25.0)	18 (25.7)
Somewhat comfortable	9 (10.5)	2 (12.5)	7 (10.0)
Completely comfortable	42 (48.8)	8 (50.0)	34 (48.6)
Discussed Masturbation in General with Partner (Yes: N, %)	74 (80.4)	11 (61.1)	63 (85.1)
Discussed Your Masturbation with Partner (Yes: N, %)	52 (56.5)	10 (55.6)	42 (56.8)
Discussed Your Partner's Masturbation with Partner (Yes: N, %)	60 (65.2)	12 (66.7)	48 (64.9)
Ever Masturbate Instead of Partnered Sexual Activity (Yes: N, %)	31 (33.3)	4 (21.1)	27 (36.5)
Partner Knowledge of Vibrator Use for Solo Masturbation (Yes: N, %)	41 (85.4)	8 (88.9)	33 (84.6)
Perceived Partner Comfort with Your Vibrator Use (N, %)			
Not at all comfortable	5 (10.9)	1 (12.5)	4 (10.5)
Somewhat uncomfortable	2 (4.3)	-	2 (5.3)
Neutral	7 (15.2)	1 (12.5)	6 (15.8)
Somewhat comfortable	3 (6.5)	-	3 (7.9)
Completely comfortable	29 (63.0)	6 (75.0)	23 (60.5)
Discussed Vibrator Use with Partner (Yes: N, %)	42 (84.0)	8 (72.7)	34 (87.2)

Finally, several analyses of variance (ANOVA) models were conducted to increase understanding of the bivariate relationships among variables. See Table 4 below

for significant findings. A one-way ANOVA determined that masturbation and vibrator use positivity varied significantly based on masturbation frequency, such that those with the lowest frequency of masturbation had significantly lower masturbation and vibrator use positivity than those with mid-level ($p < .001$) and the highest frequency of masturbation ($p = .036$). Masturbation and vibrator use positivity also varied significantly by vibrator use frequency. Finally, societal-level attitudes toward masturbation and vibrator use were determined to vary by masturbation frequency, such that those with the lowest frequency of masturbation had significantly less positive attitudes toward masturbation and vibrator use than those with mid-level ($p < .001$) and the highest frequency of masturbation ($p = .015$).

Table 4. Aim 1 ANOVA Summary

	DF	F	p
Masturbation/Vibrator Use Positivity * Masturbation Frequency	(2, 47)	12.546	<.001
Masturbation/Vibrator Use Positivity * Vibrator Use Frequency	(1, 48)	7.950	.007
Societal-level Attitudes * Masturbation Frequency	(3, 100)	6.700	<.001

Impact of Societal Expectations (Aim 2)

The goal of Aim 2 was to investigate how societal-level expectations (i.e., belief in the SDS, social acceptability of masturbation and vibrator use) might influence women’s masturbatory and vibrator use attitudes and behaviors. The hypothesis coupled with this aim anticipated that lower belief in the SDS and higher perceptions of social acceptability of masturbation and vibrator use would be associated with more frequent masturbation and vibrator use, as well as greater masturbation and vibrator use positivity. See Table 2 on page 32 for descriptive information specific to this aim.

First, a one-way ANOVA was conducted to determine if masturbation and vibrator use positivity differed significantly based on a participant’s degree of belief in the SDS. The analysis of variance indicated a non-significant difference between groups,

suggesting that degree of belief in the SDS does not significantly vary with a participant's level of positivity toward masturbation and vibrator use in this sample. Analysis of variance was also used to assess the relationship between societal-level acceptance and masturbation and vibrator use positivity, and this test was also not significant.

Further analyses were conducted to explore the associations between belief in the SDS, societal-level acceptance, masturbation frequency, and vibrator use frequency. After recoding belief in the SDS into categorical quartiles, no significant relationship was found between belief in the SDS and masturbation frequency ($X^2[df]=7.260[9]$; $p=.610$) or vibrator use frequency ($X^2[df]=1.781[2]$; $p=.410$). However, a significant relationship was found between societal-level acceptance and masturbation frequency ($X^2[df]=20.644[6]$; $p=.002$), yet there was not a significant relationship between societal-level acceptance and vibrator use frequency.

Impact of Relationship Factors (Aim 3)

The purpose of Aim 3 was to examine how relationship factors, including partnership status, perceptions of partner's views of masturbation and vibrator use, and partner communication may influence women's masturbatory and vibrator use attitudes and behaviors. Analyses examining effects of partnership status were exploratory and were not predicted with an initial hypothesis. The hypotheses connected with this aim predicted that more positive partner perceptions and communication would be associated with more frequent masturbation and vibrator use and greater masturbation and vibrator use positivity. Reference Table 3 on page 33 for descriptive statistics pertaining to this aim.

Analyses were conducted to compare participants by partnership status on a variety of measures. When examining belief in the SDS by partnership status, there was no significant difference between single and partnered women. No significant differences were found between single and partnered participants with masturbation frequency, vibrator use frequency, partner communication, or partner perceptions. Single and partnered women also did not have statistically significant differences in sexual anxiety, sexual openness, sexual entitlement, sexual entitlement with a partner, sexual esteem, overall sexual self-concept, societal-level acceptance, and masturbation and vibrator use positivity, although sexual esteem was approaching significance ($p=.054$).

A one-way ANOVA with a post hoc Tukey HSD test was conducted to determine if masturbation and vibrator use positivity differed significantly based on masturbation frequency, controlling for partnership status. The analysis of variance indicated a significant difference in masturbation and vibrator use positivity between levels of masturbation frequency among partnered participants, but not among single participants [$F(2, 35)=15.424, p<.001$]. Tukey's HSD post hoc test suggested that among partnered women, those masturbating the least had significantly lower masturbation and vibrator use positivity than those masturbating more frequently ($p<.001$), and those masturbating the most had significantly higher masturbation and vibrator use positivity than those masturbating the least ($p=.024$).

After categorical recoding of the partner perceptions scale and the partner communication scale, ANOVA was used to examine the following relationships: partner perceptions and masturbation and vibrator use positivity, partner perceptions and masturbation frequency, partner perceptions and vibrator use frequency, partner

communication and masturbation and vibrator use positivity, partner communication and masturbation frequency, and partner communication and vibrator use frequency. All tests were non-significant, with the exception of partner communication and masturbation and vibrator use positivity [$F(26, 20)=2.648, p=.014$].

Crosstabulations and a chi-square test were used to assess the relationship between partner comfort with masturbation and vibrator use and masturbation and vibrator use frequency. Results suggested that a partner's comfort with the participant's masturbation was not significantly related to masturbation frequency ($p=.301$), and degree of partner comfort with vibrator use was not significantly related to masturbation frequency ($p=.473$) or vibrator use frequency ($p=.484$).

Impact of Sexual Self-Concept (Aim 4)

The goal of Aim 4 was to illustrate how sexual self-concept, conceptualized as sexual openness, sexual entitlement, sexual entitlement with a partner, and sexual esteem, contributes to women's masturbation and vibrator use attitudes and behaviors. The hypothesis linked to this aim anticipated that more positive sexual self-concept would be associated with greater frequency of masturbation and vibrator use. For this portion of analyses, sexual self-concept was tested for its individual scales only, rather than also with the combined index scale. See Table 2 for sexual self-concept descriptive statistics (p. 32). Crosstabulations and chi-square tests were run to examine bivariate trends among the components of sexual self-concept with masturbation and vibrator use frequency. Table 5 below provides chi-square values and significance information, with significant results noted by an asterisk. Interestingly, only two combinations were statistically significant – greater sexual openness and sexual entitlement were associated with higher

masturbation frequency ($X^2[df]=18.922[9]$; $p=.048$; $X^2[df]=15.281[6]$; $p=.018$, respectively).

Table 5. Chi-square and Significance Values for Masturbation and Vibrator Use Frequency by Sexual Self-Concept Components

	Masturbation Frequency	Vibrator Use Frequency
Sexual Openness	18.922 (9), $p=.048^*$	5.437 (3), $p=.142$
Sexual Entitlement	15.281 (6), $p=.018^*$.047 (1), $p=.811$
Sexual Entitlement with Partner	9.094 (6), $p=.168$.057 (2), $p=.972$
Sexual Esteem	3.554 (9), $p=.938$	2.139 (3), $p=.544$

DISCUSSION

This research evaluates if and how social factors, partnership status and the sexual/romantic relationship context, and individual-level factors impact a woman's behaviors and attitudes toward masturbation and vibrator use. This project specifically frames the topics of women's solo masturbation and vibrator usage in a way that highlights the importance of both sexual agency and the relational context in order to better understand the full spectrum of what might contribute to these attitudes and behaviors. In conjunction with the chosen theoretical framework, SST, this research was structured in a manner that reflects the sequence of the three levels of scripting: cultural scenarios, the interpersonal level, and the intrapsychic level (Simon and Gagnon 1986). Following this structure led to the analysis of societal expectations, relationship factors, and sexual self-concept on women's masturbation and vibrator use attitudes and behaviors.

Study participants were a homogeneous group, with a majority being White, heterosexual, college-educated, and partnered. Similar to existing research (Herbenick et al. 2009; Herbenick et al. 2010a), 54.3% of participants identified as vibrator ever-users (for masturbation), and 38.3% indicated that they were current vibrator users. Existing nationally-representative research posits that 46.3% - 52.5% of women are vibrator ever-users, and 20.1% have used a vibrator in the past month (Herbenick et al. 2009; Herbenick et al. 2010a). The slightly higher rates of vibrator use for this study are reasonable considering the non-representative nature of the sample and their self-selection into the project. Additionally, partner knowledge of vibrator use aligned almost perfectly with the extant literature (Herbenick et al. 2010a), with around 86% of users indicating that their partner knew about their vibrator use.

The first hypothesis was associated with societal expectations and anticipated that lower belief in the SDS and higher perceptions of social acceptability of masturbation and vibrator use would be associated with more frequent masturbation and vibrator use, as well as greater masturbation and vibrator use positivity. With overall low belief in the SDS and fairly high perceptions of social acceptability within this sample, paired with a lack of significant results in associating societal-level factors to solo sex attitudes and behaviors, these findings could suggest that society is continuing to shift away from the SDS and gendered sexual scripts in favor of gendered sexual equality (Bordini and Sperb 2013; Crawford and Popp, 2003).

Existing literature suggests that *belief* in the SDS matters more than experiencing consequences of it (Marks and Fraley 2006; Rudman et al. 2013), and in response, Fetterolf and Sanchez (2015) pose that women may resist sexually agentic behavior in order to avoid being connected with the associated characteristics of sexual agency (e.g., selfishness, greater number of partners). Results from this study pertaining to this realm are not clear, but they may suggest that low belief in the SDS does not significantly alter a woman's agentic sexual attitudes and behaviors, including those toward masturbation and vibrator use.

To explore the impact of partnership status, the sample was stratified into single and partnered groups and examined for significant differences among a variety of factors. Single and partnered women did not significantly differ in masturbation frequency, vibrator use frequency, partner communication or partner perceptions, sexual anxiety, sexual openness, sexual entitlement, sexual entitlement with a partner, sexual esteem, overall sexual self-concept, societal-level acceptance, and masturbation and vibrator use

positivity. These findings may suggest that partnership status alone does not dictate characteristics of this nature. Although it is often assessed, most existing research on similar topics has not emphasized partnership status as an important factor. Results from this study may serve to inspire future research to consider partnership status as a central component to studying sexual attitudes and behaviors, especially in relation to solo sex.

This research elicited only one statistically significant difference between single and partnered women; only partnered women had masturbation and vibrator use positivity that varied significantly between levels of masturbation frequency. Single participants did not, suggesting that masturbation frequency may be more closely impacted by social norms and expectations, and possibly by the role of partnered sexual activity, when performed in the context of established relationships.

The next two hypotheses related to relationship factors and predicted that more positive partner perceptions and communication would be associated with more frequent masturbation and vibrator use and greater masturbation and vibrator use positivity. All tests relating to these hypotheses were non-significant, with the exception of an analysis of variance between partner communication and masturbation and vibrator use positivity. These results make it difficult to confidently determine if relationship factors play a role in shaping a woman's masturbation and vibrator use attitudes and behaviors, although they may suggest that these partner-centered factors play little to no significant role in influencing solo sex attitudes and behaviors. It is important to note that these mixed results and interpretation align with existing research, such that there is contention over how partner knowledge, communication, and support of partner masturbation and

vibrator use play out within relationship contexts (Fahs and Frank 2014; Fahs and Swank 2013; Herbenick et al. 2011).

The fourth hypothesis, linked to sexual self-concept, anticipated that more positive sexual self-concept would be associated with greater frequency of masturbation and vibrator use. After assessing the relationships between individual components of sexual self-concept with masturbation and vibrator use frequencies, two combinations produced statistically significant results – greater sexual openness and sexual entitlement were associated with higher masturbation frequency. These findings align with expectations motivated by existing literature, considering that sexual openness and entitlement are associated with recognition of sexual pleasure and feelings of empowerment to pursue specific sexual activities (Horne and Zimmer-Gembeck 2006). These findings may also support current literature as they demonstrate the positive relationship between sexual behavior and components of sexual self-concept (Hensel et al. 2011; Maas and Lefkowitz 2014). Interestingly, these results may supplement Zimmer-Gembeck and French's (2014) findings, which posit that men have greater entitlement to self-pleasure (masturbation) and women have greater entitlement to sexual pleasure with partners. Because this research focuses specifically on solo masturbation, it is important to acknowledge that women can have sexual entitlement directed toward themselves through masturbation or toward a partner.

In sum, these findings highlight the complexity surrounding women's masturbation and vibrator use attitudes and behaviors. Several factors, including those that stem from society, relationship contexts, and the individual, are embedded within each other and work together to contribute to how a woman feels and acts in regard to

solo sex. The results from this study suggest that women are capable of sexual agency in relation to masturbation and vibrator use, whether they are in established partnerships or not.

Limitations and Strengths

This investigation is limited in several ways. First, it is limited by the sampling bias of relying on a sample of convenience, rather than a randomized sampling methodology. This limits the potential for generalizability due to the homogeneity of the sample. Additionally, this project relied on a fairly small sample size of only 112 women, with an uneven distribution between single and partnered participants. Also related to the sample, those who voluntarily participate in sexuality research are likely to be more open, and often more liberal, regarding sexual topics. This may bias results in a more positive direction than what is actually representative of all women. This research is also limited by the potential for participants to have difficulty recalling and appropriately reporting frequencies relating to masturbation, vibrator use, and orgasm. This recall bias could result in skewed data that falls short of reflecting the actual frequencies of these behaviors among the women who participate (Coughlin 1990). Finally, this project was limited by relying only on descriptive and bivariate analyses.

Despite these limitations, this study has several strengths worth noting. Primarily, this research was inspired by and formulated in theory and was structured in a manner that reflected the configuration of SST. This project is also one of few to examine a typically individual-level sexual behavior, solo masturbation, and frame it socially, relationally, and individually. Not only was this key to connecting this project to theory, but it also allowed for a more complete exploration of the spectrum of factors that

influence a woman's solo sex behavior. Finally, by using multidimensional measures, this research expanded the potential of bivariate analyses by accounting for a more realistic and multifaceted understanding of human behavior, attitudes, and experiences.

Future Research

There is considerable opportunity for future research to expand and refine the literature addressing women's solo sex and the factors that may contribute to a woman's associated attitudes and behaviors. Use of multidimensional models, as well as multifaceted variables, could more effectively capture the complex nature of these processes. Item, scale, and model development to assess masturbation and vibrator use attitudes and behaviors and influential factors could be beneficial in establishing new ways of conceptualizing and measuring these intricate processes. In relation to these suggestions, future research could examine any additional factors that contribute to an individual's sexual self-concept and relationship context to better understand where these concepts originate. Multivariate analysis would also help in creating a more nuanced understanding of the contributions of societal-level, relationship-level, and individual-level factors to women's attitudes and behaviors toward masturbation and vibrator use. Also important for future research is utilizing qualitative research methods to further examine single and partnered women and men on similar topics. This would help to narrow and refine the material needed for future quantitative work on topics including masturbation, vibrator use, sexual self-concept, and social and relational factors.

CONCLUSION

In conclusion, solo masturbation and vibrator use for masturbation are common among adult women, even when they are in established sexual/romantic relationships. Notably, societal factors, relational components, and sexual self-concept all contribute to a woman's solo sex attitudes and behaviors. Furthermore, relating specifically to the relationship context, holding positive perceptions of a partner's comfort with masturbation and vibrator use, as well as having open sexual communication within a relationship, may contribute to developing a sex-positive relationship environment that is supportive of women's solo sex activities.

This research aimed to build upon and clarify existing knowledge of the complex relationships between women's solo masturbation and vibrator use behavior and attitudes and society, the sexual/romantic relationship context, and sexual self-concept. Although there is an abundance of existing research on solo masturbation, and a growing literature relating to vibrator use, this research helps to bring extant knowledge on these topics together in a way that furthers understanding of women's masturbation and vibrator use, especially while considering the relationship context.

Results from this research help create a more holistic understanding of the factors and processes that shape women's solo sex behaviors and attitudes. Because current knowledge surrounding these topics is convoluted at best, this research is an important step toward understanding women's intimate sexual experiences. This research may help reduce the existing stigma and taboo surrounding women's masturbation, which may ultimately improve women's sexual and general health, their sexual/romantic relationship experiences, and their overall quality of life.

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Subjectivity with Global and Sexual Well-Being: A New Measure for Young Males and Comparison to Females." *Archives of Sexual Behavior* 1-13.

CURRICULUM VITAE

Ashley Reneé Sherrow

Education

August 2015 | Indiana University, Indianapolis, IN

M.A. in Sociology with a concentration in Human Sexuality and Health

Thesis: “Effects of Relationship Context and Social Factors on Women’s Solo Masturbation and Vibrator Use”

Committee: Devon Hensel, Ph.D. (Chair)

Carrie Foote, Ph.D.

Kenzie Latham, Ph.D.

December 2012 | Ball State University, Muncie, IN

B.S. *magna cum laude* in Integrated Studies: Human Sexuality & Interpersonal Health, a major composed of psychology, communications, health science, education, and counseling courses

Honors Thesis: “Contraception and Culture: What Society Says and How Women Are Impacted”

Advisor: Gary Pavlechko, M.A.

Instructional Experience

Course Assistant

Spring 2014 | Indiana University-Purdue University Indianapolis

Assisted Professor Devon Hensel, Ph.D., in Sociology of Human Sexuality undergraduate course, contributed to development of syllabus, exams, and writing assignments, served as guest lecturer

Guest Lecturer

Spring 2012 | Ball State University

Developed and presented HIV/AIDS lecture, emphasizing HIV 101 and social factors; Course: Interrelational Aspects of Sexuality, Department: Counseling Psychology

Teaching Assistant

Spring 2012 | Ball State University

Assisted Professor Heather Adams, Ph.D., in Psychology of Women undergraduate course, graded written work, met with students upon request, collaborated to update course curriculum, attended weekly meetings with professor

Guest Lecturer

Summer 2011 | Ball State University

Developed and presented HIV/AIDS lecture, emphasizing HIV 101 and social factors; Course: Psychology of Sexual Behavior, Department: Psychological Science

Teaching Assistant

Fall 2010 – Fall 2011 | Ball State University

Assisted Professor Ronald Truelove, M.A., in Introduction to Psychological Science undergraduate course, graded written work, met with students upon request, led periodic study sessions

Publications & Presentations

2015 | Hensel, Devon, Amanda E. Tanner, and Ashley Sherrow. (In Review).
“Adolescent Women's Condom Use During Bleeding-Associated Vaginal Sex.” *Journal of Adolescent Health*.

April 2015 | IUPUI Research Day

Poster presentation, “Women’s Individual and Relationship-Level Attitudes and Behaviors Regarding Solo Masturbation and Vibrator Use”

July 2011 | Posi(+)-ive Empowerment Showcase, Ball State University

Presented to university and community members regarding Posi(+)-ive Empowerment, an Immersive Learning project on HIV/AIDS

July 2011 | National LGBTI Health Summit, Indiana University, Bloomington, IN

“College Students Making A Difference in the Community: Development of an HIV Support Group and Resource Guide”

June 2011 | Step-Up, Inc. Community Action Group Retreat, Indianapolis, IN

Guest presenter, “Posi(+)-ive Empowerment”

June 2011 | Damien Center, Indianapolis, IN

Guest presenter, “Posi(+)-ive Empowerment”

Memberships & Awards

2011 – Present | Safe Zone, student member, Ball State University

Voluntary network of allies and advocates for the LGBTQI community

2009 – 2012 | Ball State University Honors College member

2009 – 2012 | Ball State University Presidential Scholarship

2009 – 2012 | Honors Dean’s List recognition (GPA of 3.5 or higher)

Training & Certifications

September 2014 | HIV Today: What Everyone Needs to Know

Online certification provided by California STD/HIV Prevention Training Center

August 2013 | Collaborative Institutional Training Initiative (CITI), Indiana University-Purdue University Indianapolis

Social and Behavioral Research Basic Course for ethical research involving human subjects

May 2011 | HIV Core Facts Training and Certification, Muncie, IN

Training and certification provided by The Indiana State Department of Health, The Indiana Family Health Council, and Step-Up, Inc.

May 2011 | Safe Zone Training, Ball State University

Extensive concept and sensitivity training to become an ally and advocate for the LGBTQI community

Research & Related Experience

Research Assistant

August 2013 – Present | Indiana University-Purdue University Indianapolis

Assist Professor Devon Hensel, Ph.D., with data entry and analysis, research design, and survey and manuscript construction for research regarding sexual health, sexual and contraceptive behaviors, and sexual relationships

Hostess and Event Planner

Spring 2012 | “HIV+ in Central Indiana: A Look at Our Past, Present, and Future,” Ball State University

Assisted in planning event details and organizing community publicity for an event featuring Jeanne White-Ginder (mother of Ryan White) and a panel of people living with HIV or working in related industries

Intern

Summer 2011 | Meridian Health Services, Muncie, IN

Organized HIV focus group to assess community needs, helped develop and lead support group for HIV positive community members, researched, wrote, and edited resource guide including medical, basic needs, and miscellaneous resources for community members living with HIV/AIDS