

# Men with paraphilic interests and their desire to interact with a sex robot

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**Abstract.** Sex robots may present an opportunity for a clinical management of individuals with paraphilic interests whose realisation would result in infliction of harm and/or legal consequences. We explored the prevalence of desire for sex robot experience in a control group and two target groups: one with paraphilic interests in minors, the other with interest in non-consent/violence. We expected both target groups to express a greater desire for sex robot experience than the control group, because sex robots would enable them to express paraphilic sexuality within legal limitations. We used data from two samples of male respondents. The control sample consisted of respondents from a representative online Czech sample (N = 806). Target groups of individuals with paraphilic interests consisted of 48 subjects sexually interested in minors and 57 subjects sexually interested in non-consent/violence against adults. Sex robot experience was desired by 18% of respondents in the control group, 37.5% of respondents in the group interested in minors, and 26% of respondents interested in non-consent/violence. This indicates that individuals with paraphilic interest in minors are slightly more open to the idea of sex robot experience. Studies exploring preferred features of sex robots and interest in their use in therapy are needed.

**Keywords:** Sex robots, sex robot experience, paraphilic interest

## 1. INTRODUCTION

Sex robots are no longer just science fiction: recently, their development had accelerated and companies are putting considerable effort in technical, behavioural, and visual innovations (Aoki and Kimura, 2021). Sex robots can be defined as human-like, full-sized, anatomically correct humanoid service robots that use a range of different materials and technologies and whose price range varies widely. What they have in common is being designed for sexual use (Döring and Pöschl, 2018). They can differ in apparent age and appearance (e.g., different eye colour, pubic hair, hair, skin colour, makeup) and have several removable orifices for sexual use. Sex robots differ from their predecessors, passive sex dolls, in applied artificial intelligence, which makes them active and responsive. Synthetic speech and simple motor skills allow them to speak, move, and display a rudimentary personality. Although their range of behaviours is still limited, sex robots are likely to become highly sophisticated in the near future.

Attitudes toward sex robot experience (SRE) in the general population have been explored by several small, nonrepresentative, web-based surveys (Appel et al., 2019; Edirisinghe and Cheok, 2016; Richards et al., 2016; Scheutz and Arnold, 2016; 2017; Szczuka and Krämer, 2016). The mean age of respondents in those studies ranged around 30–35 years. The results varied: for instance, in a US

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sample of male and female respondents (N = 100; 57 male respondents), 70% of male respondents indicated they would use a sex robot (Scheutz and Arnold, 2016), but only 9% of Malaysian respondents of both sexes (N = 32; 16 male respondents) wanted to entertain this idea (Edirisinghe and Cheok, 2016). In a German study focused only on male respondents (N = 263), 40.3% indicated they would buy a sex robot now or within the next five years (Szczuka and Krämer, 2016). This indicates highly varying rates of acceptance of SRE. In the US sample (Scheutz and Arnold, 2016), men were rather accepting of SRE in most areas of use including paraphilic interests (PI), such as unusual sexual practices (e.g., rough sex or sadistic behaviour), but the use of child-like sex robots was strongly rejected by respondents. In a very large Dutch sample (N = 1,162), de Graaf and Allouch (2016) reported that 22% of respondents thought that robotic sexual partners could decrease the incidence of sexual assault and rape. Furthermore, 17% of participants indicated their belief that robotic sexual partners could sexually assist special target groups, for instance people with social or sexual difficulties.

So far, no empirical study investigated the effects of SRE on their user's partnerships as well as emotional and sexual functioning. Some evidence is emerging from studies on sex doll use, but it is fairly limited and cannot be generalised (Döring et al., 2020). A study on sex doll owners found that they report more issues in their sexual functioning when the sexual activity involves a human partner, while sex dolls provide them with sexual gratification and stimulation (Valverde, 2012). Other studies likewise reported that sex dolls seem to have a soothing and healing effect on users, offer a viable alternative to having a human partner (Knafo, 2015; Knafo and Bosco, 2017), and can alleviate loneliness (Ciambrone et al., 2017).

There is currently a high clinical demand for evidence-based guidelines regarding interactions with sex robots because it is an issue with implications for the physical, mental, and social wellbeing of their users (Cox-George and Bewley, 2018).

## **2. THE USE OF SEX ROBOTS IN PREVENTION OF SEXUAL OFFENDING AND CLINICAL MANAGEMENT OF PARAPHILIC DISORDERS**

Within the context of sex robot use, two issues tend to attract the greatest controversy: the use of sex robots to prevent actual sexual crimes – such as violent assault, rape, or sexual abuse of children – and their potential use in clinical management of paraphilias.

Disorders of sexual preference (paraphilic disorders) are defined in the International Classification of Diseases, 11<sup>th</sup> revision (World Health Organization, 2018) as 'persistent, intense patterns of atypical sexual arousal, manifested by sexual thoughts, fantasies, urges, or behaviours, the focus of which involves others whose age or status renders them unwilling or unable to consent and on which the person has acted or by which he or she is markedly distressed'. The presence of paraphilic interest (PI) itself has no moral or legal implications, but acting upon it in a way that includes another person presents a potential risk to public safety.

Individuals with PI in minors who deliberately suppress their sexual urges report that their primary motivation for abstaining from offending behaviour is the awareness of harm it would inflict upon a child as well as potential legal consequences for themselves (Walker, 2017). Identified strategies to manage paraphilic urges include the viewing of images and videos of children depicted in mainstream media or computer-generated images of children popularised by the Japanese culture (Walker, 2017), maintenance of sexual contacts with adults, and adult pornography or fantasising during masturbation (Houtepen et al., 2016). Child-like sex robot (or child-like sex dolls, e.g., a model by Trottla) could

be viewed as a legal surrogate of their desired partner which has not only a child-typical body scheme but, unlike the child-like sex dolls, also the basic age-typical behavioural displays.

Sex robots, such as the Roxxy model by True Companion with 'Frigid Farrah' personality, may offer an outlet to individuals with PI in non-consent/violence, that is, people who are sexually aroused by infliction of physical or mental pain or by overcoming the active resistance of others (Harris et al., 2012; Seto et al., 2012). Robots such as the abovementioned model can mimic the basic signals of non-consent but the range of emotions or reactions they can display (e.g., defiance, resistance, and suffering) is currently fairly limited.

A recent study that mapped the rates of acceptance of sex robots by therapists and physicians in Germany, Austria, and Switzerland (N = 72), showed that 30% of approached experts could imagine using sex robots for patients with paraphilic disorders (based on ICD-10), although contrasts between respondents' opinions on this subject were high. Respondents stressed that the benefits of SRE must be decided individually for each specific patient. For some, it could offer an opportunity to express their sexuality with robot as a substitute, whereas for others, it could intensify their sexual urges and lower barriers to committing a sexual offence (Eichenberg et al., 2019). The survey also reported significant differences in attitudes towards the use of sex robot in therapeutic setting between younger and older therapists, with younger therapists being more open to the subject (Eichenberg et al., 2019).

Parallel information regarding the acceptance of and desire for SRE among potential users is largely missing. The goal of this study is to fill in this knowledge gap: after all, willingness to engage with sex robots would be a necessary prerequisite of any potential therapeutic use. Our aim is to explore the level of desire to engage in SRE in individuals with PI, particularly those for whom finding a desired partner is unrealistic and/or illegal (e.g., individuals with PI in minors) or at least difficult and mostly unsatisfying because their partners' sexual behaviour is not complementary to their PI (e.g., individuals with PI in non-consent and/or sexual violence).

First, we explore the percentage of men in a representative sample of Czech population interested in SRE and the percentage of men with PI in minors and in non-consent/violence interested in SRE. We focus solely on men because paraphilic interests seem far more prevalent amongst men than women (Bártová et al., 2021; Bouchard et al., 2017). Secondly, we investigate the differences in SRE desire between the abovementioned samples. In particular, we hypothesise that due to the impossibility to fully express their innate sexual desires with actual people without harming a child/adult and breaking the law, both of these groups with PI would express greater desire in SRE than men in the general population (control group). Furthermore, we expect that younger participants would be more open to the idea of SRE due to their generally greater acceptance of new technologies (Eichenberg et al., 2019), which is why we will control for the effect of age in a complex model which analyses the differences in the level of desire for SRE across the groups.

### 3. METHODS

The prevalence of SRE desire in the general population was assessed using a sample of Czech men engaged in an online representative survey on 'Love and intimacy in the Czech population'. The sampling was conducted by a respected sociodemographic agency. Separately, a sample of men who met the criteria of PI in minors and PI in non-consent/violence was pre-screened from an online pool of Czech respondents to assess the prevalence of SRE in the two target groups. All participants completed a questionnaire which contained a question regarding their desire for SRE. They expressed their level of agreement with the following statement 'I desire sexual experience with a sex robot/doll.'

using a 4-category ordinal scale (strongly disagree, disagree, agree, strongly agree). The study was approved by the Ethics Committee of the National Institute of Mental Health under the Nr. 41/15.

### 3.1. A representative sample of Czech men (control group)

Respondents were recruited online from a national pool of respondents using the following strata: sex, age, education, region, and size of the place of residence to represent general Czech adult male population. The study was part of a survey project ‘Love and intimacy in the Czech population’, which took place on 8–31 January 2020. All respondents were Czech citizens, fluent in Czech, and 18+ years of age. The sampling procedure was conducted by a respected sociodemographic agency, STEM / MARK ([www.stemmark.cz](http://www.stemmark.cz)), using a Czech National Panel of 55,000 active panellists and a Dialog panel of 10,000 active panellists (<https://www.nationalpanel.eu/>). The procedure was compliant with the ICC/ESOMAR International Code of Marketing and Social Research (<https://www.esomar.org/>). For detailed information on the sampling procedure, see Table 1.

Table 1

The procedure of selection of male respondents, with interim and final sample size and total response rate

Stages of the selection process, reason for exclusion	N
Approached	3,748
Not surveyed due to quota fulfilment	15
Survey not completed	258
Complete answers entered into analyses	806
Response rate	22%

### 3.2. The sample of men with PI

In parallel with the national representative survey, respondents with PI were pre-screened from the Czech National Panel. Men who participated in a national survey of sexual behaviour and preferences in 2016 (see Bártová et al., 2021) were asked whether they would be willing to participate in a project mapping the sexual behaviour and needs of people with PI for a newly launched project of primary prevention of sexual offending in the Czech Republic (Krejčová et al., 2020). The survey was held on 8–7 February 2020. A total of 5,422 individuals were approached, 753 did not complete the survey, and inclusion criteria for PI target groups were met by 135 respondents.

Inclusion in PI target groups was assessed based on answers to screening questions focused on sexual interests. PI was assessed using a five-point Likert scale (ranging from ‘definitely not’ to ‘definitely yes’). Respondents were asked whether they find the idea of the following activities sexually arousing: Firstly, ‘Intimate contact with a minor without physical signs of adolescence (up to 12 years of age)’ and ‘Intimate contact with pubescent girls/boys (minors with signs of adolescence aged 12–15 years)’. Answering ‘yes’ or ‘definitely yes’ (i.e., answer 4 or 5 on the Likert scale) to either of these items resulted in inclusion in the group with PI in minors (N = 48). Secondly, we asked respondents whether they found the following sexually arousing: ‘Complete immobilisation of a stranger (female or male), potentially using violence, and preventing them from resisting you’; ‘stalking and seizing a stranger’; ‘somasochistic activities involving physical or mental subordination or humiliation’, and ‘somasochistic activities that involve beating or other forms of torture’. Answering ‘yes’ or ‘definitely yes’ (i.e., 4 or 5 on the Likert scale) to either of these items resulted in respondent’s inclusion in a group with PI in non-consent/violence (N = 57). Respondents who met both criteria (N = 30) were not included in the latter analysis.

### 3.3. Statistical analysis

Data analyses were conducted on an IBM SPSS 24.0 (IBM Corp., 2016). First, we assessed the prevalence of desire for SRE in each group using a SRE scale (completely disagree/disagree/agree/completely agree). Additionally, we transformed the scale indicating agreement with desiring a SRE into a binary variable ('completely disagree' or 'disagree' transformed into 'no'; 'agree' or 'completely agree' into 'yes'). Then we conducted a two way-contingency table analysis with Chi-Square Test of Independence to evaluate whether group membership was associated with SRE desire. The two variables were membership in a group (control, PI in minors, PI in non-consent/violence) and binary SRE desire. To explore differences between the groups, a Chi-Square Test was conducted for the control group vs. PI in minors and control group vs. PI in non-consent/violence.

Next, we ran a CATREG analysis with SPSS Optimal Scaling option to examine the effect of group (control, PI in minors, PI in non-consent/violence) and age on SRE desire rated by scale. Normality of the raw data was checked using a procedure suggested by Field (2018): it showed that the data were not normally distributed, and nonparametric tests were to be preferred.

Group was scaled as a nominal variable, age as a numeric one, and desire for SRE as an ordinal variable (completely disagree/disagree/agree/completely agree), with the latter two variables discretised by the means of ranking. Then we selected a random initial configuration. The analysis was followed by multiple Mann–Whitney (M–W) U tests for pairwise comparisons. Effect sizes represented by Pearson's  $r$  for M–W U tests were computed after Rosenthal (1991) as  $r = \frac{z}{\sqrt{N}}$ . The association between age and SRE desire was computed with Spearman's  $\rho$ , while effect size  $R_s^2$ , interpreted as a proportion of variance in the ranks which the two variables share, was computed by squaring its value. Practical significance was assessed as effect size anchored to a minimum of  $r = .2$  (Ferguson, 2009).

## 4. RESULTS

A detailed summary of descriptive parameters of the groups is presented in Table 2.

Table 2

Distribution of SRE desire scale variable and age categories across all groups. Percentages are given relative to the total number of men in each group

	Control group (N = 806)	PI in minors (N = 48)	PI in non-consent/violence (N = 57)
<b>SRE scale</b>			
completely disagree	476 (59%)	13 (27%)	22 (39%)
disagree	187 (23%)	17 (35%)	20 (35%)
agree	116 (14%)	13 (27%)	12 (21%)
completely agree	27 (3%)	5 (10%)	3 (5%)
<b>Mean age (yrs ± SD)</b>	51 ± 16	46 ± 14	48 ± 14
<b>Age category</b>			
18–29	90 (11%)	4 (8%)	7 (11%)
30–44	232 (29%)	22 (46%)	17 (30%)
45–54	155 (19%)	8 (17%)	11 (19%)
55+	329 (41%)	4 (29%)	22 (40%)

SRE desire was expressed by 18%, 37.5%, and 26% of respondents in the group control, group with PI in minors, and group with PS in non-consent/violence, respectively (Table 3).

Table 3

Distribution of SRE binary variable across all groups. The percentages are given relative to the total number of men in each group

	Control group (N = 806)		PI in minors (N = 48)		PI in non-consent/violence (N = 57)	
	n	Relative frequency [95% CI]	n	Relative frequency [95% CI]	n	Relative frequency [95% CI]
<b>SRE binary</b>						
No	663	82% [79, 85]	30	62.5% [49, 76]	42	74% [63, 85]
Yes	143	18% [15, 21]	18	37.5% [24, 51]	15	26% [15, 37]

Across the three groups, we found a significant difference in the distribution of binary SRE desire ( $X^2(2) = 13.256$ ;  $p = 0.001$ ; Cramer's  $V = .121$ ). The control group and group with PI in minors differed significantly in expressed binary SRE desire ( $X^2(1) = 11.56$ ;  $p = 0.001$ ; Phi  $\phi = -.116$ ). Between the control group and group with PI in non-consent/violence, expressed desire for SRE did not significantly differ ( $X^2(1) = 2.617$ ;  $p = 0.106$ ; Phi  $\phi = -.055$ ).

Categorical regression (CATREG) model explained nearly 7% of variation in SRE desire scale ( $R^2 = .069$ ;  $R^2_{adj} = .065$ ). The model was statistically significant ( $F(3,907) = 22.25$ ;  $p < .001$ ) and SRE desire scale was significantly predicted by both group membership ( $\beta = .159$ ;  $F(2) = 20.17$ ;  $p < .001$ ) and age ( $\beta = -.195$ ;  $F(1) = 38.48$ ;  $p < .001$ ).

Multiple Mann–Whitney (M–W) U tests for pairwise comparisons revealed that the group with PI in minors (N = 48) differed from the control group (N = 806): M–W U = 12,577.00;  $p < .001$ ;  $r = .16$  (median<sub>minor</sub> = ‘disagree’, median<sub>control</sub> = ‘completely disagree’). The situation was parallel for a comparison between the group with PI in non-consent/violence (N = 57) and the control group: M–W U = 18,286.50;  $p < .01$ ;  $r = .10$  (median<sub>non-consent/violence</sub> = ‘disagree’; median<sub>control</sub> = ‘completely disagree’; see Fig. 1). Nevertheless, neither of the differences was practically significant because the size of the effects did not reach the recommended minimum effect size for a ‘practically’ significant effect in the context of social science (Ferguson, 2009).

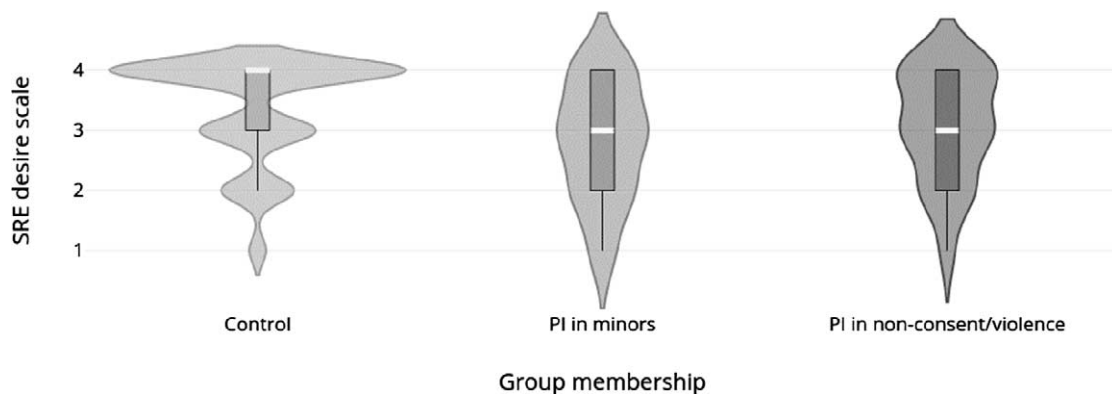


Fig. 1. A violin plot showing expressed SRE desire rated on a four-point scale (1 – completely agree, 2 – agree, 3 – disagree, 4 – completely disagree) by groups.

Visual explorations revealed that younger respondents tended to be more accepting of the idea of sex with a robot, but the size of this effect only reached the recommended minimum effect size for a



‘practically’ significant effect (Ferguson, 2009): Spearman’s  $\rho = .204$ ,  $p < .001$ ,  $N = 911$ ,  $R_s^2 = .042$ .

## 5. DISCUSSION

Our study explored desire for a sex robot experience (SRE) in three groups of male respondents: first, a general sample of the Czech population, second, individuals with PI in minors, and third, individuals with PI in non-consent/violence. We expected both target groups (with PI in minors and with PI in non-consent/violence) to have a greater desire for SRE than the control group. We also expected that younger individuals would express greater SRE desire. The proportion of interested individuals ranged from 18% to 37.5% across groups. Statistical differences in the desire for SRE were found between the control group and the group with PI in minors but not between the control group and group with PI in non-consent/violence. Differences between the control group vs. group with PI in minors and the control group vs. group with PI in non-consent/violence in the desire for SRE were calculated using a model controlled for the effect of age. Differences between the groups were not practically significant (Ferguson, 2009) and the effect of age reached only the recommended minimum effect size (Ferguson, 2009).

The control sample expressed the least desire in SRE of all groups (18%). The desire for SRE in our control group was lower than that of respondents from a general US population sample (70%; Scheutz and Arnold, 2016) but higher than in the Malaysian sample (9%; Edirisinghe and Cheok, 2016). It should be noted, though, that studies by Scheutz and Arnold (2016) and Edirisinghe and Cheok (2016) used small convenience samples ( $N = 100$ ,  $N = 32$  respectively), whereas our control group was a representative sample of Czech male population ( $N = 806$ ) recruited online from a national pool of respondents. Other reasons for different levels of desire for SRE may include differences in the cultural background, which could affect openness to new technological advances, or the mean age of respondents.

Although differences in the desire for SRE did not reach the level of practical significance (Ferguson, 2009) across the groups, we found that a relatively greater desire for SRE was expressed by the group with PI in minors. This could be attributed to the fact that persons with PI in minors cannot fully express their innate sexual desires without violating the law, which might motivate them to look for alternative routes of sexual expression. A sex robot might be perceived as a strategy of managing their PI.

Individuals with PI in non-consent/violence also expressed a greater desire for SRE than the control group. This might be associated with either their general greater interest in impersonal sexual encounters, reflected in their greater use of commercial sex services (Farley et al., 2011; 2017), or with perceiving SRE as a way to satisfying one’s PI without inflicting harm by sexual assault or rape.

The minimal effect of age on SRE desire was surprising because younger individuals are thought to be more accepting of new technologies and novel sexual experiences. Along similar lines, Eichenberg et al. (2019) reported that younger therapists were more open regarding a possible use of sex robots as part of therapy than older therapists were. On the other hand, Scheutz and Arnold (2016) reported somewhat different results: in their study, younger people did not express a greater acceptance of sex robots than older respondents. On the contrary, younger people were less accepting of the idea of interacting with sex robots rather than with prostitutes than older people were Scheutz and Arnold (2016). It might be due to the fact that younger generations are sensitised to issues pertaining to consent and ethical sexual conduct.

## 6. LIMITATIONS AND SUGGESTIONS FOR A FUTURE RESEARCH

The study explored the prevalence of desire for SRE across three groups. The results should be interpreted cautiously for the following reasons: First of all, recruitment strategies for the samples and the numbers of respondents across groups differed, with the control group being distinctly larger than either of the PI groups. This is a consequence of the way the target groups were defined (since our aim was to recruit people with a potential medical diagnosis): by their nature, samples of people with PI cannot be representative. Secondly, the study did not explore respondents' preferences regarding sex robot's features (apparent age, physical appearance, or behavioural displays). We can only speculate whether such preferences would indeed reflect, in the relevant groups, the nature of the PI. Instead, we only assume that people with PI in minors would prefer child-like robots with age-typical behavioural displays and people with PI in non-consent/violence would choose adult-like sex robots with clear displays of resistance or strong negative emotions. Thirdly, the survey did not include a question whether respondents would welcome a sex robot as part of their therapy, and it should be noted that expressed SRE desire is not the same as interest in using a sex robot as part of therapy. And finally, the survey insufficiently differentiated between the terms 'sex robot' and 'sex doll' when asking about respondents' interests: the statement in point was worded as 'I desire sexual experience with a sex robot/doll.' Sex dolls may be more familiar to respondents because they have been on the market much longer than sex robots and they might have a connotation of passivity. As a consequence, respondents may have failed to consider the sex robots' interactive features.

These shortcomings should be considered and addressed in future research to help us better understand the potential of sex robots in therapeutic settings. Finally, as noted above, the present study did not aspire to solving the question of whether sex robots are a suitable therapeutic tool for people with PI or whether they could play a role in the potentiation/suppression of sexual offending behaviour.

Exploration of desire for SRE within the clinical population is a prerequisite for the currently extensively developing discussions about the use of sex robots in clinical management of paraphilic disorders. Our study is the first to provide data in this direction.

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