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Recent research on a risk assessment tool for child pornography offending suggests that admission of sexual interest in children is a risk factor for any sexual recidivism. Admission is easily vulnerable to lying, however, or to refusals to respond when asked about sexual interests. This may become a particular issue when individuals are concerned about the potential impact of admission of sexual interest on sentencing and other risk-related decisions. In this study, we identified the following behavioral correlates (coded yes/no) of admission of sexual interest in children in the risk tool development sample of 286 men convicted of child pornography offenses: (a) never married (54% of sample), (b) child pornography content included child sexual abuse videos (64%), (c) child pornography content included sex stories involving children (31%), (d) evidence of interest in child pornography spanned 2 or more years (55%), (e) volunteered in a role with high access to children (7%), and (f) engaged in online sexual communication with a minor or officer posing as a minor (10%). When summed, the average score on this Correlates of Admission of Sexual Interest in Children (CASIC) measure was 2.21 ($SD = 1.22$, range 0–6) out of a possible 6, and the CASIC score was significantly associated with admission of sexual interest in children, area under the curve (AUC) = .71, 95% CI [.65, .77]. The CASIC had a stronger relationship with admission in a small cross-validation sample of 60 child pornography offenders, AUC = .81, 95% CI [.68, .95]. CASIC scores may substitute for admission of sexual interest in risk assessment involving those with child pornography offenses.

Keywords: risk assessment, child pornography, sexual interest, sexual offending

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Pedophilia is clinically defined as a sexual attraction to prepubescent children (American Psychiatric Association, 2013; World Health Organization, 2015). Hebephilia is a less well known or studied age attraction to pubescent children (Blanchard et al.,

2009). For practical purposes, pedophilia and hebephilia are very similar to each other, with significant correlations between indicators of each (Stephens, Seto, Goodwill, & Cantor, in press). Pedophilia and hebephilia (either *pedohebephilia* or pedophilia alone under the ICD-10) can be assessed in different ways (Seto, 2008, 2013). Each have their advantages and disadvantages. The most direct way is to ask someone about their sexual interests in adults and in children, through interviews or questionnaires. This method is the only way to ask about sexual thoughts, fantasies, or urges; these aspects must otherwise be inferred from behavior or other sources of information. Self-report can also be useful in gathering information from individuals with pedophilic sexual interests who have not offended or those who have committed undetected sexual crimes such as sexual contacts with children or child pornography use. Self-report is vulnerable, however, to manipulation (e.g., someone denies being sexually interested in children to avoid negative consequences).

Pedohebephilia can also be inferred from behavior, for example, based on officially recorded information about sexual contacts with children (e.g., number of prior charges for sexual crimes), child victim characteristics (e.g., number of child victims), or child pornography use. The Screening Scale for Pedophilic Interests (SSPI) and its revision were developed as proxy measures for phallometrically assessed sexual arousal to children (see below) when phallometric testing is unavailable (Helmus, O'Ciardha, & Seto, 2015; Seto & Lalumiére, 2001). The original SSPI had four

items, representing well-established child victim correlates of pedophilic sexual arousal: having boy victims; having multiple child victims; having younger child victims; and having unrelated child victims. The revised SSPI has five items, the original four plus a new item about child pornography offending (Seto, Sandler, & Freeman, 2016; Seto, Stephens, Lalumière, & Cantor, 2015). Assessing pedophilia on the basis of behavior has the advantage of not relying on self-report alone or on complicated laboratory procedures. However, this method relies on the person acting upon pedophilic sexual interests: it is not useful for those with pedophilic sexual interests who have not offended or for those with only undetected sexual offenses who deny or minimize details.

Pedohebephilia can also be assessed in the laboratory, for example, through phallometric assessment of sexual arousal to persons in different age categories. This involves measuring changes in penile circumference or volume in the laboratory while the individual is presented with audio or visual stimuli depicting children of different ages and adults. The responses to prepubescent or pubescent children relative to adults are the key indicators; phallometrically assessed sexual arousal to children over adults distinguishes those who have sexually offended against children from those who have committed other offenses, including sexual offenses against adults, and it is a robust predictor of sexual recidivism (Seto, 2008, 2013). This psychophysiological method has the advantage of not relying on self-report or on official records of sexual offending. It is a more complicated procedure, however, and some individuals will refuse to participate because of their concerns about the perceived intrusiveness of the procedure or about what the results might reveal.

More recent work has looked at the validity of alternative laboratory measures, including relative viewing time, visual reaction time (RT), and other methods adapted from the cognitive science field (e.g., Schmidt, Gykiere, Vanhoeck, Mann, & Banse, 2014). Though easier to use and possibly more acceptable to assessment clients, there is less research on the reliability and validity of these methods to detect pedohebephilia. For example, only one peer-reviewed study has reported that visual RT results predict sexual recidivism in the expected manner (Gray et al., 2015), whereas there are over 10 studies supporting the predictive validity of phallometrically assessed sexual arousal to children (Hanson & Morton-Bourgon, 2004, 2005).

Developing a Proxy Measure for Admission of Sexual Interest in Children

As mentioned, self-report in clinical or criminal justice settings can be manipulated, and this is more likely when the stakes are high (e.g., sentencing). Is it possible to develop a proxy variable for self-reported sexual interest in children? We were particularly interested in this question because of the role that admission of sexual interest in children plays in diagnosis of pedophilia (Seto, 2008, 2013), and because admission (or diagnosis) of sexual interest in children is an empirical risk factor in a recently developed risk assessment tool for use with individuals who have committed child pornography offenses (Seto & Eke, 2015).

The Child Pornography Offender Risk Tool (CPORT: pronounced "seaport") is a structured risk assessment checklist for ranking the likelihood that men convicted of child pornography offenses will sexually reoffend in any way, whether with contact or noncontact offenses (Seto & Eke, 2015). In our development study, CPORT scores predicted any sexual recidivism in the full sample of 266 child pornography offenders, followed for 5 years. It also predicted any sexual recidivism among the subsample with any other offending or with a known contact sexual offense. The CPORT did not predict sexual recidivism among individuals with child pornography-only offenses, because of the low base rate of sexual recidivism in this group. However, the lower risk of individuals with child pornography-only offenses is reflected in the fact that their CPORT scores would be lower than those of individuals with other criminal history, with a maximum score of 4 out of 7. In Seto and Eke (2015), we did not recommend using the probability estimates without further validation research using larger samples. We thought the CPORT could still be useful for ranking individuals by risk score, and to provide a structured way of reporting information to other stakeholders.

The seven CPORT items are: (a) age at the time of the index investigation, (b) any prior criminal history, (c) specifically, any contact sexual offending (pre or at index), (d) any failure on conditional release, (e) indication (admission or diagnosis) of sexual interest in prepubescent or pubescent children, (f) more boy than girl content in child pornography, and (g) more boy than girl content in other child related materials. The fifth item is the focus of this study: individuals under investigation were asked, or spontaneously shared information, about their sexual interest in children during police interviews or other interactions.

Present Study

The purpose of the present study was to identify correlates of admission of pedohebephilic sexual interests that would usually be available to police investigators, a key user group for the CPORT. Our interest in identifying correlates was twofold: (a) self-report is vulnerable to manipulation, so creating a proxy measure based on more objective information would be useful in the clinical assessment of pedophilia or hebephilia; and (b) we wanted to determine if a substitute CPORT item could be created because admission of sexual interest in children is a risk factor and it will become vulnerable to faking if the measure becomes better known.

We focused on variables that we thought would be more difficult to fake than self-reported interests and that could be reliably and relatively easily obtained by police investigators and that then could be provided to subsequent risk assessors. We focused on information available to investigators, rather than subsequent clinical assessors, because the CPORT was originally designed to be a police tool for prioritizing child pornography investigations, and police investigation files were the sources of our data. This file information included demographic characteristics, criminal history, child pornography offending behavior (e.g., whether child pornography content was organized, length of time involved with child pornography), or the type of child pornography collected (e.g., younger children in images, text stories relating to sex with children, Japanese-style "anime" involving children). Other sources of information that might also be relevant to the identification of sexual interests in children, such as phallometric testing of sexual arousal patterns, were not considered because this information would not be readily available to police investigators (or even clinicians, in some cases).

Consistent with previous work, we predicted that never having been married or lived common-law would be a significant predictor of pedohebephilic sexual interests, as would having prior sexual offenses, greater child pornography involvement as indicated by organization or time spent collecting child pornography, child pornography content (images of younger children, multiple forms), and interest in seeking contact with children. We were also interested in the comparison between the amount of child pornography and the amount of adult pornography. However, adult pornography is not illegal, therefore we had few cases with exact numbers or counts to compare with the child sexual material.

Method

Participants

Our sample was comprised of 286 men convicted of child pornography offenses, as originally reported in Seto and Eke (2015). These men were investigated by 10 different police services in the province of Ontario, Canada. There was no preselection of cases; cases were included if there was sufficient information to code study variables. The police investigations took place between 1993 and 2006, with 93% of investigations occurring from 2000 onward. Most (89%) of the cases involved the use of online technologies to access child pornography, although it might not be the only way the individual collected the material and they may not have been detected by police due to their online activity (Eke & Seto, 2013).

We did not have information on an admission or diagnosis of pedophilia or hebephilia in 14 (5%) cases; of the remaining, a third ($n = 109$, 40% of this subsample) admitted to police a sexual interest in children or in child pornography, with 89 admitting a sexual interest in prepubescent children that could be indicative of pedophilia and 34 admitting a sexual interest in pubescent children that could be indicative of hebephilia. Some individuals admitted both pedophilic and hebephilic sexual interests. Our coding was strict in that only clear statements of sexual interest were included; of those who admitted sexual interest, some indicated their feelings were wrong or unacceptable and some indicated their wish to receive help for their thoughts and fantasies. In the 14 cases where we had no information about sexual interest, it was due either to missing interview information or police not asking about sexual interests.

We also coded collateral evidence of a diagnosis of pedophilia or hebephilia (e.g., information from a mental health assessment); 37 in our sample (13%) had a formal diagnosis of pedophilia or hebephilia known at the index offense. In total, 113 (40%) made an admission of sexual interest in children and/or had evidence of a formal diagnosis of pedophilia or hebephilia (as paraphilia not otherwise specified). Most (33, 89%) of those who had evidence of a diagnosis of pedophilia or hebephilia also admitted (to police) their sexual interest in children and hence we later refer to the group as those who "admit" to sexual interest in children. Overall, however, the majority of the individuals in our sample who admitted sexual interest in children ($n = 76$; 70%) had no known diagnosis at the time of the index offense; some had no prior sexual charges (89%) and therefore less reason to have had an assessment, and for others, any assessment information was perhaps not available to police investigators.

Procedure

Data analyzed for this study are described in more detail in Seto and Eke (2015). Briefly, we obtained information on our sample through coding from police files for closed investigations resulting in convictions for one or more child pornography offenses. Some in our sample may have incurred other charges as well, including contact sexual offenses. Files consistently included the following information: police occurrence reports; investigating officer notes; video or transcripts of interviews with those arrested or charged for the child pornography as well as witnesses; forensic computer analysis reports; and details of the pornography content seized by police, usually in digital format. Each of these files typically took one half to 3 days to code. Both the development study (Seto & Eke, 2015) and the validation study (Helmus, Eke, & Seto, 2016) received ethical approval from the Research and Ethics Board at the Royal Ottawa Health Care Group, Ottawa, Canada.

Our coding domains were: (a) demographic characteristics such as marital status; (b) collection content such as child pornography, child nudity and child other and whether there were child pornography video and text or other types of paraphilic interests (e.g., sadism, fetishism); (c) child pornography collecting behavior such as morphing of child pornography images and use of nonprivate computers; (d) contact with children or behavior associated with seeking contact; and (e) criminal history. Our focus was on variables that could be scored easily using information considered generally available to police and clinicians, that have either been identified as correlates of pedophilia (i.e., never married) or candidates we have previously hypothesized as relevant to sexual interest in children (e.g., Eke, Seto, & Williams, 2011; Seto, 2013).

Most of the variables we examined are self-explanatory from their labels. Individuals were considered to be never married if there were no reports of a common-law relationship (living together as intimate partners) or marriage. Research assistants estimated the proportions of total child content (in 5% increments) of child pornography, child nudity and other child content across three age categories (infant/toddler, prepubescent, or pubescent). Child pornography was considered to be organized if files were descriptively named and/or organized into separate folders. Morphing involved the use of photo manipulation software, for example, adding the face of a known child to the body of an unknown child depicted in pornography downloaded from the Internet or cutting and pasting from printed images. Use of a nonprivate computer in child pornography offending included computers used by other family members, public computers (e.g., libraries or cybercafes), and work computers.

Most of our sample (90%) also had adult pornography, though as stated earlier, we were often missing details such as total number of images because this material is not illegal and thus police may not record this information. Many individuals (87% of the 240 cases where we could review the collection) had pornography depicting paraphilic themes such as sadism, masochism, or bestiality. We distinguished between the appearance of any paraphilic pornography and pornography content that was considered potentially indicative of a paraphilic sexual interest. This reliable judgment was made by research assistants on the basis of the amount and organization of content (e.g., descriptively labeled filenames in their own folders). The most common indicative

paraphilic themes were sadomasochism (18%), bestiality (15%), fetishism (10%), and urophilia/coprophilia (10%).

In developing the CPORT, we were also interested in the possible effects of access to children beyond that of being a parent, such as employment or volunteer positions (e.g., teacher, sports coach, day care provider), online interactions with minors, and having contact information about specific children that we considered to be outside of what would be necessary for work or other obvious reasons (e.g., a teacher with a class list or an individual with contact information for child relatives). Examples of this specific child information included where children lived, ratings of their appearance, or descriptions of the individuals' sexual attraction to identifiable children. We specifically coded information about online sexual interactions with minors; 28 offenders (10%) were known to have used the Internet for sexual chat with a minor (or an undercover officer posing as a minor) either prior to or as part of the index child pornography offending.

We reported our interrater reliabilities in Seto and Eke (2015): Intraclass correlation coefficients (two-way random model, abso-

lute agreement) for all reported continuous variables were a minimum of .70 for single measures and .80 for average measures; kappas were .75 or higher for categorical variables.

Results

Descriptive characteristics of the sample are reported in Table 1, for the full sample and then distinguishing those who admitted (or were diagnosed with) a sexual interest in children. To identify correlates of admission/diagnosis (henceforth, admission) of sexual interest, we first examined univariate associations using chi-squared tests and receiver operating characteristic (ROC) analysis (see Table 1); we kept the scoring simple, with each variable being answered positively for a score of 1 or negatively for a score of 0. (See the online supplemental materials.)

The following six variables, with base rates in the sample indicated in brackets, predicted admission of sexual interest in children: (a) never married (54%), (b) child pornography content included child sexual abuse movies/videos (64%), (c) child por-

Table 1

Potential Predictors of Admission of Sexual Interest in Children

| Variables (positively coded) | CPORT Item 5: admission and/or diagnosis; $N = 113$ (40% of the sample) | | |
	Variable details (full sample; $N = 286$)	Univariate	AUC 95% CI
Demographic			
Never married	$n = 154$ (54%) missing = 1	$\chi^2(1) = 8.98, p = .003$	.59* [.52, .66]
Content			
More infant/prepubescent than pubescent child pornography	$n = 200$ (70%) missing = 0	$\chi^2(1) = 1.19, p = .276$	.53 [.46, .60]
Has child pornography movies	$n = 183$ (64%) missing = 0	$\chi^2(1) = 7.85, p = .005$	.58* [.51, .65]
Has child sex stories	$n = 89$ (31%) missing = 10	$\chi^2(1) = 4.71, p = .030$	.57* [.50, .65]
Child oriented anime	$n = 111$ (39%) missing = 0	$\chi^2(1) = 3.75, p = .053$	.56 [.49, .63]
More boy than girl child pornography	$n = 45$ (16%) missing = 0	$\chi^2(1) = 5.79, p = .016$	.60* [.51, .69][a]
Any other paraphilic material (i.e., other than pedophilic material)	$n = 207$ (72%) missing = 1	$\chi^2(1) = 1.44, p = .230$	.53 [.46, .60]
Sexually violent material (indicative; i.e., sadism, coercion)	$n = 54$ (19%) missing = 1	$\chi^2(1) = 1.08, p = .299$	.53 [.46, .60]
Collecting behavior			
Content more organized (high)	$n = 57$ (20%) missing = 49	$\chi^2(1) = 4.54, p = .033$	.56 [.49, .64]
Interest in child pornography spanned 2 or more years	$n = 156$ (55%) missing = 47	$\chi^2(1) = 19.81, p < .001$	.64* [.57, .71][b]
Interest in child pornography spanned 3 or more years	$n = 113$ (40%) missing = 47	$\chi^2(1) = 18.72, p < .001$	.64* [.57, .71]
Individual morphed images	$n = 17$ (6%) missing = 12	$\chi^2(1) = .115, p = .735$	.51 [.43, .58] inverse
Child pornography found on nonprivate computer	$n = 122$ (43%) missing = 12	$\chi^2(1) = 1.78, p = .182$	.54 [.47, .61]
Contact with children (seeking)			
Works with children (high access; pre or index)	$n = 22$ (8%) missing = 8	$\chi^2(1) = .012, p = .914$	.50 [.43, .57] inverse
Volunteers with children (high access; pre or index)	$n = 21$ (7%) missing = 1	$\chi^2(1) = 7.12, p = .008$	.65* [.53, .78]
Online sexual communication with a child or an undercover officer posing as a child	$n = 28$ (10%) missing = 0	$\chi^2(1) = 6.73, p = .009$	.63* [.52, .74]
Information on specific children (e.g., ratings of attractiveness)	$n = 26$ (9%) missing = 22	$\chi^2(1) = 4.28, p = .038$	.61 [.49, .73]
Criminal history			
Any prior child pornography charges	$n = 17$ (6%) missing = 0	$\chi^2(1) = 4.01, p = .045$	.53 [.46, .60]
Any prior/index contact sex charges	$n = 59$ (21%) missing = 0	$\chi^2(1) = .612, p = .434$	.52 [.45, .59]
Number of prior contact sex charges	$n = 53$ (≥ 1) missing = 3[c]	$F(1, 267) = 23.94, p = .020$	.58* [.51, .65]

Note. Under Variable Details, the value in the brackets is the percentage of the sample with this variable present. Our outcome variable in this table is "admission" of sexual interest in children and this group includes those diagnosed with pedophilic or hebephilic interests; the majority (89%) of those diagnosed also admitted their sexual interest in children to police; however, four individuals did not. The correlates of sexual interest for "admission" versus "admission and/or diagnosis of sexual interest" were the same. CPORT = Child Pornography Offender Risk Tool; AUC = area under the curve; CI = confidence interval.
[a] We excluded CPORT item "More boy than girl child pornography" and the item "Prior contact sex charges" from the Sexual Interest Scale because adding them could artificially increase the CPORT predictive accuracy in cases where Correlates of Admission of Sexual Interest in Children (CASIC) is used as a substitute for Item 5 and these items are already positively scored as part of CPORT. [b] Interest in child pornography span ranged from 0 (anything under 1 year) to 45 years (the highest five outliers, 25 years or longer), and the median number of years collecting was 2. [c] The value indicates that in 53 cases, offenders had one or more prior contact sex charges.
* Indicates a significant AUC (95% CI over .50); the individual item is a significant predictor of CPORT Item 5.

nography content included sex stories involving children (31%), (d) evidence of interest in child pornography spanned 2 or more years (55%), (e) volunteered in a role with high access to children (7%), and (f) engaged in online sexual communication with a minor or officer posing as a minor (10%). The statistically significant variables encompassed multiple domains and we opted to include them all (except CPORT items, to maintain independence from the tool and to avoid double weighting of any items) using logistic regression. For CASIC Item 4, we chose 2 years as the cutoff because it represented the median split for time span and because there was no meaningful difference if we chose 3 years as the cutoff. A test of the model with all six variables was statistically significant, $\chi^2(6) = 35.59$, $p < .001$, indicating that the set of items reliably distinguished between those in the sample who admitted or were diagnosed with a sexual interest in children from those with no admission or diagnosis. Overall, 65% of the cases were correctly classified (73% for "no" and 55% for "yes," indicating the model was more specific than sensitive). Within the model, Item 4 regarding evidence of interest in child pornography over 2 years ($p < .001$, odds ratio [OR] = 3.72, 95% CI [1.92, 7.21]) significantly contributed after controlling for all other variables in the model, with online communication ($p = .054$, OR = 3.02, 95% CI [.98, 9.27]) and volunteering ($p = .097$, OR = 2.64, 95% CI [.84, 8.32]) showing some relevance (Table 2).

We summed the six items for a total possible score of 0 to 6. The average score across the full sample (i.e., including cases where some variables are missing) was 2.21 (SD = 1.22). The CASIC score was a significant and moderately accurate predictor of CPORT Item 5 score (admission or diagnosis of sexual interest in children), $N = 272$, AUC = .71, 95% CI [.65, .77]. The average CASIC score across a subset of 230 cases where there was no missing items was 2.37 (SD = 1.22); this score was also a significant predictor of admission/diagnosis, $N = 220$, AUC = .69, 95% CI [.63, .76].

Following the results of the regression analyses, we also summed the three predictors that had the larger ORs and contributed to the variance at $p < .10$: length of time collecting/accessing, online communication (with a minor or police posing as a minor), and volunteering. This modified CASIC score was significantly and moderately predictive in the full sample regardless of missing, AUC = .68, 95% CI [.62, .75] and in the subsample ($n = 272$) with no missing predictors, AUC = .68, 95% CI [.61, .75].

We examined the 109 individuals who admitted to having a sexual interest in children, omitting the four men who did not admit any interest but were diagnosed with pedophilic/hebephilic disorder; we did this because, from an applied perspective, police would not necessarily have information about prior mental health diagnoses. It is not surprising that the variables that correlated with *admitted and/or diagnosed* were also significant correlates in the admission-only group. We therefore report only one outcome variable in Table 1, and we refer to the correlates as related to admission of sexual interest (rather than admission and/or diagnosis).

We also examined correlates of the subgroup of individuals with evidence of a formal diagnosis of pedophilia and/or hebephilia ($n = 37$); never married AUC = .63, 95% CI [.53, .72], collecting more infant/prepubescent content AUC = .60, 95% CI [.51, .69], and length of time collecting/accessing 3 or more years AUC = .65, 95% CI [.55, .75] were all significantly associated, as was having a prior or index contact sex charge AUC = .63, 95% CI [.53, .74] which was likely the opportunity or catalyst for the clinical assessment.

Validation

We recently completed a validation of the CPORT (see Helmus et al., 2016), with a sample of 86 men convicted of child pornography offenses in the same province. The CPORT showed comparable predictive accuracy in this new sample, predicting any new sexual offending and child pornography recidivism over a 7-year follow-up time. As part of the current study, we also examined the CASIC in the small validation sample. When all cases were included, regardless of missing items, scores ranged from 0 to 6 (M = 1.90, SD = 1.16) and the CASIC score was significantly predictive of CPORT Item 5 ($n = 60$), AUC = .81, 95% CI [.68, .95]. In a subgroup of 38 cases with no missing variables, the CASIC score was again predictive, with AUC = .73, 95% CI [.56, .90]. An AUC over .71 is considered a large effect size (see Rice & Harris, 2005).

The CASIC score regardless of some cases having missing information was as follows: M = 2.14 (SD = 1.21, 95% CI [2.01, 2.26]) and AUC = .73, 95% CI [.67, .78]. The most common missing item was length of time collecting/accessing (81, 22%), followed by text stories (12, 3%), and never married (8, 2%). In the

Table 2

Assessing Predictors of Admission of Sexual Interest in Children (CPORT Item 5)

	Model			
Independent variables	B	SE	Significance	OR [95% CI]
Constant	−1.955	.396	.000	.142
Never married	.342	.300	.255	1.407 [.78, 2.53]
Child pornography movies	.479	.325	.141	1.615 [.85, 3.06]
Child sex stories	.337	.318	.289	1.400 [.75, 2.61]
Interest in child pornography spanned 2 or more years	1.314	.338	.000	3.720 [1.92, 7.21]
Online sexual communication with a child or an undercover officer posing as a child	1.104	.573	.054	3.017 [.98, 9.27]
Volunteers with children (pre or index)	.972	.585	.097	2.643 [.84, 8.32]

Note. Sixty-five percent of cases were correctly classified. Hosmer-Lemeshow test for goodness of fit: p = .682. CPORT = Child Pornography Offender Risk Tool; OR = odds ratio; CI = confidence interval.

subgroup of cases with no missing information, the average score was $M = 2.37$ ($SD = 1.22$, 95% CI [2.22, 2.51]) with an AUC = .70, 95% CI [.63, .76] in predicting admission or diagnosis of sexual interest in children. Overall, the CASIC appears robust for missing items.

CASIC as a Substitute for Admission of Sexual Interest in Children (CPORT Item 5)

To assess CASIC as a substitute for CPORT Item 5 (admission of sexual interest in children) in the prediction of sexual recidivism, we ran two sets of analyses: (a) CASIC as a substitute in cases where CPORT Item 5 was missing, and (b) CASIC as a substitute for CPORT Item 5 in all cases, regardless of the original scoring of CPORT Item 5. This latter analysis could provide an initial indication of the efficacy of CASIC with those who deny sexual interest in children or refuse to respond. We used a score of 3 or more as the criterion for considering CPORT Item 5 to be present because the average CASIC scores ranged from 1.97 to 2.37 (depending on the sample and missing items) and a score of 3 represented the median split in the combined development and validation sample (e.g., 57% scored 2 or lower in the combined sample without missing information, 65% with missing information). Our results indicated that the admission CPORT item could be replaced by CASIC score (Table 3).

Discussion

We found six variables (each dichotomously scored as absent or present) that significantly predicted admission/diagnosis of sexual interest in children: (a) never married, (b) child pornography content included videos, (c) child pornography content included sex stories involving children, (d) evidence of interest in child pornography spanned 2 or more years, (e) volunteered in a role with high access to children, and (f) engaged in online sexual communication with a minor or officer posing as a minor. Not all of the correlates added incrementally in a logistic regression

model, perhaps in part due to low sample size; overall, the six items together better predicted admission of sexual interest than summing the three items with the stronger regression results and there is theoretical support for consideration of all six variables, as per our discussion below.

The six CASIC items are psychologically meaningful (Mann, Hanson, & Thornton, 2010). Never being married or living common-law is meaningful because someone who is sexually attracted to children is less likely to engage in marriage or common-law cohabitation with an adult. Indeed, Blanchard et al., (2007) found that the number of adult sexual partners was inversely related to the degree of sexual arousal to children among those who have child sexual victims, whereas the number of child victims was positively related to pedophilic sexual arousal. Never having been married might also serve as a marker for interpersonal difficulties involving adults, such as poorer social skills, being more comfortable with children than with adults, or being socially isolated or withdrawn (see Seto, 2008, 2013).

Having child pornography videos, child pornography stories, or showing evidence of interest in child pornography spanning 2 or more years may reflect level of involvement with child pornography. Someone who only recently started collecting might be acting more out of curiosity or thrill-seeking, whereas someone who is interested in diverse child pornography content or who sustains this activity (whether continuous or episodic) for 2 or more years is more likely to have pedophilia or hebephilia. Videos are more intense sexual stimuli. At the time of data collection, they were also less common than images, and thus more difficult to obtain; more time needed to be spent finding these videos.

Volunteering in a role with a high degree of access to children may suggest someone who is motivated to be more around children. This is not to suggest that volunteering for youth-serving roles is suspicious on its own; most volunteers have no known history of sexual offending against children or child pornography use. However, among those with a sexual interest in children, volunteering to work with them might be an indicator of emotional

Table 3
Predictive Accuracy of CPORT with a CASIC Score of 3+ as a Substitute for Admission of Sexual Interest (Item 5)

Predictor	Any child pornography recidivism			Any sexual recidivism		
	N	AUC	95% CI	N	AUC	95% CI
Development sample						
CPORT Total	266	.763	.645, .881	266	.737	.631, .843
CPORT (NM)	254	.793	.687, .898	254	.759	.660, .859
CPORT with CASIC score 3+						
Replacing missing Item 5 (NM)	261	.762	.644, .880	262	.737	.631, .843
Substituting for all Item 5 (NM)	254	.803	.704, .903	254	.763	.667, .859
Combined sample						
CPORT Total	346	.740	.637, .884	346	.724	.636, .812
CPORT (NM)	309	.771	.657, .885	309	.752	.658, .845
CPORT with CASIC score 3+						
Replacing missing Item 5 (NM)	327	.739	.625. .853	327	.727	.635, .819
Substituting for all Item 5 (NM)	326	.775	.681, .870	326	.754	.673, .835

Note. CPORT = Child Pornography Offender Risk Tool; CASIC = Correlates of Admission of Sexual Interest in Children; AUC = area under the curve; CI = confidence interval; NM = no missing, none of the cases have missing information.

identification with children and/or pedophilia; those who are sexually interested in children who self-exclude from access or from being alone with children may be exhibiting higher empathy or other protective factors (Babchishin, Hanson, & VanZuylen, 2015). Interestingly, being employed in an occupation with high access to children (e.g., teacher, day care provider) was not correlated with admission/diagnosis of sexual interest in children. Occupation may be a poorer marker of emotional congruence or interest in children than volunteering because people will choose youth-serving occupations for reasons other than wanting to be around children (e.g., desire to make a difference, salaries and benefits). As with volunteers, it is expected that most of those who seek employment in youth-serving occupations enjoy being around children for nonsexual reasons.

Online sexual solicitation was an indicator of sexual interest in children in this analysis, but it is more likely to be suggestive of hebephilia than pedophilia because of the typical ages of the minors who receive solicitations. Analysis of American law enforcement cases involving real minors—not undercover officers posing as minors—revealed no cases involving children under the age of 12 (Wolak, Finkelhor, Mitchell, & Ybarra, 2008). Seto (2013) suggested that this may reflect the fact that children under age 12 would be less likely to be online than adolescents, especially while unsupervised by a parent or other adult. The modal victim age in the National Juvenile Online Victimization sample described by Wolak et al. (2008) was 15, and three quarters of the victims were between the ages of 13 and 15. In a number of ways, those who have offended by sexually soliciting youth online could be compared with those committing statutory sexual offenses in the sense they focused on adolescents under the legal age of consent rather than prepubescent or pubescent children and they may be seeking vulnerable youth as alternates to adult sexual relationships. Sexual communications with minors online could also be an indicator of broader online engagement. If this hypothesis is correct, we would expect these individuals to also be online more in pedophilia forums and sexuality forums (Holt, Blevins, & Burkert, 2010).

Implications

The current research suggests that factors relating to the accessing and collecting of child pornography can themselves be useful in understanding sexual interest in children. Prior research has found child pornography offending itself to be a good proxy for sexual interest in children, though not all those charged or convicted of child pornography have pedophilia (Seto, Cantor, & Blanchard, 2006; Seto, Reeves, & Jung, 2010). The current research could help better identify or screen those with this sexual interest.

The CASIC also appears to be useful in scoring the CPORT, because it can be used as a substitute for admission of sexual interest in children (CPORT Item 5). We demonstrated this in both the development sample and in a new, smaller validation sample. Indeed, substituting the admission item with CASIC score (using a conservative cutoff score of 3) did not impair the predictive accuracy of the CPORT. Given our concern that admissions of sexual interest in children will be affected as individuals become aware of this CPORT item and its potential impact on sentencing

and other decisions, the fact that we can predict admission based on other information available to police investigators is promising.

Limitations

Some of the CASIC items are unlikely to be confounded with admission of sexual interests in children in this data set because police investigators usually interviewed suspects before the results of a computer forensic analysis were available, potentially revealing information about duration of collecting, greater detail on content (presence of text stories or videos), and online activity, including whether they had sexually solicited minors. The remaining items of marital status and volunteering with children, however, might have influenced police questioning because they would often be readily available by questioning the suspect or family members, although not in every case. There is no reason to expect, however, that police knowledge of these items would systematically affect suspect admission of sexual interest.

Admission of sexual interest in children or child pornography is likely to be influenced by other psychological factors such as personality. We might expect, for example, more antisocial individuals to be less willing to disclose a sexual interest in children because they are more willing to lie. We did not have access to psychological assessments in this study, because data were obtained through police investigation files. There is an established line of research looking at denial or minimization of sexual offending that might be relevant, either comparing individuals who admit versus deny their sexual offenses and/or who admit or deny sexual interest in children. Phallometric studies have consistently shown that individuals who admit their sexual interest in children show greater responses to children than those who deny any such interest (e.g., Freund & Blanchard, 1989).

We also did not have information on situational factors that might have influenced admissions. For example, interviewer style and skill might be relevant. Interviewers who are more successful at establishing rapport may get more honest self-report than those who create a hostile or confrontational tone (e.g., Holmberg & Christianson, 2002; Meissner et al., 2014, for impact of interrogation style on confessions). Some interviewers did not ask a direct question about sexual interest in children. We did not have systematic information on interviewers or the circumstances in which interviews took place. Future research drawing from the clinical literature on interview techniques could be fruitful. There is an ongoing line of research on the impact of polygraph interviewing on sex offender disclosure. Putting aside the debate about whether polygraph is valid for lie detection or serves as a "bogus pipeline," polygraph interviewing increases disclosures about unknown sexual offenses (e.g., Ahlmeyer, Heil, McKee, & English, 2000). Similarly, participation in treatment can increase disclosures (e.g., Baker, Tabacoff, Tornusciolo, & Eisenstadt, 2001). In a meta-analysis of studies reporting sexual offending history among online (mostly child pornography) offenders, Seto, Hanson, and Babchishin (2011) reported that approximately half of online offenders admitted contact sexual offending when questioned (e.g., during police interviews, using polygraphy, disclosures in treatment), which can be compared with the one in eight who had an official criminal record for contact offending.

The relative prevalence of admission is likely to be affected by the context in which this study was conducted. First, a large

proportion of the cases were handled by a police service with extensive experience working child pornography investigations (its obscene sexual material unit began in 1975). Investigators have experience to draw upon, whereas less experienced investigators or units might not be as likely to obtain disclosures. Also, these disclosures were made in Canada at a time when sentences for child pornography offenses did not always result in incarceration; mandatory minimum sentencing (in months) only began recently. This can be contrasted to the United States, where mandatory minimum sentences are in years; individuals being investigated in the United States might be unwilling to admit any sexual interest in children or in child pornography as a result, in case such admission is seen as an aggravating factor that increases sentence length.

Future Directions

Future research ideas include validation of the CPORT in other samples of child pornography offenders followed for recidivism, validation of CASIC as a proxy measure for admission of sexual interest in children, specifically as a substitute item for the CPORT, and more broadly as a screening in clinical or research assessments of pedophilia where child pornography use is involved. We are currently engaged in studies addressing some of these research questions.

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