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# Changes in Sexual Arousal as Measured by Penile Plethysmography in Men with Pedophilic Sexual Interest

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## ABSTRACT

**Introduction.** Although pedophilia is defined by a recurrent sexual interest in prepubescent children, little attention has been paid to the stability or fluidity of this sexual interest over time.

**Aim.** The aim of the current study was to investigate if patterns of penile tumescence (as a proxy for sexual interest) measured by penile plethysmography testing (PPT) can change.

**Methods.** In this retrospective chart review study, PPT results of 43 men diagnosed with pedophilia were collected and analyzed. All participants displayed a pedophilic sexual arousal pattern at the time of their first PPT. To test for change, we compared initial PPT results with subsequent PPT results measured at least 6 months later.

**Main Outcome Measure.** Sexual arousal was assessed using PPT by measuring change in penile circumference induced by the presentation of standardized sexual audio stimuli.

**Results.** Approximately half of the sample (n = 21) displayed a change in PPT results. This change was characterized by a significant decrease of sexual arousal in response to pedophilic (child) stimuli and a significant increase of sexual arousal in response to nonpedophilic (adult) stimuli. No differences between sexual interest changers (ICs) and nonchangers (NC) were found for demographic data or for length of time between assessments. However, between-group comparisons revealed that ICs had significantly lower pedophilic indices at the initial assessment than NCs.

**Conclusions.** Results from the current study indicate that relative pedophilic interest, as defined by increase in penile circumference in response to nonpedophilic stimuli as measured by PPT, changed in about 50% of men diagnosed with pedophilia who also had initial pedophilic PPT sexual responses. This represents a significant challenge to the hypothesis that sexual interest in men with pedophilia is unchangeable and should be the focus of future studies. Müller K, Curry S, Ranger R, Briken P, Bradford J, and Fedoroff JP. Changes in sexual arousal as measured by penile plethysmography in men with pedophilic sexual interest. *J Sex Med* \*\*;\*\*\*\_\*\*\_\*\*.

**Key Words.** Pedophilia; Change in Sexual Interest; Stability of Sexual Interest; Sexual Arousal; Penile Plethysmography; Prepubescent Children

## Introduction

Pedophilia is a psychiatric disorder defined by persistent, intense sexually arousing fantasies,

**Note:** This study is based on work done by Karolina Müller in partial fulfillment of her master's degree under the supervision of Drs. Peer Briken and John Paul Fedoroff.

sexual urges, or behaviors involving sexual activity with a prepubescent child or children (Diagnostic and Statistical Manual of Mental Disorders [DSM], versions II–5 and International Classification of Diseases [ICD], version 10) [1–6]. The term “pedophilia” was first introduced diagnostically, in the DSM II [1], under the category of “sexual deviations.” Years later, the DSM III [2]

expanded the categorization to include specifications, including experiencing sexual urges and/or fantasies for prepubescent children (13 years or younger); the individual must have either acted on these urges or be distressed by them, and the object of the attraction must be at least 5 years younger than the individual who must be over 16 years of age. Further to this, the criteria excludes late adolescents with ongoing sexual relationships with 12- to 13-year-olds. Lastly, it encourages specifying the gender(s) of the children to whom the person is sexually attracted, whether the attraction is limited to incest and whether it is exclusive (attraction only to children) or nonexclusive (attraction to both children and adults). The only difference to the criterion for the DSM IV [3] entry for pedophilia was the addition of the qualifier that the sexual fantasies, urges, and behaviors must have been present for at least 6 months. The DSM IV-TR [4] did not provide any updates to the criterion for pedophilia. Despite ongoing debate over the diagnostic criteria for pedophilia, the current DSM 5 [5] retained the same original criteria as listed in the DSM IV-TR. The most important update, which was made to all the paraphilias, categorized them as “disorders.” Pedophilia is the only DSM 5 paraphilic disorder in which there is no provision for coding an “in remission” criterion.

It is often claimed that pedophilia is a “lifelong condition” based on the hypothesis that sexual interest cannot be changed. This claim is typically based on studies of men convicted of sexually assaulting children, especially men who have sexually reoffended. This is problematic as prison populations are more likely to include repeat offenders who have demonstrated a pattern of failure to change. In addition, not all men who commit sex crimes have a pedophilic disorder. It has been argued that pedophilia must be “incurable” since given the social stigma and legal consequences; men with pedophilia would change if they could. However, the fact that people do not change in spite of adverse consequences is not in itself proof they cannot change. Some theorists have used the failed and misguided attempts to change sexual orientation (e.g., faradic conditioning and so-called reparative therapy of gay men) to support the argument that pedophilic sexual interest is immutable [7–9]. However, sexual orientation is different from sexual interest. Advocates for the idea that pedophilic sexual interest is fixed also pointed out that while anti-androgen pharmacologic interventions decrease pedophilic

reoffense rates, they do so by suppressing all sex interest.

The self-reported sexual interests of men with pedophilia who claim their interests have changed are often viewed with skepticism because of their presumed tendencies to deny or diminish their pedophilic sexual interests [10]. The measurement of sexual interest by men in prepubescent children has been attempted by using various techniques [11–15]. In many countries, penile plethysmography testing (PPT) is one of the main physiological measures of sexual arousal in men. PPT has been criticized [16] but is still considered the “gold standard” for objective measurement of sexual interest in men. PPT is based on the observation that sexual arousal in men is associated with penile tumescence. Therefore, we operationalized sexual interest as penile tumescence in response to auditory stimuli as measured by PPT. For example, men who demonstrate a sexual response to audiotaped sexual scenarios involving sexual relations between two men typically continue to show the same response pattern over time. In some cases, the response decreases for one of four reasons: (i) the man is attempting to suppress his response to gay stimuli and has learned how to suppress his erection by, for example, distracting himself by doing mathematical puzzles in his head during the test; (ii) he has become simply bored (less aroused) on hearing the same stimuli a second time; (iii) he is taking a medication that suppresses his sex drive; and (iv) his physiology has changed because of recent sexual activity, illness, or age. Although it is common for penile response to decrease on repeat testing, it is rare for a man with a primary sexual arousal pattern in response to male stimuli to change by showing a new increased sexual arousal pattern in response to female stimuli.

The theory that pedophilia is a lifelong condition presents a testable hypothesis, namely that men with a primary PPT response pattern demonstrating penile tumescence in response to pedophilic (child) stimuli should not demonstrate increased penile tumescence in response to nonpedophilic (adult) stimuli on follow-up PPT. Alternatively, if pedophilic interest is changeable, it should be possible to show that men with pedophilia can not only show a decrease in penile response to pedophilic (child) stimuli but also show an increase in penile response to nonpedophilic (adult) stimuli.

In order to test these two competing hypotheses, we selected men diagnosed with pedophilia

who also demonstrated a greater increase in penile circumference when listening to audiotapes involving children. Although we do not know how exclusive the pedophilic interests were of the men in the study sample, the fact that the men with pedophilia also showed significantly more penile tumescence in response to child stimuli indicates greater sexual response to children during initial testing.

### Methods

This study is based on a chart review of phallometric test data from the Sexual Behaviours Clinic (SBC) at the Royal. It was conducted as part of the requirements for a master's thesis (K.M.) under the supervision of two of the co-authors of this article (P.B. and P.F.). It was ethically approved by the Institutional Research Ethics Board of the Royal Ottawa Health Care Group.

### Subjects

This retrospective study relies on a sample of convenience consisting of all men who were assessed and treated in the SBC between 1983 and 2011 who met the following inclusion and exclusion criteria: voluntarily participated in standard SBC PPT during initial assessment and again at least 6 months later and who produced interpretable PPT results (cutoff score of 3-mm circumference increase at each testing in response to at least one stimulus category). In addition to a formal diagnosis of pedophilia (according to the DSM III, IV, or IV-TR criteria), all men displayed a pedophilic sexual arousal pattern at the time of first PPT.

The charts were retrieved for a total of 43 participants meeting the predetermined study criteria listed in the preceding paragraph. The mean age of the study participants at initial PPT was 34 years (standard deviation [SD] = 11.42, ranging from 18 to 62 years). The mean school grade passed was 11 years (SD = 4.08), but 51% did not graduate from high school. Fifty-six percent were single at the time of first PPT, 33% were married or in a common law relationship, and 11% were separated or divorced. Fifty-one percent were referred to the SBC through some involvement in the Criminal Justice System, 44% were referred through a physician or were self-referred, and 5% had missing data concerning referral source.

All men in this study had been diagnosed with pedophilia according to DSM III, DSM IV, or DSM IV-TR criteria by a psychiatrist working in the SBC. Although 63% of the sample admitted their sexual interest in children at the time of their

first PPT, 12% denied a sexual interest in children, and for 25%, no information was available concerning their self-reported primary sexual interests. Besides a diagnosis of pedophilia, five men also had an additional paraphilic disorder (fetishism, exhibitionism, and/or sexual sadism), and 22 men were diagnosed with one to five concurrent nonparaphilic disorders (mood disorders, anxiety disorders, personality disorders, and/or drug abuse or dependence).

Most of the study sample had been charged or convicted at least once for a sexual offense against a child (79%). Of the 34 men who had been charged or convicted, 29% denied committing a sexual offense against a child at the time of their initial PPT. One subject had no officially reported victim, 44% had one victim, 21% had two victims, 26% had three or more victims, and for two subjects, no information was available. The proportion of men with only female victims was 55%, 32% of the men had only male victims, and 13% of the men had both female and male victims.

### Materials

Data concerning demographic and clinical information were collected through chart review. Change in penile circumference in response to standardized auditory sexual stimuli was measured as a proxy for change in sexual arousal. The SBC has used the same standardized set of sexual stimuli for the last 30 years. In an unpublished independent study [17] involving 100 admitted child molesters and 100 control subjects, good discriminant validity of PPT was scored (area under the curve = 824, standard error [SE] = 0.03,  $P < 0.001$ ; sensitivity = 77.8%; specificity = 76.3%).

Nine auditory stimuli (each approximately 3 minutes long) presenting consensual sexual activity between adults as well as pedophilic sexual activity involving an adult man and a child were used to compare sexual arousal patterns in response to pedophilic and nonpedophilic auditory stimuli. The audiotaped sexual scenarios were recorded in a male monotone voice. The test package, always involving an adult man, included the following sexual scenarios: the child initiates a sexual encounter, and the child appears to willingly participate equally in the initiation of a sexual encounter; a related child agrees to a sexual encounter as well as a mutually consenting sexual interaction between an adult female and an adult male, as well as sexual interaction between two adult males. These test stimuli have been used in previously published studies [18–20].

## Procedure

PPT is currently the “gold standard” for the objective measurement of sexual arousal, based on the association between penile tumescence and subjective sexual arousal [21] (for a detailed description, see Firestone et al. [22] and <http://www.limestonetech.com>). During PPT measurement of sexual arousal, the man is seated alone in a testing room with an elastic band-type sensor (Indium-Gallium strain gauge, Limestone Technologies Inc., Odessa, ON, Canada) behind the head of his penis while a standardized set of sexual stimuli is presented via an Epson PowerLite 50c. PREFTEST Professional Suite (Limestone Technologies) software is used to present stimuli and to monitor conductance changes of the strain gauge manufactured by Farrall Instruments (Limestone Technologies Inc.). PrefTest DataPac (Limestone Technologies Inc.) uses a 16-bit Sigma Delta technology to acquire precision accuracy for the physiological measurements. It is connected to a computer via an RS232 interface. Data are fed into an IBM compatible computer (i.e., Dell notebook [Dell Canada Inc., North York, ON, Canada] supported by Windows2000 system; Microsoft, Redmond, WA, USA) for printout and storage. Pretesting calibrations of the strain gauge ensure that sexual arousal recordings are a linear function of change in penile circumference. Increases in penile circumference after presentation of a stimulus, compared with baseline circumference, are assumed to reflect the degree of sexual arousal that the stimulus elicits. To ensure that the participant returns to baseline arousal before each auditory scenario is started, individually variable detumescence periods are used.

Following an established methodical procedure, raw scores of individuals showing interpretable PPT results were first transformed into  $z$  scores to eliminate differences in response between participants as well as between assessments [23]. Next, pedophilia indices (PIs) were computed for each assessment time point by subtracting the greatest response to any adult stimuli from the greatest response to any child stimuli to assess the relative sexual preference and changes in arousal patterns [24,25]. Indices above 0.25 indicate that a person has a relatively greater increase in penile circumference in response to pedophilic (child) stimuli. Indices between 0.25 and  $-0.25$  indicate equal arousal in response to pedophilic (child) and nonpedophilic (adult) stimuli, and indices below  $-0.25$  indicate relatively greater penile arousal in

response to nonpedophilic (adult) stimuli. Participants who demonstrated a change in phallogometrically measured sexual arousal patterns (initial  $PI \geq 0.25$ , subsequent  $PI < -0.25$ ) were assigned to the “interest changer” (IC) group, and participants who did not display a change in sexual arousal patterns (initial and subsequent  $PI \geq 0.25$ ) were assigned to the interest “nonchanger” (NC) group.

Besides examining the stability and flexibility of objectively measured sexual arousal patterns, NCs and ICs of sexual arousal pattern were compared on demographic and PPT information to determine whether there were differences between the two study groups. Two-tailed tests of significance were used, and Bonferroni–Holm corrections were conducted to decrease the type I error rate.

## Results

At the time of the second PPT (mean 49.88 months later,  $SD = 49.45$ , ranging from 6 to 259 months), 22 participants still displayed a positive (pedophilic) PI, but 21 participants changed to show a greater relative arousal to nonpedophilic (adult) stimuli (negative  $PI \leq -0.25$ ). Between-group comparisons using  $t$ -tests and  $u$ -tests for independent samples showed that the IC group and the NC groups did not significantly differ in age, years of education, number of victims, and the length of time between the assessments (Table 1). No differences were found between interest change and the type of referral; history of ever being convicted or currently charged for a sexual offense against a child; the gender of the victim(s); denial of sexual offenses against children; and denial of sexual interest in children (Table 2). Nonetheless, a marginally significant trend was suggested: subjects denying a sexual offense against a child were more likely to show a normalization of sexual arousal pattern ( $P = 0.070$ ).

$t$ -Tests for paired samples showed that the mean magnitude of the PIs at both assessment time points were not significantly different in the NC group but were significantly different for the IC group ( $P < 0.001$  and  $< P_{\text{adjusted}}$ ) (Table 3, Figure 1). The difference between the initial and subsequent pedophilic indices of the ICs had a large effect size of  $d = 5.3$ . A detailed look at the different stimulus categories indicated that the 21 participants who changed their relative sexual interest displayed both a significant decrease in sexual arousal toward pedophilic (child) stimuli ( $P < 0.001$  and  $< P_{\text{adjusted}}$ ) and a significant increase in sexual arousal toward adult stimuli ( $P < 0.001$  and  $< P_{\text{adjusted}}$ ) from the

**Table 1** Between-group comparisons of IC and NC group via *t*- and *u*-tests for independent samples

Variables	IC group (n = 21)		NC group (n = 22)		Significance (two-tailed)
	Mean	SD	Mean	SD	
Sociodemographic data					
Age (years)	35.81	12.32	31.91	10.42	0.268
Education (years)	11.05	4.36	11.18	3.88	0.916
	Mean rank	Sum of rank	Mean rank	Sum of rank	
Offense-related data					
Number of victims	24.95	549	18.90	397	0.107
Phallometric data					
Time between assessments (months)	18.67	392	25.18	554	0.089
	Mean	SD	Mean	SD	
Initial pedophilic index (z scores)	1.48	0.74	1.99	0.73	0.029**
Subsequent pedophilic index (z scores)	-1.70	0.71	2.05	0.74	0.001***

\*\* $P < 0.05$ ; \*\*\* $P < 0.001$

No differences in age, years of education, number of victims, and mean time between phallometric assessments exist between the two groups. ICs had significant lower pedophilic indices at the initial (\*\* $P < 0.05$ ) and subsequent (\*\*\* $P < 0.001$ ) phallometric assessments than NCs  
IC = interest changer; NC = interest nonchanger; SD = standard deviation

initial to second PPT (Table 3, Figure 2). The differences in sexual arousal for child and adult stimuli had large effect sizes of  $d = 2.2$  and  $d = -3.9$ . In contrast, NCs did not display differences in sexual arousal for child or adult stimuli across tests (Table 3, Figure 3).

However, between-group comparisons using *t*-tests for independent samples showed that ICs had on average significantly lower pedophilic indices at the initial ( $P < 0.05$  and  $< P_{\text{adjusted}}$ ) and subsequent phallometric assessment ( $P < 0.001$

and  $< P_{\text{adjusted}}$ ) than NCs (Table 1, Figure 1). The difference at the initial assessment had a modest effect size of  $d = 0.59$ , but at the subsequent assessment, it had a large effect size of  $d = 4.41$ . This result indicates that measured change in the IC group was mainly because of an increase in nonparaphilic interest.

## Discussion

Studies of men with pedophilic disorder usually include individuals who came into conflict with the legal system. In this study, however, data were drawn from a sample of men clinically diagnosed with pedophilia regardless of whether or not they had ever been charged with a sex offense. Pedophilia is characterized as a lifelong disorder with persistent sexual interest in prepubescent children. We operationalized sexual interest as sexual arousal toward child and adult stimuli measured by PPT. We used PPT as an objective method to measure the sexual arousal pattern of men with diagnosed pedophilia at two different time points at least 6 months apart to test the hypothesis that pedophilic interest is changeable. We retrospectively examined the stability and flexibility of sexual arousal pattern of 43 men and showed that approximately half of the sample displayed a significant change in PPT results. This change was characterized by a significant increase of sexual arousal toward adult stimuli and a significant decrease in response to child stimuli.

It is possible that the demonstrated changes in sexual arousal pattern could be explained by the men temporarily suppressing pedophilic sexual arousal and inducing nonpedophilic sexual arousal

**Table 2** Associations to changes in sexual arousal pattern via chi-squared tests

Variables	Sexual arousal pattern change		Significance (two-tailed)
	Yes	No	
	n	n	
Sexual offense against a child (n = 41) <sup>†</sup>			
Yes	18	16	1.000
No	3	3	
Denial of sexual offense against a child (n = 33) <sup>†</sup>			
Yes	8	2	0.070
No	10	13	
Gender of victim(s) (n = 31) <sup>†</sup>			
Male	6	4	0.490
Female	8	9	
Male and female	1	3	
Denial of sexual interest in children (n = 32) <sup>†</sup>			
Yes	1	4	0.625
No	12	15	

No associations between sexual arousal pattern change and ever being convicted or charged for a sexual offense against a child, denial of sexual offenses against children, gender of the victim(s), and denial of sexual interest in children were found. Fisher's exact test was used if cells had an expected frequency under five

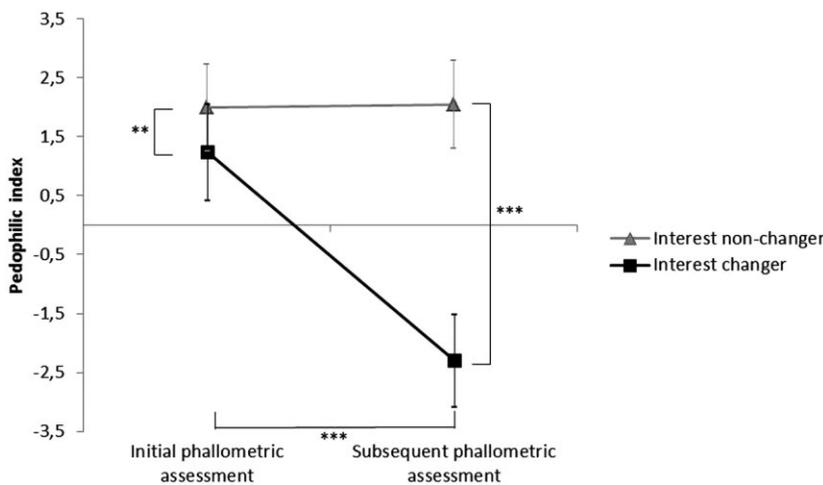
<sup>†</sup>The sample size changed because of missing information

**Table 3** Within-group comparisons of sexual arousal pattern via *t*-tests for paired samples

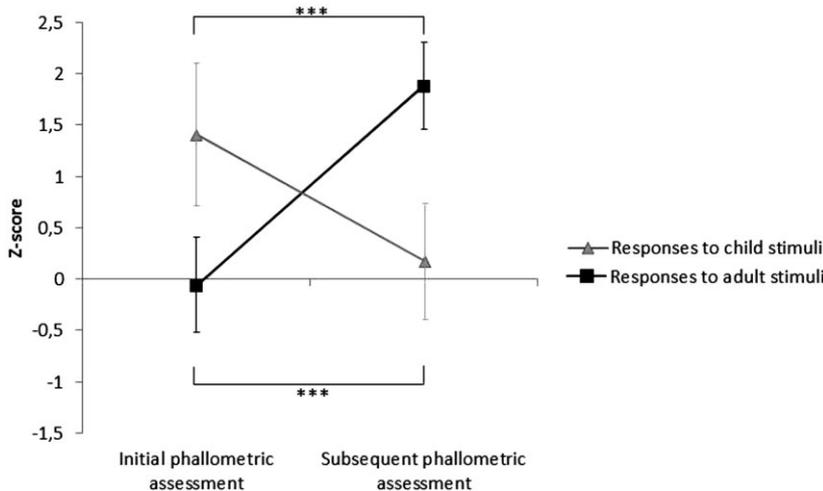
Group	Initial phallometric assessment		Subsequent phallometric assessment		Sig. (2-tailed)
	Mean	SD	Mean	SD	
IC (n = 21)					
Pedophilic index (z scores)	1.48	0.74	-1.70	0.71	0.001***
Peripheral sexual arousal towards child stimuli (z scores)	1.41	0.69	0.18	0.55	0.001***
Peripheral sexual arousal towards adult stimuli (z scores)	-0.07	0.58	1.88	0.42	0.001***
NC (n = 22)					
Pedophilic index (z scores)	1.99	0.73	2.04	0.74	0.790
Peripheral sexual arousal towards child stimuli (z scores)	1.58	0.59	1.74	0.51	0.249
Peripheral sexual arousal towards adult stimuli (z scores)	-0.41	0.88	-0.31	0.81	0.653

\*\*\**P* < 0.001

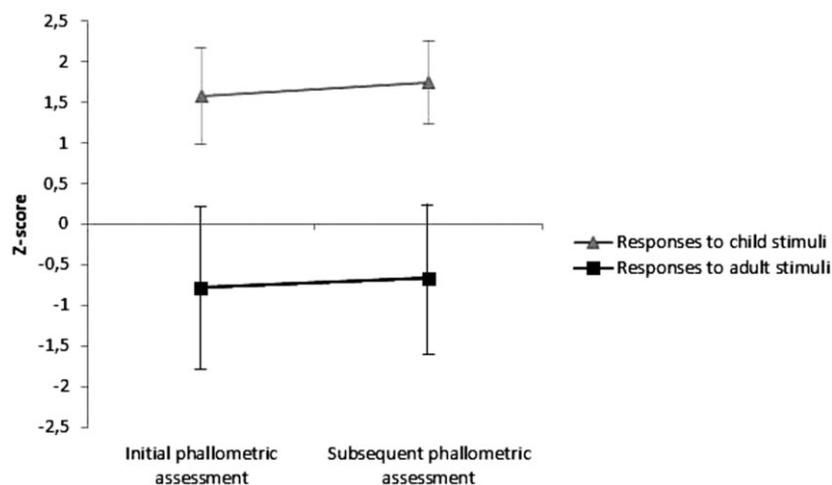
NCs did not show differences in mean magnitude of pedophilic indices as well as sexual responses towards child and adult stimuli between both assessments. ICs displayed significantly lower pedophilic indices (\*\*\**P* < 0.001) as well as significantly decreased sexual responses to child stimuli (\*\*\**P* < 0.001) and significantly increased sexual responses to adult stimuli (\*\*\**P* < 0.001) at the subsequent phallometric assessment than initially  
IC = interest changer; NC = interest nonchangers; SD = standard deviation



**Figure 1** Initial and subsequent pedophilic indices of interest changers (ICs; n = 21) and interest nonchangers (NCs; n = 22). Within-group comparisons of the mean magnitude of the pedophilic indices showed significant differences in initial and subsequent pedophilic indices in IC (\*\*\**P* < 0.001) but not within the NC. Between-group comparisons of the mean magnitude of pedophilic indices showed that the IC had significant lower pedophilic indices at the initial (\*\**P* < 0.05) and subsequent (\*\*\**P* < 0.001) phallometric assessments than NC.



**Figure 2** Responses to child and adult stimuli of interest changers (ICs). Within-group comparisons showed that ICs displayed significantly decreased sexual response to child stimuli (\*\*\**P* < 0.001) and significantly increased sexual responses to adult stimuli (\*\*\**P* < 0.001).



**Figure 3** Responses to child and adult stimuli of interest nonchangers (NCs). Within-group comparisons showed that NCs did not display significant changes in sexual responses to child and adult stimuli.

rather than by persistent changes in sexual interest. Men are able to suppress erection to preferred stimuli and induce erection to nonpreferred stimuli by using cognitive strategies like mental imagery [26]. However, it is difficult to do both (suppress pedophilic responses while also enhancing nonpedophilic responses). Moreover, inhibiting sexual arousal is easier than generating sexual arousal [27]. Participants who suppress their sexual arousal are more likely to display low arousal (below the cutoff score of 3-mm circumference change) toward all stimulus categories and thus produce profiles that cannot be interpreted. However, none of the men in the study sample showed this nonresponder profile. Although habituation within and across phallometric measurements was reported in previous studies and although medications can impact sexual arousal, they do not selectively impact the relative responding. Thus, our findings are not likely to be the result of faking of sexual arousal responses, familiarity with the stimuli, or medications interfering with penile tumescence because these would lead to low responses across all stimuli categories [27]. Previous studies have found that in some child molesters, deviant pedophilic indices changed to nondeviant indices [28–30]. However, to date, no known studies have shown a decrease in response to child stimuli together with a simultaneous increase in response to adult stimuli.

In this sample, no differences between ICs and NCs of sexual arousal pattern were found for demographic- and offense-related data. However, there was the suggestion of a trend ( $P = 0.070$ ) for men who initially denied having sexually offended against a child to be more likely to show a change in their sexual arousal pattern (8/10). This may be

because of increased motivation in these eight men to produce a nonpedophilic PPT response pattern, but numbers are too small to be definitive. Although both groups (ICs and NCs) initially displayed a pedophilic sexual arousal pattern, between-group comparisons revealed that ICs had significantly lower pedophilic indices at the initial assessment than NCs. This is consistent with observations that men with more exclusive sexual pedophilic interests are less likely to change compared with men with less exclusively pedophilic sexual interests. However, it also indicates that the changes observed in the current study were primarily because of enhancement of nonpedophilic sexual arousal (as opposed to simple suppression of pedophilic interests).

There are several limitations that should be noted. First, this is a retrospective chart review. Future studies should include other components of sexual interest (e.g., fantasies), which could provide a more detailed picture of the flexibility and stability of an individual's sexual interests, as well the associated effects of treatment that could be related to changes in sexual arousal patterns. However, the fact that the PPT tests were conducted before the current study was conceived means that the PPT testing and results were not systematically influenced by investigator or patient expectations. Second, although PPT is currently the “gold standard” for physiologic measurement of sexual arousal patterns in men in Canada and the United States, it does have limitations. Men can learn to suppress penile tumescence, and penile tumescence can be suppressed by medications, recent sexual activity, age, lack of sleep, alcohol, and illicit drug use. It is also possible for men to enhance sexual arousal (tumescence) by

fantasy or use of phosphodiesterase type 5 inhibitors. Given that the results of this study are based on relative responding to different stimuli and across different testing sessions, it is unlikely that the demonstrated changes in PPT response patterns were solely because of “faking.” Third, this study had a higher nonresponder rate (50%) than some other studies (30%) [31]. This rate is likely because of the intentionally conservative inclusion cutoff score of 3-mm circumference increase. This cutoff score was chosen a priori to ensure a high sensitivity and specificity of PPT. Studies involving other cutoff scores are both possible and planned. Concerns also exist about the efficacy of stimuli modalities in eliciting sexual arousal in men. Different modalities generate different degrees of penile responses. Videotapes and audiotapes elicit the greatest level of sexual arousal in men, so slides were excluded from this study [32]. In addition, legal and moral concerns prohibit the use of videotapes depicting sexual interaction with children. Therefore, as is always the case in SBC studies, pedophilic videotapes were not used. Fourth, this study included only PPT to measure change in pedophilic sexual interest. It is conceivable that the results are partially explainable by error in the PPT test results; however, it is unlikely test-retest error alone could explain the large effect sizes found in this study. Nevertheless, prospective replications of this study are important. Fifth, this was not a treatment study. During the time that the participants in this study were followed in the SBC, they received varying amounts and types of therapy. Future studies are planned to investigate if any specific treatment modalities were associated with changes in sexual interest on PPT.

According to research involving male sex offenders, sexual arousal to pedophilic stimuli as measured by PPT is one of the risk factors most strongly associated with sexual (re)offending against children [33]. If pedophilic interest is changeable not only by suppressing sexual interest in children but also by increasing sexual interest in adults, it will be a major change in treatment prospects for people with pedophilia. The findings of this study also raise the question of what significance should be attached to a change in PPT test results in risk assessment of sex offenders.

## Conclusion

Results from the current study indicate that relative pedophilic interest as defined by increase in penile

circumference as measured by PPT changed in about 50% of the men with diagnosed pedophilia included in this study. Although it is possible that the men in this study altered their responses in order to “trick” the test apparatus, the fact remains that the “ICs” were somehow able to change their PPT responses from pedophilic to nonpedophilic. Further investigations into how men accomplished this change and into how lasting the change is are both worthwhile and planned. However, this finding is an important challenge to the belief that the sexual interests in men with pedophilia cannot change toward sexual interest in adults. If replicated, it raises the question of why the belief in the immutability of sexual interest is so unchangeable. We speculate it may be because of confusion between gender identity, sexual orientation, sexual interest, and sex drive. The current study supports the view that pedophilic interests are changeable and therefore different from sexual orientation which is not only more difficult to change but also not in need of change. It also suggests that treatment of men with pedophilia should include enhancement of nonpedophilic sexual interests. It is important to note that this recommendation is not a recommendation for treatments aimed at changing nonparaphilic sexual orientations.

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*Conflict of Interest:* The authors report no conflicts of interest.

## Statement of Authorship

### Category 1

#### (a) Conception and Design

Karolina Müller; Susan Curry; Rebekah Ranger; John Paul Fedoroff

#### (b) Acquisition of Data

Karolina Müller; Susan Curry; Rebekah Ranger

#### (c) Analysis and Interpretation of Data

Karolina Müller; Susan Curry; Rebekah Ranger; John Bradford; Peer Briken; John Paul Fedoroff

### Category 2

#### (a) Drafting the Article

Karolina Müller

#### (b) Revising It for Intellectual Content

Susan Curry; Rebekah Ranger; John Bradford; Peer Briken; John Paul Fedoroff

## Category 3

## (a) Final Approval of the Completed Article

Karolina Müller; Susan Curry; Rebekah Ranger;  
John Bradford; Peer Briken; John Paul Fedoroff

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