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Factors associated with contact child sexual abuse in a sample of indecent image offenders

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Abstract *This study explored a sample of 244 UK adult male offenders convicted of offences involving indecent images of children (IIOC): 120 had a previous contact child sexual offence (defined as dual offenders) and 124 had no evidence of an offence against a child (defined as non-contact offenders). Offender groups were compared regarding their socio-demographic characteristics, previous convictions and IIOC possession. Key discriminatory factors that differentiated dual offenders were: access to children, previous offence history, sexual grooming and possession of IIOC that depicts similar-aged victims. In contrast, non-contact offenders could be identified from their greater amount and wider range of IIOC possession. The results suggest a homology between Internet behaviours, IIOC possession and victim selection. Implications for law enforcement agencies are discussed in terms of assisting investigative prioritisation by identifying those most at risk of committing sexual abuse against children.*

Keywords *Indecent images of children; child pornography; child sexual abuse; risk assessment; sexual offences*

Introduction

This paper examines the relationship between possession of indecent images of children (IIOC) offences and the risk of contact sexual abuse. IIOC offences have risen in recent years, with this now being recognised as a global problem (Wolak, Finkelhor, & Mitchell, 2009). However, there is very little research from a law enforcement perspective in identifying whether an individual using the Internet to access IIOC is also committing, or is likely to go on to commit, a contact sexual offence against a child (Eke, Seto, & Williams, 2011). With prevalence rates of contact child sexual abusers within IIOC samples (from here on referred to as "dual offenders", Wolak, Finkelhor, & Mitchell, 2011, p. 33) ranging from 1% (Endrass et al., 2009) to 84.5% (Bourke & Hernandez, 2009), this heterogeneity makes understanding and managing these offenders problematic. Thus, there is a need for research in identifying differentiating risk factors for contact abuse to assist in the risk management of these offenders

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(Long, Alison, & McManus, 2013; Seto, 2013). Assessing the risk of IIOC offenders has mainly been explored in terms of risk of future offending, examining personality characteristics and state factors (Elliott, Beech, & Mandeville-Norden, 2013), with little work done from an investigative approach (McManus, Long, & Alison, 2011). This study aimed to further test and validate the exploratory findings of Long et al. (2013) with a larger sample, and with focus on investigative factors available to law enforcement agencies to inform decision-making processes and prioritisation methods. Therefore, many of the variables used within Long et al.'s (2013) study are also examined here.

Defining IIOC

There is significant variance in the legal definitions of IIOC within Europe and the world. In the UK, the Sexual Offences Act (2003) extended the Protection of Children Act (1978) introducing new offences to deal specifically with the exploitation of children through IIOC (Sentencing Guidelines Council, 2007). The Sentencing Advisory Panel (SAP) introduced guidance on the levels of IIOC, which in ascending order indicates the seriousness of the offence (see Table I).

Discriminating between dual and non-contact IIOC offenders

Socio-demographic characteristics. When exploring socio-demographic characteristics, previous research has reported differences between IIOC offenders with contact sexual abuse histories against children and those with no evidence of hands-on abuse. Dual offenders have been found to be older than non-contact IIOC offenders (Elliott et al., 2013; Neutze, Seto, Schaefer, Mundt, & Beier, 2011). Research on contact sexual offenders has indicated a bimodal distribution of age in sexual offenders (peaking at age 13 and again at mid-to-late 30s), with this linked to the type of access to children, living arrangements and relationship status at these age groupings. Dual offenders are more likely to have access to children (Long et al., 2013), live with a partner and their partners' child (Long et al., 2013), be a parent (Elliott et al., 2013) and have higher relationship stability (Seto, Wood, Babchishin, & Flynn, 2012), when compared to non-contact offenders. Moreover, dual offenders were more likely to be unemployed (Neutze et al., 2011; Sheldon & Howitt, 2008), which may give them additional access to children. In contrast, Babchishin, Hanson, and Hermann (2011) found unemployment to be linked to online offenders. However, this was only found when comparing online offenders to the general population.

Previous criminal histories have been reported to be a major dimension in the prediction of risk (Seto, 2013). A recent meta-analysis concluded that around 12% of IIOC offenders have previously been convicted of a contact sexual offence against a child, with this increasing to 55% when using self-report data (Seto, Hanson, & Babchishin, 2011). Most studies have

Table I. *Levels of child abuse imagery (Sentencing Guidelines Council, 2007)*

Level	Description
1	Images depicting erotic posing with no sexual activity
2	Non-penetrative sexual activity between children, or solo masturbation by a child
3	Non-penetrative sexual activity between adults and children
4	Penetrative sexual activity involving a child or children, or both children and adults
5	Sadism or penetration of, or by, an animal

concluded that dual offenders were more likely to have previous criminal histories when compared to non-contact IIOC offenders (Elliott, Beech, Mandeville-Norden, & Hayes, 2009; Long et al., 2013, Neutze et al., 2011, Sheldon & Howitt, 2008; Webb, Craissati, & Keen, 2007). Therefore, criminal histories within IIOC offenders may represent a subgroup of offenders who pose a higher risk of contact sexual abuse, with the type of previous history an additional likelihood factor (Long et al., 2013).

Internet offending behaviours. Long et al. (2013) reported that the two key Internet offending behaviours that have been associated with IIOC possession are sexual grooming and the production of IIOC. These Internet behaviours are seen as an escalation within IIOC offending, from viewing IIOC to communicating their sexual interests with others (Briggs, Simon, & Simonsen, 2011; Sullivan, 2002; Sullivan & Beech, 2004). As highlighted recently by Seto et al. (2012), there are few studies that have been conducted on those who groom or solicit children online, with ambiguity as to whether these offenders share more in common with non-contact IIOC offenders or with contact child sexual abusers. Briggs et al.'s (2011) study was on 51 solicitation offenders, differentiated between 30 contact-driven offenders and 21 fantasy-driven offenders, thus indicating the different function of the offender–victim interaction for those engaging in online solicitation behaviours. This suggests that within online solicitation offenders, a subgroup may exist that restricts their sexual behaviour to the online world (fantasy-driven), with the other group using the Internet to facilitate the abuse of children (contact-driven).

The ability to communicate well and "groom" various individuals (Craven, Brown, & Gilchrist, 2006; Seto et al., 2012; Webb et al., 2007) enables dual offenders to be contact-driven within their use of IIOC (Long et al., 2013; McCarthy, 2010). They are more likely to introduce a face-to-face meeting early if conversing with a child online (Briggs et al., 2011), or use IIOC when access to victims is restricted (Bourke & Hernandez, 2009) or to facilitate abuse (Sheehan & Sullivan, 2010; Tate, 1990), as their main motivation is the sexual abuse of a child. In support of this, dual offenders have been reported to use offline techniques, with their sexual grooming occurring mainly offline (CEOP, 2011; Long et al., 2013), and the production of images tends to be hands-on recording with the offender actively involved (Long et al., 2013; Sheehan & Sullivan, 2010).

Conversely, when examining non-contact offenders, research has found that these offenders tend to use online grooming techniques and produce their IIOC using a webcam. Potential explanations for this have explored the reported social deficits non-contact offenders, or fantasy-driven offenders, may have when engaging with the outside world (Elliott et al., 2013; Laulik, Allam, & Sheridan, 2007).

Quantity and type of IIOC possessed. Currently, only two studies have explored offender group differences regarding the quantity of IIOC possessed, with contradictory findings. McCarthy (2010), in a US study of 107 IIOC offenders, concluded that it was dual offenders who had significantly larger collections of IIOC. Conversely, Long et al. (2013), in a UK study of 60 IIOC offenders, found that it was non-contact offenders who possessed significantly larger collections of IIOC. Research using the RM2000R in assessing the impact of quantity of IIOC on risk of recidivism found that those possessing the highest number of IIOC were categorised as the lowest risk, with 50% of high-risk offenders possessing less than 50 IIOC (Osborn, Elliott, Middleton, & Beech, 2010). This gives support to Long et al.'s (2013) findings that the lower number of IIOC indicates a higher risk of recidivism and vice versa. Some research suggests that Level 5 images are rarely found in an offenders' possession as they are more difficult for the offender to justify the sexual harm to the child (Carr &

Hilton, 2009). These few, yet contradictory, studies highlight the need for more work exploring the impact of the quantity of IIOC in possession, as this may also assist in interpreting the function the image has for the offender.

Lanning (1992) was one of the first authors to postulate that IIOC offenders seek images that fit pre-existing fantasies. This was later supported by Quayle and Taylor (2002). Other research supports this notion that individuals seek out material which is most arousing to them, reflecting their sexual fantasies (Glasgow, 2010; Howitt, 1995; Seto, Maric, & Barbaree, 2001). Previous findings have reported a link between children-related sexual fantasies and later contact sexual offending (Dandescu & Wolfe, 2003; Marshall, Barbaree, & Eccles, 1991), with some reporting it impacting on the modus operandi of the offence committed (Deu & Edelmann, 1997; Quayle & Taylor, 2002; Warren, Hazelwood, & Dietz, 1996).

Recent reports have confirmed that there has been an increase in the severity levels of IIOC available (Internet Watch Foundation, 2008, 2010; Wolak, 2011), and the number of images depicting children under the age of 10 (Internet Watch Foundation, 2012); however, the severity level possessed by an offender and its relationship to contact sexual abuse has barely been explored. Long et al. (2013) found that although IIOC offenders possessed images across all five SAP levels, dual offenders "anchored" on those that depicted adult and child sexual activity (Levels 3 and 4), whereas non-contact offenders preferred images that depicted a lone child sexually posing (Level 1). They suggest that the images possessed reflected their offline sexual behaviours.

In addition, the type of behaviours and individuals featured within the images is a new area of research. Previous research indicated that the majority of images in circulation depict a female victim (Long et al., 2013; Seto, 2011; Steel, 2009; Wolak, Finkelhor, & Mitchell, 2005; Wolak et al., 2009), aged around 10 years old (Gallagher, Fraser, Christmann, & Hodgson, 2006; Webb et al., 2007), in a still format rather than movie (Long et al., 2013; Wolak et al., 2011) and feature a lone male offender (Finkelhor & Ormrod, 2004). When exploring the differences between those with and without contact offences, Long et al. (2013) concluded there were no differences in the gender of children or the average age of the children depicted within the imagery. However, when exploring the average age range of the IIOC victims, dual offenders preferred images of a smaller age range, compared to non-contact offenders. Taken with the anchoring preference in the imagery, this may suggest that dual offenders were more specific in the types of images in their possession. They preferred images that reflected their sexual interests, in terms of the sexual explicitness (SAP level) and general age range of victims. As no other research work has been conducted examining these factors between dual and non-contact IIOC offenders, further investigation is required to see whehter this differentiation still exists in larger samples.

Current study

This paper seeks to explore the differences between those IIOC offenders with previous histories for contact child sexual abuse (CSA; dual offenders) and those with no evidence of such behaviour (non-contact). It focuses on three key areas: (1) socio-demographic characteristics (e.g., previous offending history and living arrangements), (2) Internet activities (e.g., paying for access to IIOC, grooming and production of IIOC) and (3) quantity and type of IIOC possessed, exploring the seriousness of images in their possession including the gender and age of the children. The exploration of these factors and identification of any discriminating features will assist in further understanding the relationship between IIOC possession and CSA.

Method

The main data sample consisted of 244 offenders who had all been convicted of at least one indecent image offence (Table II). All offenders were over the age of 18 at time of arrest.

Within this sample, IIOC offenders were classified according to whether they had been convicted or charged with a contact child sexual offence (Table II), i.e., dual offender. In order to be categorised as a dual child sexual offender, participants had to have at least one IIOC conviction and at least one contact child sexual conviction. Offenders who only had IIOC offences were classified as non-contact. This sample of 244 IIOC offenders contained 120 dual offenders and 124 non-contact offenders.

All offenders were arrested between 8 January 2007 and 25 February 2011. Data collection occurred between May 2009 and August 2011. A stratified opportunistic sampling method was used with offenders selected according to whether information was available on the number and levels of IIOC, with selection continuing until roughly equal numbers of dual and non-contact offenders were reached.

Dual offenders

Offenders were categorised according to whether they had any conviction for CSA. Within the sample of dual offenders, it is possible that an offender had a previous contact offence and later IIOC offence, or the IIOC offence may have come first and a later conviction for a contact offence. Alternatively, the contact and IIOC offence may have been resulted in both offences convicted at the same time.

Around 16% of dual offenders had historical charge/conviction for CSA with no current charge for IIOC and, therefore, were categorised as a dual offender on the basis of an historical charge/conviction. Nearly 13% had a historical CSA, in addition to a later conviction of CSA (dealt with at the same time as their IIOC offence). However, for the majority of dual offenders, their first CSA conviction was dealt with at the same time as their IIOC offence (71.7%).

Procedure

Data were primarily provided by Kent Police, but also included cases from other police forces within the UK. This data-set was part of a series of studies that contributed to the

Table II. *Definitions for IIOC and contact child sexual offender convictions*

Offence	Brief description
Making IIOC (s.1. Protection of Children Act, 1978)	IIOC is downloaded from the Internet or photocopied from another image
Taking IIOC (s.1. Protection of Children Act, 1978)	IIOC is taken in person with a camera or remotely by webcam
Distribute IIOC (s.1. Protection of Children Act, 1978)	IIOC is sent via email, posted on a social network/newsgroup/website.
Possession IIOC (s.160 of Criminal Justice Act, 1988)	IIOC is possessed with no requirement to prove any of the above.
Rape (Sexual Offences Act, s.1 and 5)	Intentionally penetrates the vagina, anus or mouth of a child with his penis
Assault by penetration (Sexual Offences Act, s. 2 and 6)	Intentionally penetrates the vagina or anus of a child with a part of his body or anything else
Sexual assault (Sexual Offences Act, s. 3 and 7)	Intentionally sexually touched a child

development of the Kent Internet Risk Assessment Tool (KIRAT): a risk assessment tool which is currently used by police forces across the UK (CEOP, 2012).

Analysis was guided by previous research suggesting factors to identify and examine. Non-contact and dual offenders were examined and compared across three key areas (socio-demographic characteristics, Internet activity, and quantity and types of IIOC processed), outlined in turn below. Bonferonni corrections were applied to all analyses.

Socio-demographic characteristics

Information was coded such as the age of offender at the time of first IIOC arrest. The relationship status at the time of IIOC conviction was recorded with four possible categories: (1) single, (2) separated, (3) cohabiting partner and (4) married/civil marriage.

Access to children was coded dichotomously. The type of access was also recorded under categories of (1) own children (i.e., biological, foster children), (2) familial access (i.e., the offender was a grandparent or uncle), (3) job access (e.g., schoolteacher) and/or (4) other access (e.g., volunteered in local children's activities, befriended local children within the area). Details of any previous convictions were coded dichotomously. The types of previous convictions were also recorded: (1) previous IIOC offence; (2) child sexual offence, including sexual touching to rape; (3) other sexual offence, for example, adult sexual offences, voyeurism; (4) violent offences which included any offences against the person; (5) any other non-violent and non-sexual offences; (6) drink or drug-related offences which included driving whilst under the influence; and (7) convicted on three or more separate occasions.

Internet activity

Offenders who recorded IIOC webcam footage of children were categorised as producers (see Table II). An offender could be classified as either dual or non-contact and still produce their own IIOC. This is because some offenders who were convicted of IIOC were producing IIOC via webcam, or covertly filming IIOC (n = 18) with no contact offence committed. Other offenders were actively part of the production and abuse that occurred within the IIOC (n = 53).

Grooming behaviour was catagorised dichotomously (present or absent). Grooming method was categorised as online, offline, or both. An offender was categorised as engaging in grooming behaviour online if he was communicating online with a child in a way that was sexual or encouraged sexual behaviour. This could be chatting in a sexual way and/or arranging/encouraging a child to meet. Offline grooming behaviour included evidence that the offender had access to a child and was manipulating their trust in some form (whether through financial inducements or befriending a neighbourhood child) to achieve sexual satisfaction. Most offenders within the sample who were coded as groomers were not convicted of grooming (s.15 Sexual Offences Act, 2003). This was because the offence of grooming is extremely difficult to prosecute and convict (Davidson et al., 2011; European Online Grooming Project, 2012).

All of the following variables were coded as either present or absent: paid for access to IIOC (usually via credit card with evidence of their transaction); possessed adult pornography; distributed IIOC, this could be done either via email, messenger, in person, text message, peer-to-peer); and destroyed IIOC, this included those offenders who would delete IIOC either occasionally or regularly. Also coded was the offenders' response in the police interview, which gave four possible mutually exclusive responses: (1) no comment; (2) denied offences; (3) partial admission, where they would admit part of their offending, but may deny

or lie about the full scale of their behaviour; and (4) full admission of their offending behaviour.

Quantity and types of IIOC possessed

Any IIOC identified on an offender's computer was viewed and assessed by specifically trained investigators who categorised each IIOC according to the Sentencing Guidelines seriousness criteria (see Table I).

On some investigations, very large amounts of IIOC were identified where categorising all images would be extremely resource-intensive (e.g., one offender in this sample possessed almost 200,000 IIOC, with 74% of his possession categorised). Therefore, all IIOC were viewed in order to determine whether the offender has committed direct contact offences against a child. Then, as a minimum, the first 20,000 IIOC were categorised using SAP levels and 10% of any above that number. Regarding the data used within this study, all offenders' IIOC had been viewed with an average of 79.65% categorised (SAP levels) by investigators.

Investigators also provided a schedule of the IIOC viewed which gave details regarding the gender, approximate age and sexual action of a proportion of the IIOC possessed. Movies were described in detail. The schedule of information was also used to triangulate data sources, examining the gender of victims. If an offender possessed IIOC that depicted over 80% of a particular gender, this was categorised as his IIOC gender preference. The rationale behind using this cut-off point was to reflect the general trends in the gender of IIOC in circulation, which on average ranges from 69% (Wolak et al., 2011) to 79% (Steel, 2009) of female-depicted IIOC, thus over 80% was deemed to reflect a sexual preference for that gender. Anything less than this resulted in the IIOC gender coded as "both genders". For age comparisons, as above, the investigator who viewed the IIOC gave an indication whether there was an age preference within their possession. Again, this was confirmed by the researcher examining the schedule of information, which details each individual IIOC. Where IIOC included two or more victims, the median age and range were taken per IIOC.

The offence of possession of extreme pornographic images is included in Part 5, Sections 63 to 67 of the Criminal Justice and Immigration Act (2008) and was coded as present or absent.

Inter-rater reliability was assessed by comparing the coding of the first author with a research student. One hundred randomly selected offenders were examined, resulting in excellent inter-rater reliability: Pearson's r = .87 or higher for continuous variables and Kappa = .88 or higher for categorical variables.

Data analysis

Normality tests were conducted for each variable and according to the results either non-parametric or parametric tests were run. Differences between dual offenders and non-contact offenders were explored using chi-square test for categorical data (e.g., previous convictions), Mann–Whitney or Kruskal–Wallis for interval or continuous variables that were non-Gaussian (e.g., offender possession at the SAP levels) or one-way analysis of variance (ANOVA) for interval or continuous type data that were Gaussian (e.g., contact offence level with possession at the SAP levels). For effect size statistics, Cohen's d was presented for continuous/ordinal variables by groups with the dual offender group used as the referent category.[1] Odds ratios (OR)[2] were used for dichotomous variables by groups, r's for ranked variables by group and Cramer's V for variables with more than 2 × 2 column. Bonferonni corrections resulted in an adjusted p value of .0167 to allow for the multiple comparisons.

Results

Socio-demographic characteristics

Table III indicates the socio-demographic characteristics for dual and non-contact offenders. Overall, IIOC offenders ages ranged from 18 to 75 years with the mean age being 42.37 years (SD = 12.52, median = 41). Independent *t*-tests found no significant effect regarding the age of offenders at IIOC arrest, with both groups aged around 42 years.

The results indicated that dual offenders were significantly more likely to live with any children (e.g., own children; partners children), $\chi^2(1) = 8.841$, $p < .01$. Based on OR, dual offenders were 2.34 times more likely (95% CI = 1.33–4.13) than non-contact offenders to live with children. In addition, dual offenders were 11.48 times more likely (95% CI = 2.61–50.45) than non-contact offenders to live with a partner and their partners' children. Of those IIOC offenders who lived with a partner and their partners' children, 90.5% were identified as dual offenders and 9.5% as non-contact offenders, $\chi^2(1) = 15.678$, $p < .001$. All other living arrangements were non-significant ($p > .05$).

Table III. *Comparative socio-demographic characteristics of dual and non-contact offenders*

	Full sample (n = 244)		
Age at arrest	All offenders (n = 244) Mean = 42.4, SD = 12.5	Dual offenders (n = 120) Mean = 42.0, SD = 12.6	Non-contact (n = 124) Mean = 42.7, SD = 12.5
Living arrangements			
On own	83 (35.6%)	37 (32.5%)	46 (38.7%)
Parents	34 (14.6%)	13 (11.4%)	21 (17.6%)
Individual not partner	12 (5.2%)	6 (5.3%)	6 (5.0%)
Partner	32 (13.7%)	12 (10.5%)	20 (16.8%)
Partner and children**	72 (29.5%)	46 (38.3%)	26 (21.0%)
Partner and own children	51 (21.9%)	27 (23.7%)	24 (20.2%)
Partner and her children***	21 (9.0%)	19 (16.7%)	2 (1.7%)
Access to children			
Any access***	161 (66.0%)	96 (80.0%)	65 (52.4%)
Has children*	90 (36.9%)	53 (44.2%)	37 (29.8%)
Job access	35 (14.3%)	16 (13.3%)	19 (15.3%)
Family access**	91 (37.3%)	57 (47.5%)	34 (27.4%)
Other access	43 (17.6%)	34 (28.3%)	9 (7.3%)
Relationship status			
Single	102 (42.9%)	44 (37.6%)	58 (56.9%)
Separated	23 (9.7%)	12 (10.3%)	11 (9.1%)
Co-habiting (partner)	31 (13.0%)	15 (12.8%)	16 (13.2%)
Married	82 (34.5%)	46 (39.3%)	36 (29.8%)
Previous convictions			
Any previous ***	94 (38.5%)	62 (51.7%)	32 (25.8%)
Image offences	25 (10.2%)	9 (7.5%)	16 (12.9%)
Other sexual offences	12 (4.9%)	8 (6.7%)	4 (3.2%)
Violent offences*	18 (7.4%)	13 (10.8%)	5 (4.0%)
Other non-sexual ***	56 (23.0%)	39 (32.5%)	17 (13.7%)
Drink/drug related offences	18 (7.4%)	12 (10.0%)	6 (4.8%)
Three or more convictions**	37 (15.2%)	27 (22.5%)	10 (8.1%)
Served time in prison	29 (13.2%)	19 (17.8%)	10 (8.9%)

*$p < .05$, **$p < .01$, ***$p < .001$.

Dual offenders were significantly more likely to have any type of access to children, $\chi^2(1) = 20.668$, $p < .001$. Using OR, they were 3.63 times more likely (95% CI = 2.05–6.42) than non-contact offenders to have access to children. Dual offenders also had significantly higher frequencies than non-contact offenders when exploring access through their own children (regardless of whether they lived with them or not), $\chi^2(1) = 5.378$, $p < .05$, OR = 1.86, 95% CI = 1.10–3.15; access through their family, $\chi^2(1) = 10.515$, $p < .01$, OR = 2.40, 95% CI = 1.41–4.08; with the highest odds ratio (OR = 5.05) for access to children via other means, for example, volunteering for a club and befriending a neighbourhood child, $\chi^2(1) = 18.658$, $p < .001$, 95% CI = 2.30–11.09. Access through employment was non-significant ($p > .05$).

There were no differences ($p > .05$) between the offender groups when examining their relationship status dichotomously (single/separated versus cohabiting/married; $p > .05$) or when exploring the factors separately.

Dual offenders were also significantly more likely to have any previous convictions, $\chi^2(1) = 17.220$, $p < .001$, OR = 3.07, 95% CI = 1.79–5.27. Chi-square analysis indicated that dual offenders had significantly more violent convictions, $\chi^2(1) = 4.128$, $p < .05$, OR = 2.89, 95% CI = 1.00–8.38; non-violent/non-sexual convictions, $\chi^2(1) = 12.176$, $p < .001$, OR = 3.03, 95% CI = 1.60–5.74, and those convicted on three or more separate convictions, with each conviction imposing a possible community or custodial sentence, $\chi^2(1) = 9.878$, $p < .01$, OR = 3.31, 95% CI = 1.52–7.19. Previous convictions for the other type of offences were non-significant ($p > .05$).

Internet activity

Producers and grooming behaviour. Comparisons between dual and non-contact offenders revealed a highly significant difference in the production[3] of IIOC, $\chi^2(1) = 46.305$, $p < .001$. OR indicated that the dual offender group was 7.11 times more likely to be engaging in production of IIOC (95% CI = 3.92, 12.87). When exploring the differing types of IIOC production analysis, four cells had an expected count less than 5, so an exact significance test was selected for Pearson's chi-square, $\chi^2(3) = 35.856$, exact $p = .001$, Cramer's $V = .624$. Dual offenders were more likely to engage in hands-on production ($n = 53$) compared to non-contact ($n = 3$), whereas non-contact recorded a higher frequency of webcam use ($n = 11$) than dual offenders ($n = 4$).

Of the 244 IIOC offenders, 122 (50%) were recorded as engaging in the sexual grooming of a child and only 17 offenders (14%) had been convicted of sexual grooming. Dual offenders were significantly more likely to be engaging in grooming behaviours, $\chi^2(1) = 75.824$, $p < .001$, with the OR indicating this group to be 12.40 times more likely than the non-contact offender group (95% CI = 6.77, 22.70). Regarding the type of grooming behaviours displayed by offenders, these were grouped into three categories: (1) online, (2) offline and (3) both online and offline grooming. Dual offenders had a higher proportion of offline groomers ($n = 55$, 93.2%) compared to non-contact offenders ($n = 4$, 6.8%). Conversely, non-contact offenders had a higher proportion of online groomers ($n = 21$, 56.8%) compared to dual offenders ($n = 16$, 43.2%). Analysis revealed a significant difference between the offender groups, $\chi^2(2) = 34.552$, $p < .001$, Cramer's $V = .532$. Those who engaged in both online and offline grooming produced the biggest differential between the groups. For dual offenders, 88.5% ($n = 26$) engaged in both online and offline grooming compared to 11.5% ($n = 3$) of non-contact offenders.

Other Internet activities

Significant chi-square results were found indicating that dual offenders were less likely to pay for access to IIOC, $\chi^2(1) = 3.905$, $p < .05$, OR = 2.61, 95% CI = .98, 6.98, and destroy IIOC (e.g., deleted), $\chi^2(1) = 10.409$, $p < .01$, OR = 2.68, 95% CI = 1.46, 4.93. Other variables were not significant (see Table IV).

Response in interview

Offenders' responses in interview were recorded for 225 offenders. A significant difference was found, $\chi^2(3) = 14.042$, $p < .01$, Cramer's $V = .250$. Table IV indicates that dual offenders were more likely to give a no comment interview and deny the offence(s), whereas non-contact offenders recorded higher frequencies for partial and full admissions.

Quantity and type of IIOC possessed

Quantity of IIOC possessed. The total number of IIOC possessed per offender ranged from 2 to 202,500, with a median of 423.50 ($M = 7782.98$, SD = 25,140.14). For still-only IIOC, this ranged from 0 to 196,387 ($M = 7135.46$, SD = 22,063.35) with a median of 405. Movie-only image possession ranged from 0 to 9007 ($M = 218.08$, SD = 873.19) with a median of 7.5. When examining possession, an average of 74.81% of IIOC was in a still format and 10.80% in a movie format.

The number of IIOC possessed varied greatly for offender groups and in most cases were significantly positively skewed, with many cases grouped around the lower end of the scale. Despite using non-parametric comparisons (Mann–Whitney U analysis), non-transformed data are presented throughout.

The difference between type of offender and number of IIOC possessed. A significant effect was found when examining the grand total of IIOC possessed, $U = 6068.0$, $Z = -2.293$, $p < .05$, $d = -0.25$, 95% CI = −1.01−0.02, with dual offenders possessing significantly less IIOC ($M = 4605.11$, SD = 12,511.18) than non-contact offenders ($M = 10,807.08$, SD = 32,719.40). This was also found for movie IIOC, $U = 4300.5$, $Z = -2.436$, $p < .05$, $d = -0.19$ (dual offenders possessing significantly less $M = 124.55$, SD = 510.72; non-contact offenders $M = 292.26$, SD = 1074. 0). This difference was not found for still IIOC possessed ($p > .05$).

Table IV. *Categories and frequencies regarding other Internet activity for dual and non-contact offenders*

Other offending behaviours	All offenders ($n = 244$)	Dual offenders ($n = 120$)	Non-contact offenders ($n = 124$)
Paid for access to IIOC*	21 (8.6%)	6 (5.0%)	15 (12.1%)
Possess adult pornography	132 (74.6%)	60 (71.4%)	72 (77.4%)
Distribute IIOC	69 (28.4%)	35 (29.4%)	34 (27.4%)
Password protected IIOC	53 (28.3%)	23 (27.7%)	30 (28.8%)
Destroy IIOC**	150 (70.4%)	59 (59.6%)	91 (79.8%)
*Response in interview****			
No comment	61 (27.1%)	38 (34.5%)	23 (20.0%)
Denied offences	38 (16.9%)	24 (21.8%)	14 (12.2%)
Partial admission	29 (12.9%)	13 (11.8%)	16 (13.9%)
Full admission	97 (43.1%)	35 (31.8%)	62 (53.9%)

*$p < .05$, **$p < .01$, ***$p < .001$.

The difference between type of offender and SAP level of IIOC possessed. Non-parametric group comparisons explored the differences regarding the number of IIOC (combined still and movie) at each of the SAP levels, except for Level 5: Level 1 IIOC: $U = 5141.5$, $Z = -2.740$, $p < .01$, $d = -0.27$; Level 2 IIOC: $U = 5534.5$, $Z = -2.068$, $p < .05$, $d = -0.14$; Level 3 IIOC: $U = 5498.5$, $Z = -2.140$, $p < .05$, $d = -0.18$; and Level 4 IIOC: $U = 5415.0$, $Z = -2.411$, $p < .01$, $d = -0.21$ (see Table V). As the results show, dual offenders had significantly less total IIOC at all SAP levels.

As dual offenders were found to have less IIOC in total (still and movie) across the five SAP levels than dual offenders, the amount offenders possessed was calculated as a percentage to explore offenders' possession across the five levels. A significant effect was found when exploring the proportion of IIOC possessed at Level 1: $U = 7651.0$, $Z = -2.153$, $p < .05$, $d = -0.28$. As indicated in Table V, non-contact offenders averaged 64.09% of Level 1 IIOC (SD = 28.69) compared to 54.90% (SD = 36.23) for dual offenders. All other SAP levels produced non-significant effects ($p > .05$).

Table V. *Comparative IIOC possession of non-contact and dual offenders*

	Dual offenders ($n = 120$) Mean/SD	Non-contact ($n = 124$) Mean/SD	Cohen's *d*
Total IIOC*	4605.11/12511.18	10807.08/32719.40	−.25
Total of all Level 1***	1994.41/4720.92	5694.12/18137.90	−.27
Total of all Level 2*	241.66/747.43	448.84/1922.74	−.14
Total of all Level 3*	220.27/670.96	372.19/972.13	−.18
Total of all Level 4*	233.33/635.08	398.69/907.34	−.21
Total of all Level 5	26.44/78.99	42.05/635.08	−.03
Percent of all Level 1*	54.90/36.23	64.09/28.69	−.28
Percent of all Level 2	9.94/13.84	8.92/10.11	.08
Percent of all Level 3	8.57/10.96	8.35/7.49	.02
Percent of all Level 4	16.52/22.69	16.25/16.36	.10
Percent of all Level 5	2.79/6.92	2.46/9.23	.04
Total of still images	3969.05/9504.55	9684.69/28191.78	−.27
Total of movies*	124.55/510.72	292.26/1074.00	−.19
Total of still Level 1**	1774.74/4139.32	5922.97/18507.21	−.29
Total of still Level 2	253.10/763.52	445.42/1907.75	−.13
Total of still Level 3	239.69/711.58	371.41/953.68	−.16
Total of still Level 4	235.67/637.42	309.92/724.13	−.11
Total of still Level 5	29.78/84.33	38.95/101.77	−.10
Percent of still Level 1*	54.81/35.98	67.95/28.51	−.41
Percent of still Level 2	10.24/14.44	6.86/10.66	.27
Percent of still Level 3	10.38/12.91	8.05/8.82	.21
Percent of still Level 4	13.00/19.33	8.93/10.29	.26
Percent of still Level 5	2.00/6.50	.99/2.30	.21
Total of movies Level 1**	23.69/80.62	88.49/385.01	−.22
Total of movies Level 2**	24.71/80.64	32.84/98.51	−.09
Total of movies Level 3**	5.38/14.21	19.05/92.14	−.20
Total of movies Level 4**	27.86/66.20	51.85/137.72	−.21
Total of movies Level 5*	1.94/4.11	5.92/18.13	−.29
Percent of movie Level 1**	12.92/26.88	21.31/29.99	−.30
Percent of movie Level 2*	13.03/20.97	16.00/19.53	−.15
Percent of movie Level 3*	7.04/13.47	9.08/13.53	−.15
Percent of movie Level 4	29.30/33.76	36.53/30.72	−.22
Percent of movie Level 5	6.07/14.52	4.58/11.22	.11

*$p < .05$, **$p < .01$, ***$p < .001$.

As there were differences found between the number of IIOC and proportion of IIOC at the SAP level 1, still and movie were examined separately to explore whether the format of the IIOC further differentiated the offender groups.

On average, 74.81% of images possessed were in a still format. Dual offenders were found to possess significantly smaller quantities of Level 1 still IIOC, $U = 4128.5$, $Z = -2.776$, $p < .01$, $d = -0.29$, and significantly lower proportion of Level 1 still IIOC ($M = 54.81$, SD = 35.98) compared to non-contact offenders ($M = 67.95$, SD = 28.51), $U = 5121.00$, $Z = -2.248$, $p < .05$, $d = -0.41$. All other comparisons were non-significant ($p > .05$).

On average, 10.80% of IIOC possessed were movies. Non-parametric group comparisons revealed that dual offenders possessed significantly less quantities of movie IIOC at each of the SAP levels when compared to non-contact offenders (Level 1: $U = 2821.5$, $Z = -3.282$, $p < .001$, $d = -0.22$; Level 2: $U = 2899.5$, $Z = -3.012$, $p < .01$, $d = -0.09$; Level 3: $U = 3045.0$ $Z = -2.606$, $p < .01$, $d = -0.20$; Level 4: $U = 2970.5$, $Z = -2.755$, $p < .01$, $d = -0.21$; and Level 5: $U = 3268.0$, $Z = -1.966$, $p < .05$, $d = -0.29$). Cohen's d resulted in small to medium effect sizes.

The total number of movies possessed was also measured as a percentage across the five levels. Table V highlights that dual offenders possessed a lower proportion of movie IIOC at all SAP levels, except Level 5. The results revealed a significant, small-sized effect for Level 1 IIOC in a movie format, $U = 3196.0$, $Z = -3.457$, $p < .001$, $d = -0.30$, Level 2 IIOC movies: $U = 3196.5$, $Z = -2.106$, $p < .05$, $d = -0.15$ and Level 3 movies: $U = 3239.0$, $Z = -2.004$, $p < .05$, $d = -0.15$. No significant different was found for Level 4 or 5.

Extreme pornography

It was recorded that 50 IIOC offenders also possessed extreme images, of which 72.0% were identified as non-contact offenders, whereas only 28.0% were dual offenders. This difference was significant, $\chi^2(1) = 8.85$, $p < .01$, OR = .35, 95% CI = .17, .71.

Types of indecent images possessed by offenders

From the 202 offenders where the IIOC gender preference was indicated, 128 (63.4%) were females being depicted. Just under a quarter were both male and female ($n = 47$, 23.3%) with only 13.4% ($n = 27$) male-only IIOC. No significant differences were found between the offender groups, $\chi^2(2) = 3.633$, $p > .05$, with regard to gender or the average age of the child depicted within the IIOC.

When the average age range of the children within the images was assessed, a significant difference was found, $t(183) = 2.999$, $p < .01$, with a medium effect size, $d = .41$. Dual offenders possessed IIOC of children within a smaller age range ($M = 6.53$, SD = 3.78) in comparison to non-contact offenders ($M = 8.10$, $SD = 3.31$).

Discussion

This paper sought to examine differences between dual and non-contact IIOC offenders in terms of their socio-demographic characteristics, Internet behaviours, and quantity and type of IIOC in their possession. Significant differences were found within all the three themes.

Factors associated with contact child sexual abuse

Whilst all three areas explored provided notable discriminatory power between the offender groups, the cumulative picture produced indicates key interlinked risk factors in identifying those offenders most at risk of contact abusing children.

A key factor that emerged from the results was access to children. Although both groups of offenders recorded the highest frequency for living on their own, comparative analysis identified that dual offenders were most likely to have access to children, whether this be through their relationships (partner), living arrangements, own family or access within their neighbourhood. Importantly, this may allow the offender to have unsupervised access to children, which may in some circumstances facilitate sexual abuse. Previous research has reported that dual offenders seem to have an increased ability in identifying vulnerable victims (Craven et al., 2006) and engaging in trusting relationships with adults and children (Seto et al., 2011; Webb et al., 2007). They often use their grooming techniques to gain the trust of their local community (van Dam, 2001), dedicating a substantial amount of time building relationships with individuals, specifically targeting single parents (Elliott, Browne, & Kilcoyne, 1995; Long et al., 2013) to exploit them for sexual gain (Craven et al., 2006).

The other key discriminator between dual and non-contact IIOC offenders was previous offending history. Around 16% of dual offenders in the sample had a previous contact child sexual offence. This figure is similar to the recent meta-analysis of IIOC offenders which concluded that on average 12% of IIOC offenders had a previous contact history, when using conviction data (Seto et al., 2011). In addition, the results of this paper support much previous research regarding the increased risk of atypical sexual interests (e.g., possession of IIOC) in conjunction with anti-social cognitions (e.g., previous criminal history; Seto, 2013), as the group that displayed both of these behaviours was dual offenders. Dual offenders were significantly more likely to have previous convictions and these could be seen as enduring anti-social cognitions, with this offender group significantly more likely to be convicted on three or more separate occasions. In addition, they also had previous convictions for violent offences and other (non-violent, non-sexual) offences. Furthermore, dual offenders seemed to be more criminally aware, potentially linked to their previous offending history and dealings with the criminal justice system. There were less likely to pay for access to IIOC and also more likely to give a no comment interview compared to non-contact offenders.

Conversely, non-contact offenders within this study were more likely to be living with parents and to be single, similar to previous research (Elliott et al., 2013). This may indicate the potential social deficits these non-contact offenders may have when engaging in the outside world (Middleton, Elliott, Mandeville-Norden, & Beech, 2006; Putnam, 2000; Quayle & Taylor, 2002; Quayle, Vaughan, & Taylor, 2006). This could also be explained by non-contact offenders having a "passive viewer" attitude regarding their offending behaviour (Elliott et al., 2009). Previous research has noted that IIOC offenders often reconstruct their crime to a "simple possession", thus ensuring that they differentiate themselves from those who actually engage in the sexual abuse of children (Elliott & Beech, 2009).

The average level of IIOC possessed for the 244 IIOC offenders was 1.85. This indicates that the majority of offenders' IIOC possession depicts "a child erotically posing with no sexually activity" (SAP Level 1) to "non-penetrative sexual activity between children, or solo masturbation by a child" (SAP Level 2). Moreover, when examining image content, the only factor that distinguished dual offenders from non-contact was the average age range of the children depicted. Dual offenders possessed images of children within a smaller age range. This could support the anchoring preferences of dual offenders (Long et al., 2013) with

previous research suggesting that individuals seek out material which is most arousing to them and reflects their sexual fantasies (Glasgow, 2010; Howitt, 1995; Seto et al., 2001). Their IIOC possession may relate to their sexually assaultive behaviour (Burgess, Hartman, Ressler, Douglas, & McCormack, 1986). This explanation could also be applied to the non-contact offenders' possession. As their collections included a wider range of victim ages, at SAP Levels 1 and 2, this may reflect their sexual fantasies: the sexual depiction of children but with no adults involved in the abuse of children. Alternatively, as non-contact offenders generally possessed more IIOC than dual, this may inevitably allow for a wider set of victim ages, with preference for those images in highest circulation (Levels 1 and 2). As non-contact offenders were also most likely to possess extreme pornography, this may indicate a higher preference for engagement with a range of sexually explicit material online (Morahan-Martin & Schumacher, 2000; Quayle et al., 2006).

Limitations and future research

This paper used a stratified random sample of IIOC offenders, identified and grouped on the basis of their index offence. Therefore, it is likely there were undetected contact offenders within the non-contact group, consistent with Bourke and Hernandez (2009). In addition, within the coding of the offending groups, undetected offences may exist, for example, IIOC-only offenders may have included undetected grooming offenders, and sexual touching offenders may have committed more serious undetected offences.

As the information used for this paper was originally gathered for prosecution and investigatory purposes rather than for use in this study, every effort was made to verify data using a variety of means (e.g., offender, victim interviews, discussions with investigators and full case files). In addition, this research did not gather temporal information on offender's behaviour. Consequently, any findings regarding the time spent downloading IIOC were based upon the offender's admission in interview at the time of arrest and any available computer analysis information.

Regarding the function of the image, it is unknown exactly how the images are used: they may be used to escalate to contact sexual offending (Buschman, Wilcox, Oelricj & Quayle & Taylor, 2010; Sheehan & Sullivan, 2010) or offenders already had an established paedophilic sexual interest (Bourke & Hernandez, 2009). Therefore, it is recommended that future research interview offenders to establish increased understanding regarding the function the images has for each of the offender groups and its role in their sexual behaviours. Finally, as many of the analyses focused on the SAP levels (SGC, 2007) possessed by the offenders, caution should be used when interpreting these results as these are based on the UK sentencing framework (Sentencing Guidelines Council, 2007). Further work should be undertaken to establish whether similar patterns within an offenders IIOC possession exist internationally.

Conclusions

This paper examined the differences between dual and non-contact offenders in their socio-demographic, characteristics Internet activities, and quantity and type of IIOC possessed. This study found that many of the variables associated with contact sexual abuse identified within this paper are factors available to law enforcement agencies at an intelligence development stage of an investigation. Key factors associated with dual offending were: access to children (own, family and other access), living arrangements (with partner and children, specifically not their biological children), previous offence history (violent, other

non-violent/non-sexual and more than three separate convictions), sexual grooming, particularly offline and production of IIOC, possession of IIOC that depict victims within a six years age range. In contrast, non-contact offenders were identified as living with their parents, paying for access to IIOC, deleting their images regularly, possessing a higher proportion of Level 1 (combined, still and movie) and Levels 2 and 3 (movie) IIOC and admitting their offending behaviour in police interview. These findings further support the exploratory findings of Long et al. (2013), which posited a possible homology between Internet offending behaviours and sexually assaultive behaviour offline. This theory suggests that IIOC offenders engage in Internet behaviours and seek IIOC which reflect their sexual fantasy (Long et al., 2013; Seto et al., 2001). Other research supports this notion that individuals seek out material which is most arousing to them, reflecting their sexual fantasies (Glasgow, 2010; Howitt, 1995; Seto et al., 2001). These discriminatory factors could assist with investigative prioritisation by identifying those offenders most at risk of committing sexual abuse against children, however, they may not be the same factors as those which predict which IIOC offenders might commit contact offences in the future.

Notes

1. Cohen (1988) defined a small effect size as $d = .20$, a medium effect size as $d = .50$ and a large effect size as $d = .80$.
2. 95% confidence intervals are also provided for all odds ratio's with many indicating a broad range of values suggesting low precision.
3. Production of IIOC can include various offences: taking (s.1. Protection of Children Act, 1978) voyeurism (s.67 Sexual Offences Act, 2003).

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