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SEXUAL DISORDERS (LE MARSHALL AND H MOULDEN, SECTION EDITORS)

Assessing Paraphilic Interests Among Women Who Sexually Offend

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Abstract

Purpose of Review We examine the state of scientific research on the assessment of paraphilic interests among women who have committed sexual offences.

Recent Findings Research on the assessment of sexual interests in women using genital measures shows little evidence, overall, that women's genital responses are indicative of sexual interests. Some non-genital measures of sexual interest may be a valid indicator of age interests. Very few studies have focused on women who sexually offend.

Summary At this time, there is no validated measure that can be used to assess paraphilic interests among women who sexually offend. Much research is needed to determine if some measures (other than self-report) could validly assess a variety of sexual interests in women in general, and women who sexually offend in particular (e.g. interest in children, interest in sexual violence). This research is needed to determine if paraphilic interests are involved in women's motivation for sexual offending, and to determine if such interests are predictive of sexual recidivism.

Keywords Women who sexually offend · Paraphilic interests · Sexual interest testing · Genital response · Forensic assessment · This article is part of the Topical Collection on *Sexual Disorders*

Introduction

The presence of paraphilic interests is among the factors that increase men's risk for sexual offending (reviewed in [1–4]). A *paraphilic interest* is defined as sexual arousal to an atypical sexual target (e.g. prepubertal children) or sexual activity (e.g. sexual violence). When paraphilic interests are longstanding, persistent, and necessary for sexual enjoyment, and result in significant harm, distress, or impairment in functioning, they constitute a *Paraphilic Disorder* [5, 6]. For men who sexually offend, the assessment of paraphilic interests with genital and non-genital measures is an integral part of the evaluation of motivation for offending and of risk for recidivism, particularly because self-report of paraphilic interests may be influenced by a reluctance to disclose.

The penile plethysmograph is used to assess sexual arousal to a variety of sexual stimuli and is a valid measure of sexual interests (e.g. [7]). Meta-analytic findings show that penile responses are predictive of sexual recidivism for men with sexual interests in children (i.e. pedophilia; [8]). There is evidence in some studies that penile responses are predictive for other types of sexual offending as well (reviewed in [2, 3]). Given the utility of the penile plethysmograph for assessing pedophilic and other sexual interests of men who sexually offend, several authors have considered whether measures of genital response could also be used as an index of paraphilic interest (and perhaps also risk to reoffend) in women who sexually offend (e.g. [9–11]).

Despite an enduring interest in this topic, studies on the assessment of genital response in women who sexually offend remain virtually nonexistent. There is only one published case study using a genital measure to assess paraphilic interests in a woman who sexually offended against children [12]. This lack of research is likely caused by the fact that the majority of sexual offenders are men. A meta-analytical review of 17 samples across 12 countries showed that 2% of sexual

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offences reported to police are committed by women, though the prevalence rose to nearly 12% for victimization surveys, highlighting a problem of underreporting [13]. Forensic clinicians could benefit from having access to valid measures of women's sexual interests.

The primary aim of this review is to provide an overview of genital measures of sexual interest that may be relevant to assessing paraphilic interests among women who sexually offend. Because of problems with genital measures, a secondary aim is to review non-genital measures of sexual interests among women who sexually offend. To do so, we will provide an updated and brief review of research on gender/sex differences in sexual response as they relate to the utility of genital and non-genital measures for assessing women's sexual interests. We will discuss future directions for research on the genital and non-genital assessments of sexual interests among women who have committed sexual offences.

Genital Measures of Women's Sexual Arousal

Among the various physiological changes that reflect sympathetic nervous system activation during sexual arousal—including pupil dilation and increased heart and respiration rate—changes in genital blood flow are the most reliable and specific indicator of sexual arousal [14, 15]. Part of the approach to validating a measure of genital response is to establish its discriminant validity, which is indicated by the detection of genital responses to sexual, but not emotionally evocative, nonsexual stimuli (e.g. [16]). Presenting emotionally evocative stimuli devoid of sexual content provides an opportunity to distinguish whether changes in genital response are specific to sexual arousal or denote more diffuse sympathetic nervous system activation associated with emotional responding in general [17].

Kukkonen [18, 19] reviewed 10 measures of women's genital response, organized in three classes: photoplethysmography, thermography, and imaging. Among the 10 measures of women's genital response, six have been shown to specifically assess sexual arousal. The clitoral, labial, and vaginal photoplethysmographs use acrylic probes with a light source and a light detector to measure changes in the transparency of genital tissues using light reflectance [16, 20, 21]. The vaginal photoplethysmograph is the most widely used measure of women's genital response and captures a rapid, relatively automatic genital response, which is conceptualized as a reflexive response to sexual cues [22, 23]. The labial thermistor and thermographic camera assess changes in genital temperature as a proxy for blood flow [24, 25], and the laser Doppler imager measures the number and speed of moving blood vessels below the surface of the skin using the principles of the Doppler effect [26].

Given the availability of several validated measures of women's genital response, the dearth of research on the sexual interests of women who sexually offend is, on the surface, perplexing. It is important to note, however, that a valid measure of genital response, which detects a response specific to sexual arousal, versus diffuse emotional responding, does not necessarily constitute a measure of sexual *interest*. The determination of relative responding to different categories of sexual stimuli is needed to identify and distinguish sexual interests, such that increased genital responses are produced for preferred versus nonpreferred stimulus features. Sexual preferences for gender, age, and sexual activity cues can be assessed, with the latter two categories being relevant to paraphilic interests and sexual offending (e.g. interest in children, interest in sexual violence).

Sexual Interest Testing With Genital Measures

There is a known gender/sex difference in three phenomena related to sexual arousal that are relevant to assessing sexual interests: *category-specificity* (the degree to which genital responses correspond with self-reported sexual orientation; [27•]), *sexual concordance* (the degree of agreement between genital response and self-reported sexual arousal; [28]), and *cue-specificity* (the degree of differentiation in sexual responses to sexual cues; [29]). When considered as a group, men tend to exhibit genital responses that correspond with their sexual orientation to a greater extent than women (see [27•, 30, 31] for reviews). For men, high category-specificity applies to sexual orientation for gender and for age (i.e. chronophilias; [32, 33]). In terms of sexual concordance, men exhibit greater agreement between their genital responses and self-reported sexual arousal than do women, on average (reviewed in [28]).

There is some variability in the category-specificity of women's genital responses, depending on their degree of sexual attractions to women and men. Sexual concordance varies within groups of women as well. Gynephilic women (i.e. sexually attracted to women) exhibit greater genital responses to female versus male cues, thus exhibiting some category-specificity, whereas androphilic women (i.e. sexually attracted to men) show largely undifferentiated responses to male and female cues (e.g. [34]). Similarly, sexual concordance appears to vary by degree of sexual attraction, with gynephilic women exhibiting a greater degree of sexual concordance than androphilic women [35]. Although the relatively low category-specificity of androphilic women's genital response was first shown using the vaginal photoplethysmograph, findings were replicated for androphilic women using other measures of genital blood flow, including the clitoral photoplethysmograph [36] and the thermographic camera [37]. Conversely, sexual concordance has been shown to vary by the way in which genital response is assessed. Namely,

agreement between genital response and self-reported sexual arousal is greater for measures that assess blood flow in the tissues of the vulva versus the vaginal walls [28, 37, 38]. Nevertheless, when considered as a group, women with typical sexual interests tend to exhibit low cue-specificity, low category-specificity, and low sexual concordance (reviewed in [39]), which poses a problem for the assessment of sexual interests because patterns of genital response do not reliably reflect self-reported sexual orientation or self-reported sexual arousal.

Unlike for gender cues, women's genital responses for age cues have only been examined in one case study of a woman with multiple paraphilic interests, including pedophilic interests, who sexually molested several girls and boys [12]. Using the vaginal photoplethysmograph as a measure of genital response, the woman exhibited low cue-specificity for gender cues, age cues (i.e. undifferentiated response to adult and child sexual stimuli), and sexual activity cues (i.e. undifferentiated response to consensual and nonconsensual sex). This case study thus suggests that women's low cue-specificity for gender cues may also span other domains of sexual interest that are more relevant to paraphilic interests, including age and sexual activity cues.

With respect to sexual activity cues, only one study has been conducted with women who have paraphilic interests. Two groups of women with either masochistic or typical sexual interests listened to narratives describing masochistic or conventional sex while their genital responses were measured using the vaginal photoplethysmograph [40]. The genital responses of women with masochistic sexual interests exhibited low sexual activity cue-specificity (i.e. undifferentiated genital response to masochistic and conventional sex). The low cue-specificity of genital response for women with paraphilic interests is consistent with results from the case study mentioned above [12].

Women with typical sexual interests have repeatedly exhibited undifferentiated genital responses to stimuli featuring sexual violence (e.g. nonconsent, threats) versus conventional sex [16, 20, 23, 41, 42]. Stimuli used in such studies included narratives of a female actor describing her own violent sexual assault by a man, which produced undifferentiated genital responding despite the sexual assault stimuli being rated as unarousing, unpleasant, and anxiety-provoking and the consensual sexual stimuli being described as arousing and pleasant (e.g. [23, 42]). In two studies, women with typical sexual interests have exhibited high cue-specificity for conventional sex versus masochistic sex [40] or nonconsensual sex [43]. However, taken together, the body of research does not support the use of the most commonly used measures of genital response to detect paraphilic or even typical sexual interests.

The tendency for women to exhibit largely undifferentiated genital responses to sexual cues led to the development of the *preparation hypothesis* [23]. The hypothesis posits that women's rapid, reflexive, and undifferentiated genital response functions to prepare the genital tissue for sexual activity through the production of vaginal lubrication, thereby preventing injury to the reproductive tract [16, 22, 30, 44]. According to the preparation hypothesis, genital responses do not necessarily indicate sexual interest. An evaluation of over 10 years of research suggests that there is considerable support for the preparation hypothesis (see [39]); however, a new measure of genital lubrication exhibits high cue-specificity, which is inconsistent with the preparation hypothesis.

The litmus test strip is a measure of genital lubrication at the vaginal opening, recorded as millimetres of colour change on litmus paper [45]. To assess the cue-specificity of genital lubrication, women viewed a series of sexual stimuli that varied by gender and sexual activity cues while their genital responses were measured using the vaginal photoplethysmograph and the litmus test strip [46••]. Women produced greater genital lubrication in response to a preferred sexual stimulus relative to all other sexual stimuli, thus exhibiting high cue-specificity for sexual activity. This effect was observed despite the vaginal photoplethysmograph showing similar responses across all sexual stimuli, indicative of low cue-specificity for gender and sexual activity assessed using this measure.

In two studies employing the litmus test strip, genital lubrication and vaginal blood flow assessed by the vaginal photoplethysmograph were not significantly correlated [45, 46••]. Given that the vaginal photoplethysmograph is the most widely used measure of women's genital response and that genital lubrication is purported to arise from increased genital blood flow [47, 48], the nearly absent correlation between measures was unexpected. However, genital lubrication assessed by the litmus test strip was correlated with genital blood flow assessed by the laser Doppler imager in one study [49]. The relationship between genital lubrication and blood flow assessed by the laser Doppler imager is promising because the two types of response are theoretically related. Across three studies, the litmus test strip exhibited remarkably consistent lengths of colour change for nonsexual stimuli, which may reflect basal lubrication in control samples of premenopausal women and could be used as a standard of comparison in clinical and forensic research [45, 46••, 49].

In sum, the commonly used genital measures are unlikely to become the measure of choice for assessment of paraphilic interests among women who sexually offend. The litmus test strip shows some promise as a measure of sexual interest, but much validation work is required before using this measure in clinical contexts.

Sexual Interest Testing With Non-genital Measures

As an alternative to the use of self-report or genital measures, several non-genital measures have been developed and

applied to the assessment of paraphilic interests among men who sexually offend (reviewed in [50, 51]). Non-genital measures of sexual interest may assess some aspect of response latency to sexual cues (e.g. viewing time, reaction time) or visual interest assessed via eyetracking (e.g. pupil dilation, visual fixation) [52]. Among the non-genital measures of sexual interest, viewing time and the Implicit Association Test (IAT) have undergone the most empirical investigation [50]. When applied to the study of pedophilic interests, meta-analytic findings suggest that viewing time—the time an individual spends viewing a stimulus while performing a task (e.g. rating sexual attraction to a stimulus)—discriminates between men with and without sexual interest in children [53]. A meta-analysis of studies using the IAT—a measure that assesses the strength of automatic associations between target concepts (e.g. adult vs. child) and a particular attribute (e.g. sex) by comparing reaction times—shows that men with pedophilic interests associate child and sex, whereas men who are sexually attracted to adults do not [54].

Non-genital measures of sexual interest may be favoured in clinical or forensic contexts because they are less invasive than genital response measures. However, non-genital measures are not entirely specific to sexual response [15] and some may be susceptible to conscious manipulation of responses (e.g. [55, 56]), posing problems for forensic applications; the same can be said of penile responses, however (e.g. [57]). Still, there appears to be growing interest in the use of non-genital measures to assess for paraphilic interests among men who sexually offend. The parallel body of research on non-genital measures of paraphilic interests among women who sexually offend is lacking, however. Nevertheless, non-genital responses to gender cues, and age cues to a lesser extent, have been assessed in women with typical sexual interests.

Consistent with responses on genital measures of sexual arousal, androphilic women tend to exhibit low category- and cue-specificity in their responses. In viewing time tasks, androphilic women, and gynephilic women to a lesser extent, exhibit lower cue-specificity than men for gender cues, but not age cues (e.g. [58–62]). The same pattern of results is observed when pupil dilation is used as a measure of sexual interest, such that androphilic women exhibit undifferentiated responding for gender cues, but not age cues ([63••, 64–66]; cf. [67]). Using the IAT, androphilic women exhibit low category-specificity in their automatic responses to sexual stimuli, whereas gynephilic women exhibit high category-specificity, such that their automatic appraisals are consistent with their self-reported sexual preferences [68]. The high cue-specificity of women's response for age cues suggests that viewing time and pupillometry may have some promise in the context of assessing women's sexual interests toward children. The introduction of a viewing time measure that utilizes film clips expands the capability of assessing cue-specificity for sexual activity cues that are not easily captured in still images [69].

Attentional processing of preferred versus nonpreferred sexual cues can also be investigated using eyetracking. The time to first fixation is deemed a measure of *initial* visual attention (i.e. attentional capture) and the duration of fixation is a measure of *controlled* visual attention (i.e. sustained attention; [70•]). In a forced attention paradigm (i.e. two images are presented simultaneously and compete for attention), men with pedophilic interests show faster first fixations to child images than to adult images; however, they also show greater relative fixation times for adult images, suggestive of conscious manipulation [55, 56]. The same type of forced attention paradigm shows some promise for detecting cue-specific responses to gender and age cues in women with typical sexual interests. Gynephilic and androphilic women (and men) exhibit high cue-specificity for gender and age cues at the controlled attention stage of visual attention; however, androphilic women exhibit low gender cue-specificity for initial attention [70•, 71–73, 74••]. Consistent with viewing time and pupillometry, androphilic and gynephilic women exhibit high cue-specificity for age cues across indices of initial and controlled attention [74••]. The pattern of response for controlled visual attention represents one of the only instances of high gender cue-specificity in women. Since the duration of fixation is under conscious control, this response may be vulnerable to manipulation in the context of forensic assessment.

In sum, non-genital measures show promise in the evaluation of paraphilic interests among women who sexually offend, but again, much validation work remains to be done.

Implications for Research and Clinical Practice

Despite promising results in the assessment of typical sexual interests in women in the research domain, the application to clinical and forensic practice is not ready yet. Among the challenges to conducting research on women who sexually offend are the low base rates of both paraphilic interests and sexual offences among women (e.g. [13, 75, 76]), and a reluctance on the part of society to acknowledge sexual offending behaviour in women for what it is, and to link this behaviour to paraphilic interests [77]. An additional barrier may stem from beliefs that no genital or non-genital measure can be useful for assessing women's sexual interests because, to date, women's genital responses tend to not correspond closely with their self-reported sexual arousal or sexual orientation.

Women's undifferentiated genital response, particularly for androphilic women and for gender cues, does not conclusively demonstrate that these measures are useless for sexual interest testing among women who sexually offend. Prior to drawing such a conclusion, more research is needed to investigate the relative response patterns of women with paraphilic interests, as

has been done for men. Furthermore, the assessment of genital responses to age and sexual activity cues, rather than relative responding to gender cues only, is needed. Several non-genital measures show that women with typical sexual interests exhibit high cue-specificity for age cues (i.e. viewing time, pupil dilation, visual fixation; [59, 60, 63••, 74••]), which would be relevant for research on women with chronophilias (i.e. paraphilias related to different maturity categories; [32, 33]).

Although men exhibit high cue-specificity for gender, age, and sexual activity, these sexual interest domains may not be related. For women with typical sexual interests, there is empirical evidence that gender and age preferences operate independently. That is, women concurrently exhibit low cue-specificity for gender cues and high cue-specificity for age cues (e.g. [60, 63••]; cf. [12]). The variability in degree of cue-specificity of women's sexual response across gender orientations (i.e. androphilia, gynephilia) and sexual cues (i.e. gender, age) needs to be better understood before genital response can reliably be used as an index of sexual interest, or discounted as such.

The need for continued investigation of sexual preference testing in women is highlighted by new developments with the litmus test strip [45]. Given the high cue-specificity of genital lubrication for sexual activity cues, the litmus test strip may be a useful measure for assessing sexual interests in women. Results from Sawatsky et al. [46] must be replicated for women with typical sexual interests and extended to women with paraphilic interests. The assessment of genital lubrication following exposure to narratives describing sexual violence (e.g. nonconsent, threats) would aid in further assessing sexual activity cue-specificity. Among the benefits of using the litmus test strip as a measure of genital response in clinical and forensic research are its low cost and ease of use, relative to measures of genital blood flow. In terms of non-genital measures, controlled attention assessed by eyetracking shows promise as a measure of sexual interest for gender and age cues [70•, 71–73, 74••]. Given that the controlled attention stage is thought to be under conscious control, results from initial studies must be extended to women with paraphilic interests whose responses might be vulnerable to reporting biases.

Given the variability in response patterns in women and the lack of research on women with paraphilic interests, we do not recommend the use of genital or non-genital measures as indices of sexual interest for women in psycholegal contexts at this time. Even with further research, the utility of the vaginal photoplethysmograph for sexual interest testing appears tenuous at best, because it captures a reflexive aspect of genital response with low cue-specificity for gender and sexual activity cues (cf. [9]).

Several factors ought to be investigated prior to the application of sexual interest testing for women who sexually offend, not the least of which is the suitability of such measures to *individual* assessment in clinical or forensic contexts. In their review, Suschinsky and Lalumière [11] cautioned against the extension of sexual interest testing used to assess men who sexually offend due to women's undifferentiated responding, which would appear "deviant" compared with men's category- and cue-specific responses. Research over the past 10 years has revealed substantial heterogeneity in women's sexual response across multiple constructs (e.g. category-specificity, sexual concordance). In the case of highly variable responses within a group, undifferentiated group-level responding may be the product of the tradition of reporting average responses (see [39] for review). An important step in the development of genital and non-genital measures for use in clinical and forensic contexts will be to examine group *and* individual responses to sexual cues to develop a better understanding of women's sexual response.

Conclusions

A substantial body of research supports the assessment of genital response as a valid measure of sexual arousal among women with typical sexual interests [18, 19], but not as a measure of paraphilic interests. Studies on the genital response of women with paraphilic interests, or those who have engaged in sexual abuse, remain virtually nonexistent. The dearth of research on women with paraphilic interests is also reflected in non-genital measures of sexual response. Although some assessment methods show promise, more research is needed before genital or non-genital measures can be used for assessments of women suspected to have paraphilic interests in clinical and forensic settings.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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