

Developing a Typology of Child Sexual Exploitation Material Offending in New Zealand

By

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Abstract

Existing typologies of child sexual exploitation material (CSEM) offending are significantly limited as many have not been empirically developed or tested for their validity or reliability. Furthermore, their practical utility is limited, as many typologies classify individuals based only on the type of CSEM offending they engage in or are limited to a small number of variables. The current research addresses these issues by developing an exploratory typology of individuals who have engaged in CSEM offending using a data set of 557 individuals in New Zealand, who have been identified by the Department of Internal Affairs. A latent class analysis was conducted using their offence characteristics to identify distinct subgroups within the sample. Follow-up tests were conducted to evaluate how these groups differed on various individual characteristics to develop a more detailed understanding of the individuals within each group. Results found four distinct subgroups of individuals who varied according to their level of engagement with the material, technical capability, type of CSEM offending, and the type of material they searched for. Post-hoc tests also revealed significant differences in access to children, previous sexual offending, and previous CSEM offending between groups. Implications for practice and future research are discussed.

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Table of Contents

Abstract	iii
Acknowledgements	v
Table of Contents	vii
List of Figures	xi
List of Tables	xiii
List of Appendices.....	xv
Introduction	1
Nature of Material.....	3
Characteristics of Individuals Engaging in CSEM Offending.....	4
Demographic characteristics.....	5
Offending history.....	6
Psychological characteristics.....	7
Offence-related characteristics.....	8
Summary.....	10
Risk of Recidivism.....	10
Theory.....	12
Typologies of Individuals Engaging in CSEM Offending.....	15
Typologies of offence type.....	16
Typologies of offence characteristics.....	18

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Typologies of psychological characteristics.....	22
Typologies of motivations.....	23
Summary of typologies.....	27
Study Objectives.....	28
Method.....	30
Participants.....	30
Procedure.....	30
Study Variables.....	31
Excluded variables.....	31
Indicator variables.....	32
External variables.....	35
Statistical analysis.....	36
Results.....	39
Descriptive Statistics.....	39
Results of the Latent Class Analysis.....	40
Description of Classes.....	41
Class Differences on Indicator Variables.....	46
Class Differences on External Variables.....	51
Discussion.....	54
Summary of Results.....	54

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

LLU group results.....	54
GSD group results.....	55
MLC group results.....	56
HLC group results.....	57
Interpretation of the Results.....	58
Comparisons with Previous Typologies.....	62
Mapping the Typology onto the Problematic Internet Use Model.....	66
Implications.....	68
Limitations.....	70
Future Research.....	71
Conclusion.....	73
References.....	75
Appendices.....	88
Appendix A: Summary of Typologies.....	88
Appendix B: Search Terms Coding Sheet.....	91

List of Figures

<i>Figure 1.</i> Probability of engagement levels occurring for each class.....	44
<i>Figure 2.</i> Probability of technical capability levels occurring for each class.....	44
<i>Figure 3.</i> Probability of dichotomous offence variables occurring for each class.....	45

List of Tables

Table 1. <i>Descriptive results for external variables</i>	39
Table 2. <i>Descriptive results for indicator variables</i>	40
Table 3. <i>Model fit statistics and class sizes of latent class analysis</i>	41
Table 4. <i>Chi square test results for dichotomous indicator variables</i>	49
Table 5. <i>Frequencies of engagement and technical capability ratings by class</i>	50
Table 6. <i>Mann-Whitney U test results for engagement and technical capability</i>	50
Table 7. <i>Chi square test results for external individual variables</i>	53

List of Appendices

Appendix A: Summary of Typologies	88
Appendix B: Search Terms Coding Sheet.....	91

Developing a Typology of Child Sexual Exploitation Material Offending in New Zealand

With more than four billion Internet users as of 30 June 2018 (Internet World Stats, 2018), the increased prevalence of child sexual exploitation material (CSEM) offending has created a significant challenge for academics, law enforcement, and clinicians. Definitions of CSEM vary across jurisdictions and professions, meaning no one universal definition exists (Gillespie, 2010). In New Zealand, CSEM is prohibited under the Films, Videos, and Publications Classifications Act 1993. A publication is deemed objectionable if it “promotes or supports, or tends to promote or support...the exploitation of children, or young persons, or both, for sexual purposes”. Consideration is given to the extent and degree to which the publication “describes, depicts, or otherwise deals with...sexual conduct with or by children, or young persons, or both” and “exploits the nudity of children, or young persons, or both”. New Zealand law includes real, virtual, and textual material of children under the age of 18 and CSEM offences include its production, possession, distribution, and importation. As the current study is conducted in a New Zealand context, the New Zealand legal definition of CSEM will be adopted.

CSEM offending has existed long before the Internet (Wortley & Smallbone, 2012). However, once the Internet was introduced, it increased exponentially (Wortley & Smallbone, 2012). This increase can be partially explained by Cooper’s (2002) Triple-A-Engine: affordability, anonymity, and accessibility. More specifically, the Internet has facilitated an increase in CSEM offending because it has made CSEM more widely accessible and cheaper, whilst providing a sense of anonymity (Cooper, 2002). Estimating the true extent of CSEM offending is extremely difficult, if not impossible, due to the large number of websites on the Internet and because individuals who engage in CSEM offending use increasingly sophisticated methods to hide their offending, such as strong encryption,

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

peer-to-peer networking, and the Dark Web (Eggestein & Knapp, 2014; End Child Prostitution and Trafficking International, 2018; Taylor & Quayle, 2003). Put simply, the Dark Web can be defined as a section of the Internet that is unable to be accessed using standard web browsers, and instead requires specific software which allows users to remain largely anonymous (Bertram, 2015).

Nonetheless, current estimates suggest that CSEM offending is increasing at a significant rate. From 2001 to 2009, arrest rates for CSEM tripled in the United States (Wolak, Finkelhor, & Mitchell, 2011). Furthermore, the Internet Watch Foundation (2016) reported a 417% increase in reports of CSEM between 2013 to 2015, whilst the Canadian Centre for Child Protection (2016) processed over 37,000 reports in 2015 compared to just under 8,000 in 2008, with nearly 96% of these reports pertaining to CSEM. It is important to note that these reported increases in CSEM offending may be due to either a true increase in this behaviour, especially as over time more individuals are gaining Internet access, or due to the increased public awareness of online child sexual exploitation which has resulted in increased proactive policing, therefore contributing to the increasing number of individuals arrested every year (Wolak, Finkelhor, Mitchell, & Jones, 2011). The observed increase in CSEM offending is likely explained by both reasons, however, the increase itself highlights the importance of this issue and the need to develop an understanding of this type of offending.

Given the importance of this area of research and the significant impact the creation and perpetuation of this material has on its victims, CSEM literature has gained significant traction in the last two decades. The research has focussed on several key areas in order to develop an understanding of this group of individuals. These areas include the nature of the material they possess, their individual and offence characteristics, their level of risk, and theories of the aetiology of their offending. As such, this section will review these key areas

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

in order to provide an overview of the current literature. It will then evaluate research pertaining to the typologies of CSEM offending. Existing CSEM typologies and their strengths and weaknesses will then be discussed. Finally, this section will summarise the main limitations of the CSEM typology literature and will identify objectives of the current study to address these limitations.

Nature of Material

The format and content of CSEM is often investigated as it provides an insight into how the material is accessed and provides an indication of the sexual interests of the individual. Now that the Internet is widely accessible, CSEM is almost exclusively in a digital format (Seto, 2013). A study by Merdian (2012) found that digital images are the most common format, followed by videos and text files, with non-digital material being less common. However, this study found that individuals engaging in CSEM offending often possess material in at least two different formats. Merdian also found that individuals most commonly accessed material from websites, followed by file exchange systems and online newsgroups. Other methods of accessing CSEM include the Dark Web, chatrooms, e-mail, and webcams (Garrington, Chamberlain, Rickwood, & Boer, 2018). Use of live stream is also becoming more frequent and is often used as an alternative to child sexual tourism, as the direct contact involved in traditional child sexual tourism has become increasingly risky due to increased likelihood of detection (Anti-Slavery Australia, 2017).

Research shows that CSEM most commonly depicts prepubescent girls (Bunzeluk, 2009; Carr, 2004; Internet Watch Foundation, 2016; Steel, 2009; Wolak, Finkelhor, & Mitchell, 2005; Wolak et al., 2011). Additionally, victims tend to be of Caucasian or Asian ethnicity (Baartz, 2008; Carr, 2004; Taylor, Quayle, & Holland, 2001; Taylor & Quayle, 2003). In terms of the sexual activity depicted in CSEM, Wolak et al., (2005) found that 80% of individuals in their sample possessed CSEM depicting sexual penetration and

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

approximately one in five (21%) possessed images of sexual violence such as bondage and torture. A similar trend was shown in a study by Eke and Seto (2012) who found that 20% of individuals in their study possessed content where the child was distressed, bound, or physically abused. However, research regarding the changes in the sexual activity depicted in CSEM over time is mixed. Seto, Buckman, Dwyer, and Quayle (2018) reported that the content of CSEM became more extreme between 2002 and 2014, whilst the Internet Watch Foundation reported a decrease in material depicting rape or sexual torture and an increase in non-penetrative activity between 2012 and 2015. Interestingly, according to Taylor and Quayle (2003), children are often smiling in photographs and are rarely shown to be in distress, suggesting that only a minority of individuals are interested in viewing more extreme material.

Overall, individuals tend to show a preference for prepubescent girls and have material in a digital format that depicts sexual penetration, whilst only a minority of individuals possess extreme material (e.g., torture). However, Glasgow (2010) states that the nature of the material is not as important as the individual's level of engagement with the material, as individuals engaging in CSEM offending often have large collections that have been downloaded all at once. This means that individuals may not be fully aware of the exact nature of the material that they have downloaded and therefore may not necessarily be interested in it. Instead, Glasgow suggests reviewing their digital activity in terms of which images are repeatedly accessed, replicated, and moved within the collection reflects a higher engagement with the material, thus being more indicative of a sexual interest in the content of that material.

Characteristics of Individuals Engaging in CSEM Offending

The majority of CSEM research has focussed on analysing the characteristics of individuals who engage in CSEM offending to identify whether they are a unique subgroup

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

who require alternative assessment and treatment approaches. These studies are often impacted by selection effects as samples are typically composed of individuals who have been detected by authorities. This is important because there may be meaningful differences between detected and undetected individuals that are not captured by these studies. These potential differences are discussed by Seto (2013), who states that detected individuals may be more impulsive and careless than undetected individuals, meaning they might not take adequate precautions to hide their offending, thus increasing their comparative likelihood of detection. Similarly, he suggests that detected individuals may be more sexually compulsive as people who are able to control their urges may engage in less CSEM offending and are therefore less likely to be detected. Further issues arise when considering the make up of individuals charged with CSEM offending. That is, research has suggested that individuals who possess material of prepubescent children are more likely to be arrested and prosecuted than those possessing material of underage adolescent children, as material of prepubescent children is easier to accurately identify as CSEM (Seto, 2013). Finally, studies adopt different inclusion criteria for their samples (i.e., some evaluate only those engaging in CSEM offending, whilst others also include those who have engaged in other types of Internet sexual offending, such as solicitation). Therefore, this research may not accurately capture the characteristics of those engaging in CSEM offending. With these limitations in mind, an overview of their demographic, psychological, and offence characteristics is presented below.

Demographic characteristics. Individuals who engage in CSEM offending are a heterogeneous group, however, research suggests they share several commonalities. Firstly, they are generally male, Caucasian, and in their late 30s to early 40s. (Bourke & Hernandez, 2009; Faust, Bickart, Renaud, & Camp, 2014; Merdian, Wilson, & Boer, 2009; Motivans & Kyckelhahn, 2007; Wolak et al., 2011). They also tend to be younger and less likely to be of an ethnic minority than those who engage in contact sexual offending (CSO, mostly against

children; Babchishin, Hanson, & Hermann, 2011; Babchishin, Hanson, & VanZuylen, 2015).

This age difference could be either because younger individuals possess better computer skills and therefore the age gap can be expected to close over time (Merdian, 2012; Seto, 2013), or it is the result of sampling issues with a prison population, as those who engage in CSO generally receive longer sentences and have their computer access monitored upon release, thereby reducing their likelihood of engaging in CSEM due to increased likelihood of detection (Merdian, 2012).

Further, most individuals who engage in CSEM offending are single and are more likely to be single than those who engage in CSO or the general population (Aslan & Edelmann, 2014; Babchishin et al., 2011, McManus, Long, Alison, & Almond, 2015). Individuals who engage in CSEM offending also tend to have higher levels of education, employment, and income than those who engage in CSO, but are more likely to be unemployed than the general population (Babchishin et al., 2015; Bates & Metcalf, 2007; Faust et al., 2014; Howitt & Sheldon, 2007). Henshaw, Ogloff, and Clough (2017) point out that the demographic characteristics of individuals who engage in CSEM offending conflict with what is known about the general offending population, who, for various reasons, are often of an ethnic minority group with limited levels of education. These differences may be related to the fact that Internet use is higher in individuals who are young, male, Caucasian, and have a high income and an education (Zickuhr & Smith, 2012). Therefore, computer and Internet access and literacy may mediate at least some of these findings (Merdian, 2012).

Offending history. Research suggests that most individuals who engage in CSEM offending do not have a recorded offending history. Eke, Seto, and Williams (2011) found that 53% of individuals who had engaged in CSEM offending in their study had no recorded offending history. Additionally, Elliot, Beech, Mandeville-Norden, and Hayes (2009) found that in their sample of 494 individuals who had engaged in Internet sexual offending, 89.1%

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

had no recorded offending history, compared to just over 76.2% for those who had engaged in CSO ($n = 520$). While the discrepancy between these two findings (53% and 89%) is large, it does indicate that at least half of those who have engaged in CSEM offending have no offending history and fewer prior offences than those engaging in CSO. However, previous offending records may not be an accurate indicator of previous offending, as a meta-analysis by Seto, Hanson, and Babchishin (2011) found that 12% of individuals engaging in Internet sexual offending (mostly CSEM) had previous recorded contact sexual offences, but this number increased to 55% when using self-report data. These studies indicate that individuals who engage in CSEM offending and CSO (mixed offending) may be more common than indicated by official statistics. However, a significant subset of those who engage in CSEM offending do not engage in CSO.

Psychological characteristics. The psychological characteristics of those who engage in CSEM offending are often evaluated in comparison to those who engage in CSO or mixed offending, to evaluate whether they are meaningfully different groups. Research suggests that those who engage in CSEM offending differ significantly across several domains of functioning (Henshaw, Ogloff, & Clough, 2017). Firstly, Seto, Cantor, and Blanchard (2006) found that that CSEM offending is a stronger indicator of paedophilia than CSO against a child, as those who engaged in CSEM offending were more likely to demonstrate a paedophilic pattern of sexual arousal during phallometric testing than those who had offended against children. Those who engage in CSEM offending also demonstrate higher levels of sexual preoccupation and are more likely to use sex as a means of coping than those who engage in CSO (Babchishin et al, 2015; Elliot et al., 2009). Those who engage in mixed offending, however, demonstrate higher rates of paedophilia than both CSEM and CSO groups, and demonstrate more problems with sexual self-regulation than those who engage in CSEM offending alone (Babchishin et al., 2015).

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

In terms of their affective and interpersonal functioning, individuals who engage in CSEM offending have been found to demonstrate higher levels of loneliness and less assertiveness than those who engage in CSO, but demonstrate a greater internalised locus of control and report lower levels of personal distress (Bates & Metcalf, 2007). Magaletta, Faust, Bickart, and McLearn (2014) found that they are also more likely to experience difficulties with mood regulation and interpersonal functioning, demonstrated by higher levels of depression and borderline personality disorder. Difficulties in affective functioning are also highlighted in a study by Babchishin et al. (2011), who identified that individuals engaging in CSEM offending tend to demonstrate higher rates of emotional avoidance. In addition, only a minority of individuals engaging in CSEM offending experience difficulties with substance use (Wolak et al., 2011). Overall, Babchishin et al. (2015) identified that CSEM offending groups and CSO offending groups presented with similar psychological profiles, except the CSO group demonstrated more indicators of severe mental illness and higher levels of childhood difficulties and abuse.

Offence-related characteristics. Further research has found that those who engage in CSEM offending demonstrate higher levels of victim empathy and hold fewer cognitive distortions than those who engage in CSO or mixed offending (Babchishin et al., 2015; Elliott et al., 2009; Merdian, Curtis, Thakker, Wilson, & Boer, 2013). Elliot et al. (2009) found that for those who do hold cognitive distortions, individuals engaging in Internet sexual offending are more likely to hold ‘nature of harm’ cognitive distortions. More specifically, Elliot et al. (2009) identified that these individuals tend to endorse the belief that looking at CSEM does not cause direct harm and that looking is better than touching (see Ward and Keenan, 1999 for a more thorough discussion of cognitive distortions in individuals who have sexually offended). They also found that they are more likely to hold distortions related to children as sexual beings than those engaging in CSO, such as thinking that children are eager and

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

willing to engage in sexual activities (Elliot et al., 2009). It is important to note that although they endorse fewer cognitive distortions, these are often assessed using scales developed for CSO, which therefore may not assess distortions unique to CSEM offending (Merdian, Curtis, Thakker, Wilson, & Boer, 2014).

In addition to endorsing fewer cognitive distortions and demonstrating higher levels of victim empathy, individuals who engage in CSEM offending also display less emotional congruence with children and impulsivity, are less likely to have access to children, and have higher rates of self-control compared to those who engage in CSO (Babchishin et al., 2011). Finally, they also demonstrate less antisocial characteristics than individuals who engage in CSO and mixed offending (e.g., less prior offending, lower scores on antisocial characteristics measures, fewer problems with supervision) and demonstrate lower levels of aggression and psychopathy compared to those who engage in CSO (Babchishin et al., 2015).

Those who engage in mixed offending, compared to the CSEM-only group, demonstrate a higher sexual interest in children, tend to have more access to children, higher rates of unemployment, more previous violent offending, and more issues with substance use (Babchishin et al., 2015). Additionally, they are more likely to demonstrate indicators of Internet use discussed earlier, such as having a higher education, being male, Caucasian, etc. (Babchishin et al., 2015). They are more likely to experience issues with sexual self-regulation and childhood difficulties, but are less likely to engage in paedophilic social networks or have other negative social influences (Babchishin et al., 2015). When compared to those who engage in CSO, individuals engaging in mixed offending appear similar in terms of antisocial variables. This shows that they demonstrate both the antisocial characteristics exhibited in those who engage in CSO in addition to demonstrating higher levels of sexual deviancy.

Summary. Individuals who engage in CSEM offending can be conceptualised as individuals who may avoid social interactions, who come across as controlled and lacking in social skills, and who avoid risk taking outside of their CSEM offending (Garrington et al., 2018). Although they have higher levels of deviant sexual interests, Babchishin et al. (2015) postulate that individuals who engage in CSEM offending have more psychological and situational obstacles such as less access to victims, fewer antisocial characteristics, and greater victim empathy than both individuals who engage in CSO and mixed offending that prevent them from escalating to CSO. Magaletta et al. (2014) concluded that the CSEM-only group demonstrate difficulties in the socio-affective domain, but not in criminal and antisocial domains, suggesting that they demonstrate less issues relating to a pervasive pattern of criminal behaviour and lifestyle. Hence, to distinguish them from those who engage in mixed offending, it may be more important to assess antisocial characteristics rather than sexual interests and preoccupation (Henshaw et al., 2018).

Risk of Recidivism

Given that the characteristics of individuals who engage in CSEM offending suggest that they are meaningfully different in several domains of functioning, research has focussed on developing an understanding of the risk of recidivism of this group and whether risk factors for general or sexual recidivism are applicable, or whether unique factors need to be considered. It is important to note that recidivism rates of individuals who engage in CSEM offending are very low (Osborn & Beech, 2006). Despite this, many risk factors for general offending and CSO apply to this population, including youth, criminal history, unemployment, and substance use (Babchishin et al., 2011; Eke & Seto, 2012). However, research is limited regarding risk factors unique to this population. In terms of criminal history, Eke et al. (2011) found that those with previous violent or contact sexual offences were more likely to reoffend with any offence than those with previous CSEM or non-violent

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

offences. In a critical review of CSEM literature, Henshaw et al. (2017) conclude that traditional risk factors may not be relevant for individuals who engage in CSEM offending, as static risk assessments have been found to significantly overestimate their risk. This is largely due to items pertaining to the individual's relationship to the victim and having a previous non-contact offence (Osborn, Elliott, Middleton, & Beech, 2010). These items are not relevant as individuals possessing the material do not know the victim and because CSEM offences are most commonly non-contact by nature (e.g., possession or distribution of material; Henshaw et al., 2017).

A recent study by Seto and Eke (2015) found that age at time of investigation, prior criminal history, prior CSO, any failure on conditional release, a sexual interest in children, more male than female CSEM, and more male than female other child-related content were significant predictors of both online and offline sexual recidivism, providing tentative evidence that these risk factors are relevant for individuals who engage in CSEM offending. Furthermore, the authors found that lower education, being single, having non-Internet CSEM, prior sexual offending treatment, and not having depictions of adolescent minors were predictors of sexual reoffending.

A prominent concern regarding this offending population, particularly from a law enforcement perspective, is not only the risk they pose for future CSEM offences, but also whether CSEM offending is a potential gateway to CSO (Eke et al., 2011). Although studies in this area are in their infancy, a review by Henshaw et al. (2017) suggests that the current evidence does not support the notion that CSEM offending leads to CSO. Firstly, Glasgow (2010) points out that if CSEM is related to contact offending, an increase in contact offending statistics similar to that for CSEM offending should have been observed, which is not the case. Furthermore, research suggests that for those who engage in both CSEM and CSO, CSO tends to occur first (Faust et al., 2014; Seto et al., 2011; Seto & Eke, 2015). For

example, McCarthy (2010) found that 84% of individuals who had engaged in mixed offending had committed their CSO before engaging in CSEM offending. Eke et al. (2011) found that in their sample of 541 individuals who had engaged in CSEM offending, 18% had committed a contact offence before their CSEM offence, 8% committed it concurrently, and only 3.9% engaged in it after their CSEM offence during a nearly six year follow up.

In order to evaluate the likelihood that someone engaging in CSEM offending will also engage in contact offending, it appears that fewer antisocial characteristics prevent the escalation to contact offending (Lee, Li, Lamade, Schuler, & Prentky, 2012). Babchishin et al. (2015) found that the CSEM-only group show few antisocial characteristics and high sexual deviance, the CSO group demonstrate many antisocial characteristics and low sexual deviance, and the mixed offending group demonstrate both many antisocial characteristics and high sexual deviance. For this reason, individuals high on antisocial characteristics and deviant sexual interests are expected to be more likely to reoffend and engage in CSO, particularly as these factors have been identified as two of the strongest predictors of sexual recidivism (Hanson & Morton-Bourgon, 2005; Seto & Eke, 2015).

Theory

While few specific theories of CSEM offending exist, there have been several recent attempts to explain why individuals may engage in CSEM offending. The main approach to explaining CSEM offending has been to draw upon and adapt theories of CSO. More recently, however, researchers have looked at generating more tailored offence-specific explanations. The key theories are discussed below.

When drawing upon theories of CSO to apply to CSEM offending, theories such as Ward and Siegert's (2002) pathways model and Ward and Beech's (2006) integrated theory of sexual offending, have been used (Elliott & Beech, 2009; Middleton, Elliott, Mandeville-Norden, & Beech, 2006). As discussed by Elliott and Beech (2009), the findings that those

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

who engage in CSEM offending display similar clinical symptoms as those who engage in CSO, such as a deviant sexual interest and intimacy deficits, suggest that the application of CSO theories onto this population may be beneficial to begin understanding the causal processes that initiate and maintain CSEM offending. However, Elliott and Beech (2009) warn that as research has also found that a significant subgroup of the CSEM population do not share these clinical symptoms, the use of CSO theories runs the risk of not developing a detailed enough understanding of this subgroup and may be inappropriate for understanding the aetiology of their offending. For example, when assigning individuals who had engaged in Internet sexual offending to Ward and Siegert's (2002) pathways model, Elliott and Beech (2009) found that nearly half of the sample could not be assigned to any of the pathways, demonstrating the heterogeneity of the population and that not everyone demonstrates the same vulnerabilities as displayed by those who engage in CSO.

Elliott and Beech (2009) state that an increased focus on the unique situational context that the Internet provides is important to understand CSEM offending. Davis (2001) developed a cognitive-behavioural model of pathological Internet use, which posits that those who use the Internet in a pathological manner (e.g. excessive use of online sexual services or gambling) do so as a result of their maladaptive cognitions and behaviours that maintain or escalate their maladaptive responding. He explains the distal factors in the form of a diathesis-stress model, where the diathesis is existing psychopathology, such as depression or social anxiety, and the stressor is the introduction of the Internet or a form of new technology related to the Internet. Reinforcement forms a key factor in this, where if the response is positive after using the Internet for the first time, they are reinforced to continue using it. The proximal cause for their Internet use is maladaptive cognitions about the self and the world, and these factors then serve to maintain and escalate their pathological Internet use.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Quayle and Taylor (2003) expanded on Davis' (2001) model and introduced the Problematic Internet Use model to explain Internet sexual offending using qualitative data. They posit that there are distal (e.g., early sexual experiences) and proximal (e.g., sexual interest in children) setting events that are used to explain and normalise CSEM offending. These setting events and the disinhibition, availability, and anonymity of the Internet then relate to an individual's problematic cognitions and use of the Internet, which results in spending more time online, spending less time socially interacting with others, and increasing their technical capability. This process often results in the individual feeling powerful because they can find the material, use security measures, and gain status and credibility with other individuals in the CSEM community. Their CSEM engagement then escalates further as individuals often state they feel addicted to the material, especially as the Internet provides little external control to stop the behaviour, which is then used to justify spending more time online looking for more material.

The model then states that this process leads to five different types of offending: (1) downloading and/or collecting, where getting new material is important to socialise with others and exchange material, leading to increased fantasy and masturbation; (2) trading, where credibility is required to trade with others and is provided by their collection size or possessing rare images; (3) production (which involves CSO) either for personal use or to trade, as new material is desired and provides power and status; (4) CSO without production, where online fantasies are acted out in real life, and; (5) solicitation offending, which doesn't necessarily involve direct contact with a child. An outcome of non-offending behaviour also exists, where problematic Internet use leads to excessive use of legal pornography.

In summary, this model understands CSEM offending as a dynamic process involving a variety of behaviours including sexual arousal, collecting, and interacting with others online. These setting events, problematic cognitions about the self, and the material serve to

maintain their level of involvement with the Internet. Their involvement is then further maintained when they move from downloading material to joining the community component of CSEM offending, where individuals share knowledge of security measures and justify each other's behaviour and cognitions. This is further intensified as individuals spend more time online and less time interacting with others in real life, as this further reduces the opportunity for their thoughts or behaviours to be challenged by others. This model recognises that the Internet also empowers the individual by providing them with status, credibility, and a sense of belonging in an online community, which therefore increases risk-taking behaviour for these individuals who are often marginalised in society.

Quayle and Taylor's (2003) model provides a comprehensive overview of the unique environment in which CSEM and other types of Internet sex offending occurs. This model, coupled with the issues identified in applying theories of CSO offending to CSEM offending, highlights that these individuals present with various vulnerabilities and motivations, which then can result in a large variety of offending behaviours. This further demonstrates the heterogeneity inherent within the population of those who engage in CSEM offending.

Typologies of Individuals Engaging in CSEM Offending

As demonstrated above, research has found that individuals who engage in CSEM offending differ to those who engage in CSO in various domains of functioning. This suggests that they require a different conceptualisation and classification system to those used for individuals who engage in CSO (Middleton et al., 2006). Numerous typologies of individuals who engage in CSEM offending have been developed in order to make sense of the heterogeneity observed within this population (Seto, 2013). These include typologies of Internet sexual offending in general or CSEM-only, and distinguish subgroups either by their offending behaviour, motivations, or psychological characteristics. Typologies provide information on the characteristics of unique subgroups within a population, which helps to

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

begin to understand each group's offence processes, their risks and needs, and their risk of recidivism. This helps to inform investigations, rehabilitation, and risk assessment (Merdian, 2012; Sullivan and Beech, 2003). The following section will provide a review of existing CSEM typologies. A summary of all typologies discussed here can be found in Appendix A.

Typologies of offence type. Typologies such as those by Durkin (1997), McLaughlin (2000), and Alexy, Burgess, and Baker (2005), distinguish groups solely by the type of online sexual offending they engage in. Durkin (1997) distinguished individuals by those who use the Internet to traffic CSEM, to locate children to commit CSO against, to interact in a sexually inappropriate way with children, and to network with others who share the same sexual interest in children, as this serves both an information and a validation function for the individual.

McLaughlin (2000) assigned individuals into several categories: travellers, collectors, manufacturers, and chatters. Travellers are those who use the Internet to groom potential victims and are contact-driven, whereas collectors engage in the collection and trading of CSEM and do not engage in CSO. Manufacturers are those who produce CSEM for distribution and often also engage in CSO, whilst chatters are those who collect child erotica instead of explicit CSEM and may also chat with victims online. McLaughlin conceptualises chatters as a bridge between collectors and travellers. Out of 200 cases of police investigations in the United States, McLaughlin found that most individuals who had committed CSEM offences (71.5%) could be classed as collectors, 24% as travellers, 4% manufacturers, and one person as a chatter.

Finally, Alexy et al. (2005) distinguished groups according to law enforcement classifications of traders, travellers, and trader-travellers by analysing a sample of 225 cases of Internet sexual offending from media stories. Traders are those who engage in the collection and distribution of CSEM and who may be charged with production, possession,

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

and/or distribution. Travellers are those who engage in the solicitation of children online, meet up with children in real life, and demonstrate a wide range of sexual interests, whereas trader-travellers are those who engage in both CSEM offending and travelling to meet up with a child for sexual interactions. Of their sample, 59.1% were traders, 21.8% were travellers, and just over 19% were trader-travellers.

These typologies are a good starting point for understanding the different forms of online child sexual offending that exist and distinguishing individuals whose online sexual offending facilitates their CSO. However, they are limited in terms of their practical utility as they only differentiate individuals by the offence type, but do not provide further information on the characteristics of these groups to guide clinical and forensic practice, which a good typology should serve to facilitate. Furthermore, except for McLaughlin's (2000) distinction between collectors and manufacturers, these typologies tend to group all types of CSEM offending together, whereas there may be important within-group differences. More specifically, this is not externally consistent with the current research, as production of CSEM necessarily involves CSO, and important differences have been found between those who engage in CSEM and mixed offending. This indicates that grouping all these individuals together will be missing out on important group differences. Additionally, these categories are not mutually exclusive as individuals can engage in multiple behaviours, and it also fails to take into consideration the fact that CSEM can be used for those who are contact-driven, such as using it to desensitise victims and normalise the behaviour in the material (Kloess et al., 2017).

There are also issues with the methodologies of Durkin's (1997) and Alexy et al.'s (2005) typologies. Whilst McLaughlin (2000) used a large sample size and adopted an empirical approach, Durkin did not provide information regarding the methodology for these categorisations, meaning it is unknown whether it is valid or reliable. Alexy et al.'s typology

also presents some methodological issues as its sample consisted of media stories. This is inherently problematic because stories deemed 'newsworthy' are more likely to be published and are often more sensational than most cases of online sexual offending. Due to this publication bias and the fact that it was a qualitative method, these findings are unable to be generalised to all individuals who have engaged in online sexual offending.

Typologies of offence characteristics. Although typologies focussed on the offence type are limited in their practical utility, researchers including Hartman, Burgess, and Lanning (1984), Krone (2004), and Carr (2006) developed typologies based on individuals' offence characteristics, which provide more detailed categories.

Hartman et al. (1984) developed a typology of CSEM collectors using qualitative data from interviews with 14 collectors. They identified four types: closet collectors, paedophile collectors, cottage collectors, and commercial collectors. Closet collectors keep their CSEM collecting a secret and deny communicating with other collectors or engaging in CSO. This group usually purchases CSEM commercially and acknowledge that adults should not sexually abuse children. Paedophile collectors are a group of individuals who engage in both CSEM collecting and CSO and may produce their own material. They usually sexually abuse one child at a time and the level of organisation of their CSEM collection varies widely.

Cottage collectors are the largest group of collectors characterised by sexually abusing children in a group and producing and collecting CSEM to communicate and create relationships with other paedophiles. These individuals often have trusted positions within the community and sell CSEM. They also make children available to others to make money in order to fund activities with children. However, the authors state that money is not the primary motivation. Cottage collectors use CSEM to arouse themselves, desensitise children, and instruct children what to do in sexual acts. Finally, commercial collectors collect CSEM

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

for financial profit, have a group of children who they sexually abuse, and who also have access to other collectors with their own groups of children.

Aslan (2011) states that Hartman et al.'s typology is an important first step for providing descriptive categories of CSEM collectors before the Internet, and although it was not developed for Internet offending, it could still apply to online CSEM offending.

Furthermore, Beech, Elliott, Birgden, and Findlater (2008) note that a strength of this typology is that it comprises a continuum ranging from individuals who engage in CSEM offending without engaging in CSO, to those who produce and sell material of their own contact offending. However, Hartman et al.'s (1984) typology is not externally consistent with current research. It states that cottage collectors are the largest group, however this group engages in CSO whilst the research indicates the majority of CSEM collectors do not engage in contact offending (Eke et al., 2011; Elliot et al., 2009).

Next, one of the most detailed typologies is that proposed by Krone (2004). Classes within this typology are rated by the severity of offending according to their types of involvement, level of networking, and security level employed. He identifies nine classes within three clusters: indirect abusers, direct abusers, and distributors. Indirect abusers are those who engage in non-contact CSEM offending, and categories within this cluster include: browser (those who access CSEM accidentally but decide to save it), private fantasy (those who fantasise about children and seek out CSEM), trawler (those who collect a variety of pornography and engage with CSEM out of curiosity), non-secure collector (those who download or distribute CSEM through open sources), and secure collector (those who collect CSEM and use sophisticated techniques to hide their offending). Krone hypothesises that increased active searching for CSEM will lead to more networking with others, which is likely to lead to receiving more extreme material and thus engaging in trading of the material, which requires a higher level of security.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

The direct abusers cluster in Krone's (2004) typology involves: groomer (those who focus primarily on solicitation but use CSEM as part of their online interactions), physical abuser (those for whom CSEM is supplementary to their contact offending either for fantasies or as a record of their offending), and producer (those who produce and distribute CSEM), where CSEM forms part of a varying offence process. Finally, the distributor subgroup (those who possess CSEM for the purpose of sale and distribution and are sexually motivated) can occur at any of these levels. It is unclear how Krone (2004) developed this typology as no methodology is provided, so it is presumed that it was developed based on professional experience (Seto, 2013).

Krone's (2004) typology has been highly regarded by researchers due to its distinction between various types of Internet offending. In addition, it takes into account the escalation in technical capability and the importance of social interaction with other individuals also engaging in CSEM offending (Beech et al., 2008); especially as theory of the aetiology of CSEM offending highlights social interaction as an important component as it provides a sense of validation and credibility in the online community (Quayle & Taylor, 2003). However, Krone's typology has been criticised by Aslan (2011), who states that although the offending behaviours are clearly classified, it does not provide any information on their potential motivations or risk of also engaging in CSO, which are critical to informing any kind of meaningful practice (e.g., prediction, treatment, intervention, etc.).

Finally, Carr (2006) conducted a study of 145 individuals who had committed objectionable publication offences (mostly CSEM) in New Zealand between 2000 and 2002 using multidimensional scaling analysis. Carr developed a typology according to the Internet application they used to access the material. She found that those who did not have a preference for Internet application were likely to live alone, be 40 years and older, have engaged in CSO, interact with children online, create websites and/or sell the material, and

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

associate with others who have also engaged in CSO. Those who preferred Internet Relay Chat (an instant messaging application) were likely to work in a team environment, spend less than 30 hours per week online, and had no previous physical offences (including both sexual and non-sexual offences).

Furthermore, Carr (2006) those who used newsgroups to obtain material were likely to be unemployed and have a previous conviction for a physical crime. Both those who used newsgroups and the fourth group who used email and instant messenger were likely to possess more than 979 objectionable images and images sourced outside of the Internet. Those who used email and instant messenger were also likely to live with a partner, interact with others online, spend more than 30 hours per week online, produce their own material, have previous physical or objectionable publication offences, have access to potential victims, and have organised collections, among others. Merdian et al. (2013) reviewed Carr's (2006) findings and suggested that a higher level of engagement with CSEM is associated with a higher level of social interaction with others and using better security methods to avoid detection.

Carr's (2006) classification, unlike many typologies of CSEM offending, was empirically derived using a relatively large sample size, meaning it is likely to be more reliable and valid than those that were developed from clinical experience. Furthermore, it includes a variety of individual and offence variables that distinguish important within-group differences and provides an indication for which applications higher risk individuals may be using. For example, the group who used email and instant messenger demonstrated a large number of risk-related characteristics identified in the literature, such as access to children, previous offending, and producing their own material (Merdian et al., 2013), which helps to identify which offending patterns are associated with higher risk groups to point to areas of future assessment and treatment approaches. However, Carr's typology is relatively outdated,

as the typology differentiated individuals based on the Internet applications they used to access the material. This data was collected between 2000 to 2002, and technology has changed significantly since then, with users now being able to use the Dark Web, livestreaming, or peer-to-peer networks. Therefore, developing a typology based on such factors means it risks becoming quickly outdated and will not be applicable with the new state of technology.

Overall, however, it is important to note that all three of these typologies are again limited by a lack of empirical validation. Krone's (2004) typology was presumably a rational formulation as no information was provided regarding its methodology (Seto, 2013). This calls into question whether this typology is reliable and if similar patterns would be found in real data. Although Hartman et al. (1984) did develop their typology using data, it was developed on the basis of 14 interviews. Although qualitative methods extract rich detail about offence processes, their characteristics, and cognitions, the small sample size calls into question the generalisability and reliability of this classification. Finally, Carr's (2006) typology was developed empirically using a large sample size, which is not common in this area. However, the multidimensional scaling techniques used to develop these group distinctions have been criticised for being subjective, as these decisions are based on visual judgments of where the points cluster together (Cooper & Ajoku, 2017).

Typologies of psychological characteristics. Henry, Mandeville-Norden, Hayes, and Egan (2010) investigated whether categories of those engaging in Internet sexual offending could be identified based on psychometric scores. They conducted a cluster analysis on 442 individuals who had been convicted of Internet sexual offences in the United Kingdom using their pro-offending characteristics (victim empathy, cognitive distortions, and emotional congruence with children) and socio-affective characteristics (self-esteem, emotional

loneliness, locus of control, personal distress, assertiveness, socially desirable responding, and impulsivity).

The authors identified three clusters. Cluster 1 was labelled the ‘normal’ group as they demonstrated scores within the normal range for all measures except for self-esteem, which was slightly lower. Cluster 2 was labelled the ‘emotionally inadequate’ group as they demonstrated pro-offending scores in the normal range but scored low on socio-affective measures, indicated by lower self-esteem, higher emotional loneliness, personal distress, under-assertiveness, and great external locus of control. Cluster 3 showed mixed results for pro-offending and socio-affective measures, with personal distress, locus of control, and under-assertiveness in the normal range but also demonstrating low self-esteem and high emotional loneliness. As this group demonstrated higher scores on pro-offending measures than the other two clusters, this group was labelled ‘deviant’.

This typology has several strengths as it was empirically derived using a large sample and is one of the few typologies to classify individuals based on their pro-offending and socio-affective characteristics, which provides a useful insight into the characteristics and criminogenic needs of those engaging in Internet sexual offending. As it is one of the few that focusses on psychological characteristics, its clinical utility in both forensic and clinical settings is relatively enhanced as it can help to inform better rehabilitation approaches as well as provide a focus for future research. Further research is required in order to identify whether these groups vary in their offending behaviour and level of risk.

Typologies of motivations. Lastly, several typologies have been developed that move beyond the offending behaviours and psychological characteristics and focus on individuals’ motivation for engaging in CSEM offending. These include those developed by Lanning (2001), Sullivan and Beech (2004), Beech et al. (2008), and Merdian (2012).

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Lanning (2001) adapted his initial conceptualisation of CSO and proposed a continuum ranging from preferential offending to situational offending. Situational offenders are those who obtain CSEM on a one-off basis due to impulsivity, curiosity, for sexual gratification, or wanting to earn money through trading. Conversely, preferential offenders are defined as those who intentionally obtain CSEM in a repeated fashion and either have paedophilic interests or generally deviant sexual interests. Therefore, preferential offenders are conceptualised as more intentional and conscious offenders, whereas situational offenders obtain CSEM in a more opportunistic fashion. Those conceptualised as preferential offenders are perceived to be persistent, long-term offenders who have developed highly skilled techniques for obtaining CSEM with reduced chances of identification. Lanning (2001) also identified a third miscellaneous group including media reporters or individuals who try to conduct their own investigations into CSEM offending.

The idea of conceptualising individuals on a continuum is a notable strength of Lanning's (2001) typology, as it captures the heterogeneity of this population where individuals may not necessarily fit into discrete categories. This approach has also been praised for its ability to account for numerous motivations involved in CSEM offending (Aslan, 2011). However, this typology cannot account for those with generally deviant sexual interests who do not use the Internet in a repeated fashion (Aslan, 2011; Beech et al., 2008). Beech et al. (2008) provide an example of this, stating that individuals who have deviant sexual interests and use CSEM but are not sexually interested in children would therefore access this material infrequently, making them situational offenders, but if they continue to access the material they would be considered preferential. Furthermore, grouping all individuals who are motivated by money, curiosity, impulsivity, and sexual gratification together is likely to obscure important group differences.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Sullivan and Beech (2004) have proposed a typology of motivations consisting of three classes based on individuals who were identified in a police operation as engaging in CSEM offending. The first group consists of those who collect CSEM and engage in a wider range of sexual offences, possibly involving CSO. The second group collects CSEM in order to satisfy their developing sexual interest in children and the third group are those who access CSEM out of curiosity. Although the motivations are relatively clear for the second and third groups, the definition of the first group tends to focus more on the offending behaviour rather than their motivation for engaging in this behaviour. In addition, it does not appear to be comprehensive and fails to account for several motivations that have been identified as important in the literature, such as engaging in CSEM offending for financial gain or as part of a wider interest in deviant sexual material (Merdian et al., 2013).

In an attempt to consolidate the current state of knowledge, Beech et al. (2008) developed a typology by summarising the existing ones (Alexy et al., 2005; Hartman et al., 1984; Krone, 2004; Lanning, 2001; Sullivan & Beech, 2004). The first group are periodically prurient individuals who access CSEM impulsively or out of curiosity on a sporadic basis. This may form part of their interest in pornography in general, such as in extreme material, and may not be related to a sexual interest in children. The second group are fantasy-only individuals who engage in CSEM offending to fuel their sexual interest in children but do not engage in CSO. The third group are direct victimisation individuals who engage in online CSEM and solicitation offending to facilitate later CSO. The fourth and final group are commercial exploitation individuals who produce or trade CSEM for financial profit. Although this typology is a comprehensive summary of the existing CSEM typologies, the fact that the typologies it is based on are methodologically problematic means that the summary is likely to be problematic too. The authors acknowledge this and state that typologies need to be empirically tested before they are adopted into practice.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Finally, Merdian (2012) developed a model for the classification, assessment, and treatment of individuals who engage in CSEM offending by combining theoretical and empirical models. As part of the empirical model, Merdian recruited 39 participants from community sex offender treatment centres or prison, of which 22 individuals had engaged in CSEM offending only and 17 individuals had engaged in mixed offending. Merdian evaluated them on various risk, clinical, and offence variables, and statistical analyses revealed five unique subgroups of CSEM users. The two main groups were Contact-driven Users (those who are focussed on CSO against children; $n = 15$) and Fantasy-driven Users (those using CSEM for sexual arousal with little cross-over to CSO; $n = 12$). The remaining smaller groups were Extreme Material Users (those who prefer extreme material; $n = 2$), Cautious Users (those who used various types of safe-keeping; $n = 2$), and Social Users (those who socialise online with other individuals also engaging in CSEM offending; $n = 2$). Six individuals were unable assigned into any of the existing groups, the majority of whom were producers of CSEM, leading the author to conclude that there may be important differences between those who produce CSEM and those who view it. Further analysis also revealed that engaging in CSO, possessing fantasy-generating material (e.g. fictional CSEM), and social contact with other CSEM users were key in this classification.

In brief, Merdian (2012) developed a final model in which individuals are assessed according to whether they are contact-driven (Contact-driven Users, Cautious Users) or fantasy-driven (Fantasy-driven Users, Extreme Material Users, and Social Users). Contact-driven individuals are further assessed for how much fantasy-based CSEM they possess and are said to require a contact-driven assessment and treatment approach. For fantasy-driven individuals who have not engaged in CSO, they are further assessed according to whether they possess high or low levels of fantasy-generating CSEM and whether they engage in high

or low levels of social contact with other CSEM users. Individuals on this pathway are said to require a fantasy-driven assessment and treatment approach.

Merdian's (2012) classification combines the motivation for engaging in CSEM offending with the importance of networking with others to provide information on how clinicians and researchers can identify appropriate assessment and treatment approaches. Clinicians can use this classification system to identify criminogenic needs, the severity and risk of their offending, and what assessment and treatment response is most appropriate. Furthermore, as stated by the author, this is a dynamic typology in which individuals can switch pathways as their offending behaviour progresses, meaning that individuals are not stuck in one category as is the case in classification systems based purely on static variables. Initial empirical support for this typology was found by Merdian et al. (2018), however the sample size used in the initial study by Merdian (2012) is extremely low and six individuals could not be classified, which means further validation and replication with a larger sample size is required.

Overall, typologies of motivations tend to group individuals based on whether they have a sexual interest in children, a general interest in more extreme forms of pornography, or a non-sexual interest. They also consider whether individuals are engaging in, or are motivated to engage in, CSO. However, similar methodological issues arise with these typologies as with those previously discussed, as some were not empirically developed (Beech et al., 2008; Lanning, 2001) or had small sample sizes (Merdian, 2012), which means they require further empirical testing before they can be adopted into practice.

Summary of typologies. As demonstrated, many typologies of individuals who have engaged in CSEM offending or online sexual offending exist. Many of these reflect the diversity in CSEM offending and classify individuals based on either their CSEM offence type, their offending characteristics, their psychological characteristics, or their motivations.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Overall, it appears that typologies of motivations and psychological characteristics are starting to address the issues plaguing CSEM typology research, in that they are able to be used to guide clinical and forensic responding and are starting to be empirically validated in subsequent research. However, empirically derived, comprehensive typologies concerning their individual and offence characteristics are lacking, as existing typologies of offence type and offence characteristics lack practical utility, are not empirically derived using large samples and robust statistical methods, and fail to provide sufficient detail to contribute a comprehensive classification of the offending behaviour and individual characteristics. Merdian (2012) has begun to address this issue by including individual and offence characteristics to develop her classification, however this requires further validation with a larger sample size.

Given the heterogeneity observed in the behaviour and individual characteristics of those engaging in CSEM offending, a detailed, empirically derived typology using a large sample is required in order to develop a better understanding of offending behaviour and individual differences between them. This will help to develop a more refined understanding of individuals engaging in CSEM offending and will help to inform clinical, forensic, and law enforcement responding. For instance, Henshaw, Ogloff, and Clough (2018) highlight that research regarding their online offending characteristics are limited, and that further investigation of their personal and offence process characteristics are required in order to have a better understanding of their characteristics, risks, and treatment needs.

Study Objectives

The current study aims to develop an empirically based typology of child sexual exploitation material offending in New Zealand using a large pre-existing data set. The typology will be developed using individuals' offence characteristics, and between-group differences in individual characteristics will also be examined to identify subgroups and

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

investigate the extent to which they differ on important characteristics. In addition, this study will partly replicate the research conducted by Merdian (2012), but will use a larger sample size, a different methodological approach, and some different variables. If subgroups of individuals who engage in CSEM offending exist, this will help to provide insight into the characteristics of these groups in order to address current limitations in the literature, guide future research, and inform assessment and treatment approaches. In addition, this typology could be used to guide resource allocation in an investigation context. Due to its exploratory nature, the current study does not propose any hypotheses.

Method

Participants

The current study employs a data set consisting of 557 individuals who have been identified by the Department of Internal Affairs (DIA) in New Zealand as engaging in CSEM offending between 1996 to 2018. The sample has a mean age of 36.74 ($SD = 14.12$) and consists of one female and 556 males. Ninety-three percent of participants identified as European ($n = 519$), 3.2% as Asian ($n = 18$), 2.3% as Māori ($n = 13$), 0.2% as Pacific Peoples ($n = 1$), and 1.1% as other ($n = 6$), and. Nearly a quarter (24.6%) of individuals resided in the Auckland area and 18.3% resided in the Canterbury area. The remaining individuals lived either in other parts of the North Island (43.6%) or the South Island (13.4%). The vast majority of individuals were employed (79.4%). Finally, in terms of the nature of their CSEM offending, 94.3% engaged in possession, 57.8% engaged in distribution, and 5.0% engaged in production.

Procedure

The data set was created by the Censorship Compliance Unit (CCU) at the DIA in New Zealand, which is involved in enforcing compliance with the Films, Videos, and Publications Classification Act 1993. One advisor compiled the details of every person identified by the DIA as engaging in CSEM offending, which was corroborated with the investigators working on the case. The original data set was provided in Excel, which was transformed into an SPSS file and saved on password protected external hard drives. The data set contained detailed information on each individual's demographic variables, offence characteristics, offending history, and sentencing outcomes. Each variable provided in the data set was then assessed for inclusion in the typology. A discussion of which variables were included and excluded is presented below, in addition to a discussion of the statistical analyses used to form the typology. Ethics approval for this project was granted by the

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Victoria University School of Psychology Human Ethics Committee (application number 0000026039).

Study Variables

Variables were deemed appropriate for inclusion if they had been included in previous typologies or had been identified as important in the current literature. In addition, the statistical analysis used in this study (latent class analysis; LCA) becomes too complex to interpret if there are too many variables (Mundy, 2012). For this reason, only variables with a strong support in the literature for its inclusion in the typology were selected. As the current study partly replicates that by Merdian (2012), the variables employed in the current study are similar to those employed by Merdian (e.g. employment, relationship status, offending history, engagement with material). However, some variables included in Merdian's (2012) classification were unable to be included because the information was not available (e.g. interacting with minors online, overall length of time engaging in CSEM offending).

Excluded variables. Several variables pertaining to individuals' demographic characteristics, offence characteristics, and sentencing outcomes were excluded from the typology. More specifically, their location, ethnicity, gender, storage medium, remorse, collection size, sentencing outcomes, and how they were identified were excluded. Sentencing outcomes and the medium on which they stored CSEM were excluded because they were deemed to be a reflection of the time period in which individuals offended. Data storage changes significantly over time and group differences in storage medium are likely to reflect the time period in which they offended rather than identifying important group differences. In addition, sentencing outcomes were excluded because sentencing laws in New Zealand have become more severe over time. For example, the Films, Videos, and Publications Classification (Objectionable Publications) Amendment Act 2015 increased the maximum penalty for possession of CSEM or other objectionable material from five years to

10 years imprisonment. Therefore, including this variable in the typology would make it difficult to ascertain whether group differences in sentencing outcomes are due to risk and/or severity, or whether it is a reflection of the time period in which they were sentenced.

Further variables including location and how their offending was identified were excluded because they have not been deemed important factors in the CSEM literature to date. Furthermore, gender and ethnicity had to be excluded from the data due to a lack of variability in the data. Finally, remorse and collection size were excluded. Firstly, remorse was excluded because there is currently no sufficient evidence to suggest that it is an important factor for recidivism in the CSO (Mann, Hanson, & Thornton, 2010), nor has it been highlighted as an important differentiating characteristic in the CSEM field. It has been discussed by some authors in the context of antisocial characteristics (e.g., Babchishin et al., 2015), however, empirical work in this area is limited. Secondly, collection size was also excluded, because authors such as Glasgow (2010) state that currently individuals can easily download large collections all at once. This means that the collection size itself may not be a psychologically meaningful factor, and instead Glasgow (2010) suggests that other characteristics such as their engagement with the material are more meaningful.

Indicator variables. Once the excluded variables were removed, the indicator variables were selected. Indicator variables are the variables which are used in the LCA to form the typology. Many typologies of sexual offending tend to use offence characteristics as the indicator variables and then use individual variables in the external analyses once the classes have been identified (e.g., Kaseweter, Woodworth, Logan, & Freimuth, 2016; Mundy, 2012). Hence, the indicator variables used in the current study are the offence characteristics, which consist of both dichotomous and ordinal variables.

The indicator variables include the individuals' level of engagement with the material, technical capability, charge type, and search terms used. Engagement, technical capability,

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

and charge type were chosen because they have been used in previous typologies (Alexy et al., 2005; Beech et al., 2008; Carr, 2006; Hartman et al., 1984; Krone, 2004; McLaughlin, 2000; Merdian, 2012). Engagement with material has also been highlighted as an important variable in the literature (Glasgow, 2010), whilst charge type is an important factor as significant differences have been found between individuals committing different CSEM charges (e.g., between those engaging in CSEM offending and mixed offending, which necessarily involves CSO; Babchishin et al., 2015), providing further support for their inclusion. Finally, search terms were included because previous research has made distinctions between an interest in prepubescent content and an interest in deviant sexual material in general (Lanning, 2001; Merdian et al., 2013), in addition to research finding tentative evidence that those who prefer male victims are at higher risk of reoffending (Seto & Eke, 2015). Analysing search terms will enable an investigation of whether different groups were seeking out only CSEM or whether they were looking for deviant material in general (e.g., bestiality, sadism), and whether they indicate a preference for the gender of the victim. As individuals are likely to seek out material that is sexually arousing to them (Glasgow, 2010), analysis of their search terms will provide an indication of their sexual interests.

Engagement with material is an ordinal variable that was scored on a scale of one to five, with one defined as ‘collector’, three defined as ‘collects with specific focus of material type’, and five defined as ‘interacts with or enhances material’. Scores of two and four are defined as scores for individuals whose engagement fell in between these scores. Technical capability is also an ordinal variable that was scored on a scale of one to five, with one defined as a ‘simple viewer’, three defined as those who use encryption, and five for those who use safe networks/platforms. Again, scores of two and four are for those whose technical

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

capability fell in between these scores. These variables were already coded by the DIA and did not require recoding.

Information on each person's CSEM charge type was transformed into three dichotomous variables: possession, distribution, and production. These were recoded as either 1 for 'yes' and 0 for 'no'.

Finally, the data set contained information on the search terms individuals used to find the material. These search terms were transformed into four variables: whether they searched for male victims, female victims, prepubescent material, and other paraphilic material. All four of these variables were coded as 1 for 'yes' and 0 for 'no/not specified'. In order to code for prepubescent and other paraphilic material, the definitions from the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association, 2013) were used. Hence, individuals looking for victims aged 13 or younger were coded as 'yes' for prepubescent material in order to identify those with paedophilic interests, and those searching for other paraphilic material related to sadism, masochism, zoophilia (bestiality), urophilia (urination), coprophilia (faeces), fetishism, and/or voyeurism were also coded as 'yes'. The coding form for the search terms, including definitions, can be found in Appendix B.

In order to ensure that the researcher was coding the search terms correctly, an interrater reliability test was conducted with another researcher using a testing set of 55 individuals (approximately 10% of the sample). Cohen's k was calculated to determine the interrater reliability, with values above .80 demonstrating excellent interrater reliability. Interrater reliability was excellent for gender of victim ($k = .94, p < .001, 96.4\%$ agreement), prepubescent material ($k = 1.00, p < .001, 100\%$ agreement), and other paraphilic material ($k = .90, p < .001, 96.4\%$ agreement).

External variables. The external variables in this study are the individual variables. As discussed, these will be used in the external analyses to gain a more detailed understanding of the classes developed by the LCA. These external variables include employment, relationship status, access to children, and recorded offending history. These variables were chosen as they have been identified as important factors in the CSEM literature, in addition to offending history being included in previous typologies that differentiate between individuals who engage in CSEM offending and mixed offending (Carr, 2006; Hartman et al, 1984; Krone, 2004; McLaughlin, 2000; Merdian, 2012; Sullivan & Beech, 2004).

For employment, the data set provided information on the individual's occupation and this was transformed into a dichotomous variable coded as 1 for 'yes' (employed) and 0 for 'no' (unemployed). Individuals were coded as 'yes' on this variable if they had a job or were students and they were coded as 'no' on this variable if they were unemployed or pensioners. Relationship status was also transformed into a dichotomous variable, with those who were either married or in a de facto relationship coded as 1 for 'yes' (in a relationship) and those who were single, divorced, widowed, or separated coded as 0 for 'no' (single). Additionally, access to children was transformed into a dichotomous variable, where individuals were scored a 1 for 'yes' on this variable if they had access to children in the home, outside the home (clubs, extended family, church, etc.), in their work environment, or travel. Those with no access to children were coded as 0 for 'no'.

Finally, individuals' offending history was transformed into three dichotomous variables: previous sexual offending, previous CSEM offending, and previous other offending. Previous other offending includes any violent, drug, antisocial, dishonesty, or property offences. Information on the type of previous sexual offence was not available for all individuals in the data set, therefore previous sexual offences here are defined as those

perpetrated against children and adults. All three of these variables were again coded as 1 for 'yes' or 0 for 'no'.

Statistical Analysis

The current research will employ a form of mixture modelling called LCA. LCA is a statistical method that can be used to group individuals into homogenous categories using both nominal and ordinal categorical data (Geiser, 2013). Geiser explains that in LCA, "individual differences in observed item response patterns are explained by differences in latent class membership, where each class shows a characteristic, class-specific response profile" (2013, p. 232). LCA was chosen over other traditional cluster analysis techniques (such as those used in Merdian's, 2012, classification) because it groups individuals based on model probabilities, whereas traditional clustering techniques use distance measures to create the groups. This means that LCA is a more objective analysis because it uses formal criteria to decide on the final number of groups (Vermunt & Magidson, 2002). As empirical CSEM typology research is limited, the current analysis will conduct an exploratory, rather than confirmatory, LCA. The LCA will be conducted using Mplus software.

The number of classes that are chosen depends on the model fit statistics, interpretability of the classes, parsimony, and existing theory and research (Porcu & Giambona, 2017). However, as empirical data on CSEM typologies is limited, this impacts the ability of existing typologies to influence the number of classes chosen. Therefore, the number of classes will instead be chosen based on the model fit statistics, whilst also choosing the number of classes that are easily interpretable and are the most parsimonious. Models with up to seven classes will be tested, as more classes than this will become too complex and will affect the ability to meaningfully interpret the classes.

The model fit statistics that will be used to choose the number of classes include the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), the sample-

size adjusted BIC (SSBIC), entropy, and the Bootstrap Likelihood Ratio Test (BLRT). AIC, BIC, and SSBIC are information-theoretic methods, with smaller values indicating superior model fit (Geiser, 2013). Entropy is an indication of the quality of the classification of individuals to classes, with values closer to 1 indicating high classification accuracy (Geiser, 2013). Entropy values of approximately .80 or above are preferred. Finally, the BLRT is a parametric bootstrapping procedure which provides a p -value that compares the current model with another model that has one less class. A significant result ($p < .05$) means that the current model is a better fit for the data than a model with one less class (Geiser, 2013). If the result is not significant, then the simpler model with one less class is a better fit. Overall, the model with the fewest classes is preferred.

Some studies suggest that BIC is the best indicator for deciding on the number of groups (Hagenaars & McCutcheon, 2002; Magidson & Vermunt, 2004), whilst others suggest the SSBIC is better (Tofighi & Enders, 2007; Yang, 2006). Conversely, Nylund, Asparouhov, and Muthén (2007) found that the BLRT was more superior than the BIC at determining the number of classes. As there is currently no consensus on what information is superior for deciding on the final number of classes (Nylund et al., 2007), they will be evaluated together in order to determine the number of classes that best fits the data, as done so by other researchers (e.g., Deslauriers-Varin & Beauregard, 2010; Turner, Miller, & Henderson, 2008).

Some additional considerations also apply for model selection. Firstly, the average latent class assignment probabilities demonstrate the quality of the fit of the model, where values closer to 1 indicate that individuals have been classified into their most likely latent class with high certainty (Geiser, 2013). This value should be .80 and above (Rost, 2006). Finally, the log likelihood value, defined as “the measure of the probability of the observed data given the model and is used as the basis for calculating various fit statistics” (Geiser,

2013, p. 238) should replicate for the model to indicate that local likelihood maximum is not an issue. Local likelihood maximum is when the solution with the best log likelihood value cannot be found due to insufficient starting values, which means that the model may have inaccurate fit statistics. Therefore, it is important that the log likelihood value replicates for the final chosen model.

Once the model of best fit has been chosen using the indicator variables, several post-hoc tests will be conducted in SPSS. Firstly, all individuals will be assigned to a class based on their most likely class membership probabilities. Then, to examine whether there are statistically significant differences between classes on the indicator variables, chi square tests of independence will be conducted for the dichotomous variables (possession, production, distribution, female victim, male victim, prepubescent victim, and other paraphilic material). The column proportions of the chi square tests will then be examined to determine between which particular classes the differences lie. Next, Kruskal-Wallis tests will be conducted for the ordinal variables (engagement and technical capability) to see if there is an overall statistically significant difference between the classes. Post-hoc Mann-Whitney U tests will then be conducted to see where the differences lie. Subsequently, to gain a better understanding of the classes, post-hoc tests will be conducted to see whether classes differ significantly on external individual variables. To evaluate this, chi square tests of independence will be conducted for differences in the dichotomous variables (employment, relationship status, access to children, previous sexual offending, previous CSEM offending, and previous other offending) and a one-way ANOVA will be conducted to evaluate differences in age across the classes.

Results

Descriptive Statistics

The descriptive statistics for the external variables, as shown in Table 1, demonstrate that individuals in this sample are generally in their mid-to-late thirties, employed, and single, with just under half of the sample having access to children (42.6%). The vast majority (78.3%) have no offending history, whilst approximately 1 in 10 have engaged in previous sexual offending (10.6%) and previous other offending (8.8%). As individuals can answer ‘yes’ to more than one of these offence categories, the percentages do not add to 100%. Table 2 depicts the descriptive statistics for the indicator variables. This demonstrates that possession is the most common charge type and that the overall sample demonstrates moderate levels of engagement and technical capability. In their search terms, female victims were searched for more frequently than male victims, around two thirds of the sample searched for prepubescent material, and most did not seek out other paraphilic material.

Table 1
Descriptive results for external variables (N = 557)

Variables	Frequency <i>n</i> (%)	<i>M</i> (SD)
Age		36.74 (14.12)
Employment	442 (79.4)	
In a relationship	137 (24.6)	
Access to children	237 (42.6)	
Offending history		
None	436 (78.3)	
Sexual	59 (10.6)	
CSEM	32 (5.7)	
Other	49 (8.8)	
Missing	5 (0.9)	

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Table 2

Descriptive results for indicator variables (N = 557)

Variable	Categories	Frequency n (%)
Engagement with material	1	27 (4.8)
	2	53 (9.5)
	3	306 (54.9)
	4	126 (22.6)
	5	44 (7.9)
	Missing	1 (0.2)
Technical capability	1	57 (10.2)
	2	218 (39.1)
	3	239 (42.9)
	4	37 (6.6)
	5	5 (0.9)
	Missing	1 (0.2)
Charge type		
Possession		525 (94.3)
Distribution		322 (57.8)
Production		28 (5.0)
Search terms		
Female victim		204 (36.6)
Male victim		87 (15.6)
Prepubescent material		375 (67.3)
Other paraphilic material		90 (16.2)

Results of the Latent Class Analysis

The LCA was conducted using the indicator variables, and models ranging from one to seven classes were tested, the results of which are demonstrated in Table 3. The model fit statistics were evaluated in order to decide on the number of classes that best fit the data. The log likelihood value replicated for each model, indicating that local maximum likelihood was not an issue. The AIC value decreased for every model but started to plateau after the four-class model, indicating that the fit of models larger than four classes is only marginally better. The SSBIC also preferred the four-class model as this was the model with the lowest SSBIC value. However, the BIC value was lowest for the two-class model. Models with one, five, six, and seven classes were subsequently rejected based on these information criteria.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Additionally, the average latent class assignment probabilities were above .80 for all models except for the five and seven class model, which provides further support for rejecting these. This left models with two, three, and four classes. The BLRT was significant for all models and the entropy was acceptable for the two and four class models but not the three-class model, meaning the three-class model was also rejected. Although the two-class model would have been suitable as it has the lowest BIC value and a high entropy value, the four class model was chosen as the model of best fit as it was preferred by both the AIC and SSBIC values, in addition to also having an acceptable entropy value. Furthermore, the four-class model was easier to meaningfully interpret than the two class model.

Table 3

Model fit statistics and class sizes of latent class analysis (N = 557)

Number of classes	AIC	BIC	SSBIC	Entropy	BLRT	Class	N	%
1	6360.99	6425.83	6378.22	N/A	N/A	1	60	10.8
2	6252.19	6386.19	6287.78	.84	< .001	2	39	7.0
3	6189.96	6393.12	6243.92	.63	< .001	3	373	67.0
4	6151.16	6423.48	6223.49	.78	< .001	4	85	15.3
5	6137.53	6479.01	6228.23	.70	.002			
6	6131.14	6541.78	6240.21	.81	< .001			
7	6121.38	6601.19	6248.82	.84	.006			

Note. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, SSBIC = sample-size adjusted BIC, BLRT = Bootstrap Likelihood Ratio Test.

Description of Classes

Once the four-class model was chosen, the item probabilities for each class on all indicator variables was examined. These values demonstrate the likelihood of a member from a certain class to endorse an item, with values closer to 1 indicating a higher likelihood of endorsing that item and values closer to 0 indicating a lower likelihood. These probabilities

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

are demonstrated in in Figure 1, Figure 2, and Figure 3. Upon review of these probabilities, class one was labelled the Low-Level Underage (LLU) group, class two was labelled the General Sexual Deviance (GSD) group, class three was labelled the Medium-Level Child (MLC) group, and class four was labelled the High-Level Child (HLC) group.

Class 1 consists of 60 individuals and was labelled the LLU group. This is because they demonstrated low to medium levels of engagement and low levels of technical capability. Furthermore, they engaged in lower level CSEM charges, demonstrated by their high probability of engaging in possession but not distribution or production. Overall, they had a low probability of specifying gender or other paraphilic material in their search terms. Furthermore, their probability of searching for prepubescent material was nearly .05, indicating no strong preference for prepubescent or pubescent children, hence their interest likely lies in underage children in general. However, in comparison to other groups based on their item response probabilities, they were more likely than GSD and HLC groups to search for female victims, less likely than MLC and HLC groups to look for male victims and had a lower chance of looking for other paraphilic material when compared to the GSD group.

Class 2 was labelled the GSD group and consists of 39 individuals, thereby making it the smallest group out of all four. They demonstrated low levels of engagement and low to medium levels of technical capability. They were likely to engage in distribution, had a chance probability (approximately .05) of engaging in possession, but were unlikely to engage in production. Out of all four groups the GSD group is the most likely to engage in distribution. Overall, their likelihood of searching for a specific victim gender, prepubescent material, or other paraphilic material was low. However, compared to the other groups, the GSD group had the highest probability of searching for other paraphilic material and had the lowest probability of specifying a victim gender or prepubescent material.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Class 3 is the largest group ($N = 373$) and was labelled the MLC group. This is because they demonstrated medium levels of engagement and low to medium levels of technical capability. They were likely to engage in the possession and distribution of CSEM but not its production. Overall, they had a low probability of specifying a victim gender in their search terms, but when compared to the other groups they were the most likely group to search for female victims and the second most likely to search for male victims, after the HLC group. They also demonstrated a high probability of searching for prepubescent material and low probability of looking for other paraphilic material.

The fourth and final class was labelled the HLC group, which consists of 85 individuals. They demonstrated high levels of engagement and medium levels of technical capability. They were highly likely to possess and distribute CSEM, and unlikely to produce it. However, in comparison to the other groups, the HLC group demonstrated the highest probability of producing their own CSEM. Similar to the other groups, the overall probability of specifying a gender was low, but when compared to the other groups they were the most likely group to search for male victims and less likely than both the LLU and MLC groups to search for female victims. As with the MLC group, the HLC group also demonstrated a high probability of searching for prepubescent material and a low probability of searching for other paraphilic material.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

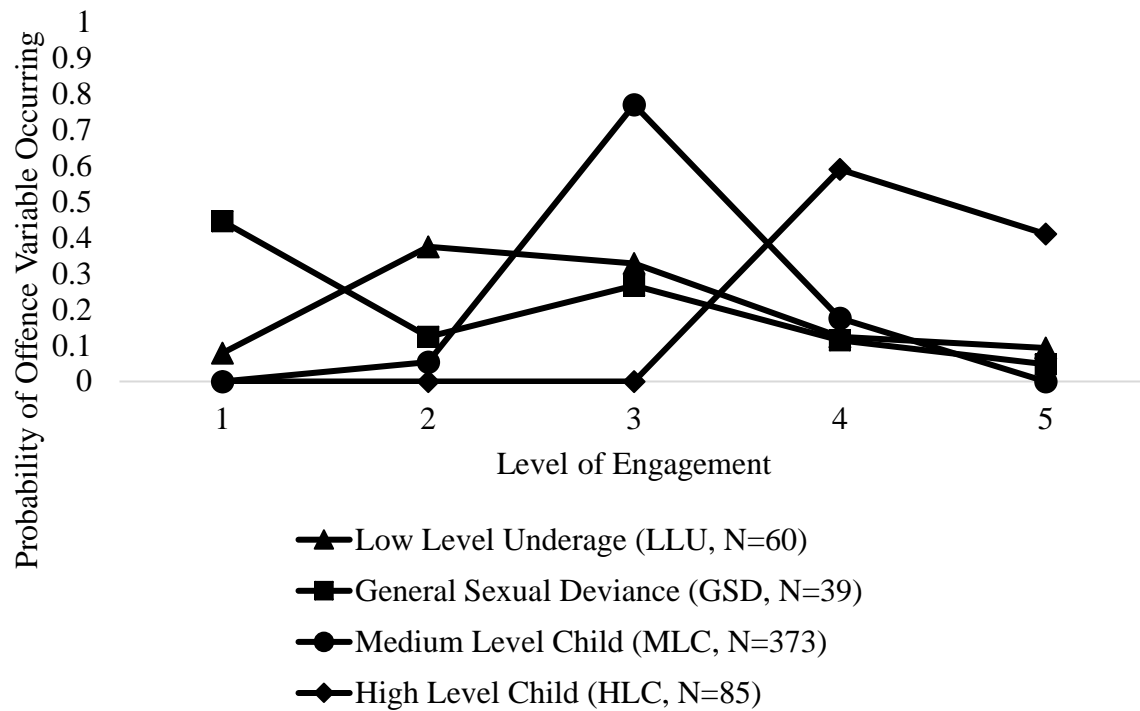


Figure 1. Probability of engagement levels occurring for each class.

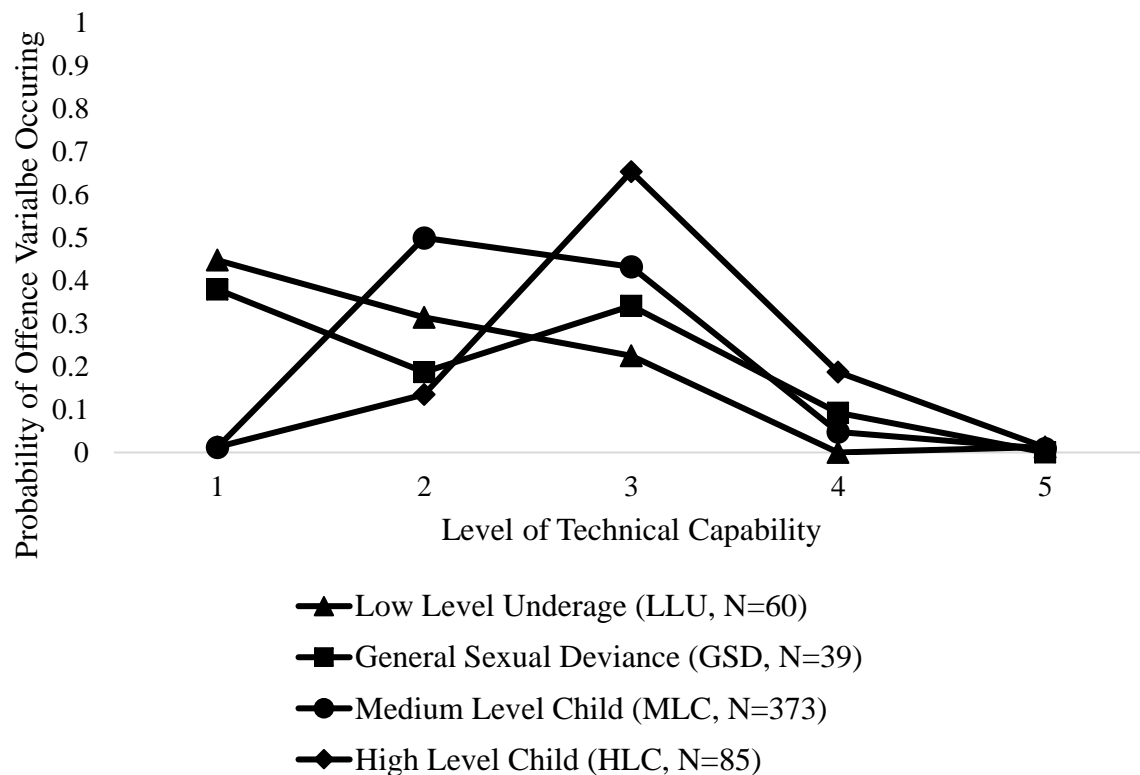


Figure 2. Probability of technical capability levels occurring for each class.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

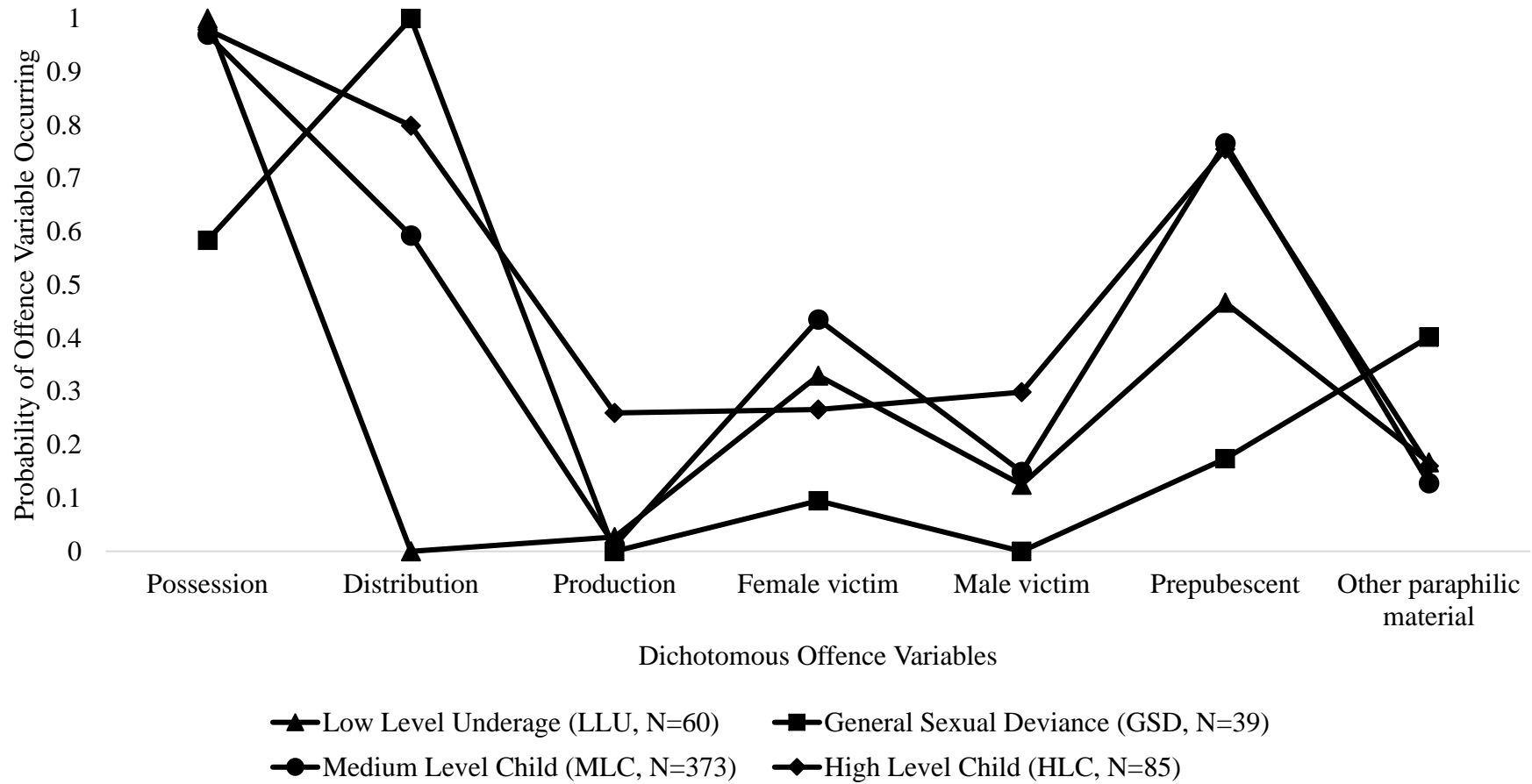


Figure 3. Probability of dichotomous offence variables occurring for each class.

Class Differences on Indicator Variables

To conduct post-hoc tests, all individuals were assigned to a group based on their most likely class membership. Then, in order to investigate whether the four classes differed significantly on the offence variables, seven chi square tests of independence were conducted for the seven dichotomous offence variables. All tests had sufficient expected cell frequencies of above five for at least 80% of cells (Field, 2013). The results of these chi square tests of independence are shown in Table 4, which found that the classes differed significantly on all seven variables, adding validity to the classes generated by the LCA. For interpreting the effect size based on the degrees of freedom, .01 is considered a small effect, .30 is considered a medium effect, and .50 is considered a large effect (Pallant, 2013). In order to ascertain which classes differed significantly on each variable, the column proportions of significant chi square tests were evaluated using a Bonferroni correction for multiple comparisons.

The chi square test for possession showed a statistically significant difference between groups, $\chi^2(3, N = 557) = 144.34, p < .001, \phi_c = .51$, with a large effect size. Evaluation of the column proportions showed that the LLU (100.0%), MLC (96.8%) and HLC (98.8%) all had higher percentages of possession charges when compared to the GSD class (51.3%). No statistically significant differences were found between the LLU, MLC, or HLC groups.

Differences in the distribution of CSEM also showed statistical significance and a relatively large effect size, $\chi^2(3, N = 557) = 131.74, p < .001, \phi_c = .49$. Column proportions indicated that statistically significant differences between all groups, with the highest percentage of individuals committing distribution offences in the GSD group (100%), followed by the HLC group (82.4%), the MLC group (57.1%), and none in the LLU group (0%).

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Similarly, differences in the production of CSEM also showed a statistically significant difference between groups with a medium effect size, $\chi^2(3, N = 557) = 113.31, p < .001, \phi_c = .45$. This demonstrated that the HLC group had notably higher rates of production (28.2%) compared to the LLU (1.7%), GSD (0.0%), and MLC groups (0.8%). No significant differences were found between the LLU, GSD, and MLC groups.

Search terms for female, $\chi^2(3, N = 557) = 32.25, p < .001, \phi_c = .24$, and male victims, $\chi^2(3, N = 557) = 25.07, p < .001, \phi_c = .21$, showed statistically significant differences between groups, both demonstrating small effect sizes. Column proportions for those searching for male victims indicated that more individuals in the HLC group searched for male victims (31.8%) compared to the MLC group (13.9%) and the GSD group (0.0%) but showed no difference to the LLU group (13.3%). No significant differences were found between the MLC, GSD, or LLU groups. Individuals in the MLC group searched more frequently for female victims (44.2%) than those in the HLC group (20.0%) and the GSD group (10.3%), and the HLC and GSD group showed no significant differences to each other. No statistically significant differences were found between the LLU group (30.0%) and the other groups.

Finally, both the chi square tests for differences in the use of prepubescent search terms, $\chi^2(3, N = 557) = 65.40, p < .001, \phi_c = .34$, and search terms for other paraphilic material $\chi^2(3, N = 557) = 15.73, p = .001, \phi_c = .17$, were significant, with medium and small effect sizes respectively. Percentages of those searching for prepubescent material was highest in the MLC (74.3%) and HLC (72.9%) groups compared to the GSD (15.4%) and LLU (50.0%) groups. The difference between the LLU and GSD groups was significant, whereas the difference between the MLC and HLC groups was not. Column proportions for the use of search terms for other paraphilic material revealed that more individuals in the GSD group used these search terms (38.5%) than the LLU (13.3%), MLC (14.2%), and the

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

HLC (16.5%) groups. No other statistically significant differences were found between the LLU, MLC, or HLC groups.

To evaluate whether groups differed significantly on technical capability and engagement, two Kruskal-Wallis tests were conducted, the descriptive statistics of which are displayed in Table 5. The Kruskal-Wallis test for engagement found a statistically significant difference between classes, $\chi^2(3, n = 556) = 256.21, p < .001$. Six post-hoc Mann-Whitney U tests were conducted to evaluate which groups differed significantly on their engagement levels, which are shown in Table 6. A Bonferroni correction of .008 was employed to account for Type 1 error when conducting multiple tests. This found that all groups showed statistically significant differences between each other. More specifically, results showed that the HLC group demonstrated the highest level of engagement ($Md = 4$), followed by the MLC group ($Md = 3$), then the LLU group ($Md = 2$), and GSD group with the lowest level of engagement ($Md = 1$).

The second Kruskal-Wallis test also revealed statistically significant differences between groups on their technical capability, $\chi^2(3, n = 556) = 132.67, p < .001$. Another six Mann-Whitney U tests were conducted to evaluate where the differences lie, again with a Bonferroni correction of .008 employed. These found significant differences between all groups on technical capability except between the LLU and GSD groups. Overall, this demonstrated that the HLC group demonstrated a higher level of technical capability ($Md = 3$), than the MLC and GSD groups ($Md = 2$) and the LLU group ($Md = 1$). However, the difference in technical capability between LLU and GSD groups was not significant. Like the chi square test results, these significant Kruskal-Wallis tests add validity to the classes generated by the LCA.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Table 4

Chi square test results for dichotomous indicator variables (df = 3, N = 557)

	LLU (N = 60) n (%)	GSD (N = 39) n (%)	MLC (N = 373) n (%)	HLC (N = 85) n (%)	χ^2	<i>p</i>	ϕ_c
Possession	60 (100.0) ^a	20 (51.3) ^b	361 (96.8) ^a	84 (98.8) ^a	144.34	< .001	.51
Distribution	0 (0.0) ^a	39 (100.0) ^b	213 (57.1) ^c	70 (82.4) ^d	131.74	< .001	.49
Production	1 (1.7) ^a	0 (0.0) ^a	3 (0.8) ^a	24 (28.2) ^b	113.31	< .001	.45
Female victim	18 (30.0) ^{abc}	4 (10.3) ^c	165 (44.2) ^b	17 (20.0) ^{ac}	32.25	< .001	.24
Male victim	8 (13.3) ^{ab}	0 (0.0) ^b	52 (13.9) ^b	27 (31.8) ^a	25.07	< .001	.21
Prepubescent victim	30 (50.0) ^a	6 (15.4) ^b	277 (74.3%) ^c	62 (72.9%) ^c	65.40	< .001	.34
Other paraphilic material	8 (13.3) ^a	15 (38.5) ^b	53 (14.2) ^a	14 (16.5) ^a	15.73	.001	.17

Note. Each subscript letter denotes a subset of classes whose column proportions do not differ significantly from each other at the $p < .05$ level (only indicated for variables with significant differences across groups, where $p < .05$).

LLU = Low Level Underage, GSD = General Sexual Deviance, MLC = Medium Level Child, HLC = High Level Child.

% = Percentage within class, ϕ_c = Cramer's V.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Table 5

Frequencies of engagement and technical capability ratings by class (N = 556)

Engagement	LLU (N = 60) n (%)	GSD (N = 39) n (%)	MLC (N = 372) n (%)	HLC (N = 85) n (%)
1	6	21	0	0
2	32	5	16	0
3	11	8	287	0
4	4	4	69	49
5	7	1	0	36
Technical capability				
1	36	19	1	1
2	14	5	192	7
3	9	11	160	59
4	0	4	16	17
5	1	0	3	1

Note. LLU = Low Level Underage, GSD = General Sexual Deviance, MLC = Medium Level Child, HLC = High Level Child.

Table 6

Mann-Whitney U test results for engagement and technical capability (N = 556)

	Mann-Whitney U	z	p	r
Engagement				
LLU and GSD	781.50	-2.90	.004	.29
GSD and MLC	3038.00	-7.56	<.001	.37
MLC and HLC	1690.50	-15.00	<.001	.70
LLU and MLC	5964.50	-7.10	<.001	.34
GSD and HLC	165.00	-8.51	<.001	.77
LLU and HLC	567.00	-8.33	<.001	.69
Technical capability				
LLU and GSD	947.50	-1.77	.08	.18
GSD and MLC	4941.50	-3.62	<.001	.18
MLC and HLC	8326.00	-7.58	<.001	.36
LLU and MLC	4203.50	-8.50	<.001	.41
GSD and HLC	746.50	-5.45	<.001	.49
LLU and HLC	503.00	-8.78	<.001	.73

Note. LLU = Low Level Underage, GSD = General Sexual Deviance, MLC = Medium Level Child, HLC = High Level Child.

Effect size of .10 is small, .30 is medium, and .50 is large (Cohen, 1988).

Class Differences on External Variables

To gain a more detailed understanding of the classes, six chi square tests of independence were conducted to see if classes differed according to external individual variables not included in the LCA, including employment, relationship status, access to children, previous sexual offending, previous CSEM offending, and previous other offending. All tests except for previous CSEM offending met the requirements of having an expected cell frequency above five for at least 80% of cells. As the previous CSEM offending variable did not meet this requirement, a Fisher-Freeman-Halton exact test of independence (an extension of Fisher's exact test for contingency tables larger than 2×2 ; Freeman & Halton, 1951) was adopted instead in order to account for this, which only provides a significance value. For chi square tests that were significant, the column proportions were examined in order to determine which class showed significantly different results using a Bonferroni correction. As with the chi square analyses for the indicator variables, effect sizes of .01 are considered small, .30 are considered medium, and .50 are considered large (Pallant, 2013). Finally, results of the ANOVA are presented here to evaluate group differences in age.

The results of the chi square tests found no significant differences between the classes in employment, $\chi^2(3, N = 557) = 1.93, p = .59, \phi_c = .06$; relationship status, $\chi^2(3, N = 557) = 4.67, p = .197, \phi_c = .09$; or previous other offending, $\chi^2(3, N = 552) = 1.12, p = .77, \phi_c = .05$, as shown in Table 7. However, significant differences in previous sexual offending $\chi^2(3, N = 552) = 41.18, p < .001, \phi_c = .27$; previous CSEM offending ($p = .001$, Fisher-Freeman-Halton test); and access to children, $\chi^2(3, N = 557) = 9.79, p = .02, \phi_c = .13$, were found. The effect sizes were medium for previous sexual offending and small for access to children.

As the chi square test for previous sexual offending was significant, the column proportions were examined to see which groups showed significant differences. This demonstrated that the HLC group (28.6%) and the LLU (16.9%) group both showed a

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

statistically significant higher percentage of previous sexual offending than the MLC group (6.7%) and the GSD group (0%). No significant differences between the LLU and HLC groups or between the GSD and MLC groups were found.

The column proportions for previous CSEM offending demonstrated that the HLC group showed a higher percentage of previous CSEM offending (16.7%) than the MLC group (3.8%). No other significant differences between groups were found.

The column proportions for access to children revealed that more individuals in the HLC group had access to children (54.1%) than those in the LLU group (31.7%). No other significant differences were found.

Finally, in order to ascertain whether age differed significantly across the classes, a one-way ANOVA was conducted. This found that age did differ significantly across classes, $F(3, 553) = 3.60, p = .01$. Although a significant difference, the effect size calculated using eta squared (.02) revealed that this difference is quite small. A Games-Howell post-hoc test was employed to see how age varied across the classes. This test was used because it accounts for unequal sample sizes and unequal variance (Field, 2013). This found that age was statistically different only between the LLU ($M = 41.55$) and MLC ($M = 35.55$) groups. No other statistically significant differences were found between these groups or the GSD ($M = 38.31$) and HLC ($M = 37.88$) groups.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Table 7

Chi square test results for external individual variables (df = 3, N = 557)

	LLU (N = 60) n (%)	GSD (N = 39) n (%)	MLC (N = 373) n (%)	HLC (N = 85) n (%)	χ^2	p	ϕ_c
Employment	46 (76.7)	33 (84.6)	299 (80.2)	64 (75.3)	1.93	.59	.06
In a relationship	14 (23.3)	15 (38.5)	90 (24.1)	18 (21.2)	4.67	.20	.09
Access to children	19 (31.7) ^a	12 (30.8) ^{ab}	160 (42.9) ^{ab}	46 (54.1) ^b	9.79	.02	.13
Previous sexual offending*	10 (16.9) ^a	0 (0.0) ^b	25 (6.7) ^b	24 (28.6) ^a	41.18	< .001	.27
Previous CSEM offending*	3 (5.1) ^{ab}	1 (2.6) ^{ab}	14 (3.8) ^b	14 (16.7) ^a	N/A	.001	N/A
Previous other offending*	7 (11.9)	4 (10.5)	32 (8.6)	6 (7.1)	1.12	.77	.05

Note. Each subscript letter denotes a subset of classes whose column proportions do not differ significantly from each other at the $p < .05$ level (only indicated for variables with significant differences across groups, where $p < .05$).

LLU = Low Level Underage, GSD = General Sexual Deviance, MLC = Medium Level Child, HLC = High Level Child.

% = Percentage within class, ϕ_c = Cramer's V.

*Due to missing data, these variables have different group sizes (LLU = 59, GSD = 38, MLC = 371, HLC = 84).

Discussion

The current study aimed to develop an exploratory, empirically derived typology of child sexual exploitation material offending in New Zealand using offence and individual characteristics that were used in existing typologies or found to be important in previous studies. The results of the LCA identified four distinct groups: LLU, GSD, MLC, and HLC. Results showed that the groups differed on all offence characteristics and on some of the external individual variables. The findings of this study are described in detail below, followed by an interpretation of the findings, limitations, and implications for practice and future research.

Summary of Results

LLU group results. The LCA showed that the LLU group offends at a lower level of severity, indicated by their low to medium levels of engagement, low technical capability, and lower level CSEM charges. More specifically, they were likely to possess CSEM but not distribute or produce it. Furthermore, their likelihood of specifying a specific gender or other paraphilic material was low, whereas they had a nearly 50% chance of searching for prepubescent material. Those who did not, either searched for pubescent material (those aged 14 to 17) or did not specify an age, indicating that this group is interested in underage material in general, and not necessarily prepubescent children.

The post-hoc tests showed that the LLU group had the second lowest level of engagement and the lowest level of technical capability (alongside the GSD group). Everyone in the LLU group possessed material, which was significantly higher than for the GSD group but the same as the MLC and HLC groups. No one distributed material, which was significantly lower than all other groups, and only 1.7% produced their own material, which was significantly lower than the HLC group but not different to the other groups. Furthermore, a small proportion of individuals searched for male victims or other paraphilic

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

material (just over 13%), whereas nearly a third searched for female victims and half searched for prepubescent material. Post-hoc tests also showed their likelihood of searching for a specific gender was not different to any of the other groups, whilst they were less likely than the GSD group to search for other paraphilic material and less likely than the HLC and MLC groups to search for prepubescent material. In terms of the external variables, nearly a third of individuals in the LLU group had access to children, nearly 17% had committed previous sexual offences, and 5% had committed previous CSEM offending. Post-hoc tests showed the LLU group's access to children was significantly less than the HLC group, but they had similar levels of previous sexual offending, which were more than both the GSD and MLC groups. No differences to the other groups were found for their previous CSEM offending.

GSD group results. The GSD group was the smallest group and was characterised by the LCA as being likely to demonstrate low engagement and low to medium technical capability, whilst having a high probability of engaging in distribution, a low probability of engaging in production, and a chance probability of engaging in possession. It also characterised them as having a low probability of specifying a specific gender, prepubescent, or other paraphilic material.

Post-hoc tests revealed that they demonstrated the lowest levels of technical capability and engagement out of all the groups. Just over half of individuals in the GSD group possessed material, which was significantly lower than all other groups, whilst everyone engaged in its distribution, which was highest out of all the groups. No one in this group engaged in its production, and this was lower than the HLC group but not different to the LLU or MLC groups. Furthermore, just over 38% of individuals in the GSD group searched for other paraphilic material, which was significantly higher than any of the other groups. No one in the GSD group searched for male victims and just over 10% searched for female

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

victims, which was significantly lower than those in the MLC group. Furthermore, just over 15% searched for prepubescent material, which was the lower than all other groups. Finally, in terms of their external individual variables, no one in the GSD group had committed previous sexual offences, which was significantly less than the HLC and LLU groups. Furthermore, one person had committed a previous CSEM offence and just over 30% had access to children, but no significant differences were found when compared to the other groups.

MLC group results. The MLC group is the largest group, making up nearly 70% of the entire sample. Results of the LCA indicated this group was likely to demonstrate medium levels of engagement and low to medium levels of technical capability. They were likely to engage in possession and distribution but not production. In their search terms, they were likely to search for prepubescent material but were unlikely to search for other paraphilic material or a specific victim gender.

Post-hoc tests revealed that the MLC group demonstrated the second highest level of technical capability (alongside the GSD group) and engagement. Nearly everyone in this group possessed CSEM (97%), which was similar to the LLU and HLC groups but more than in the GSD group. Furthermore, the MLC group was the third least likely to distribute material (just over 57% of the group) and, together with the LLU and GSD groups, was the least likely to produce their own material (0.8%). In their search terms, approximately 75% searched for prepubescent material, which was the highest out of all groups alongside the HLC group. Just over 44% searched for female victims which was more than those in the HLC or GSD groups and 13.9% searched for male victims, which was less than the HLC group and similar to those in the other groups. Furthermore, just over 14% searched for other paraphilic material, which was less than those in the GSD group and similar to the other groups. In terms of their external variables, 6.7% had engaged in previous sexual offending

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

which was significantly lower than the HLC and LLU groups, and 3.8% had committed previous CSEM offending, which was significantly lower than the HLC group. Finally, nearly 43% of individuals had access to children but this was not significantly different to the other groups.

HLC group results. Finally, the HLC group is the second largest group. The LCA revealed that they had a high likelihood of demonstrating high levels of engagement and medium levels of technical capability. They were also likely to possess and distribute CSEM, but not to produce it. Additionally, they were likely to search for prepubescent material but unlikely to search for other paraphilic material or specify a specific victim gender.

Post-hoc tests revealed that nearly all individuals in this group possessed and distributed material, and just over a quarter produced their own. Out of all groups, they were the most likely to produce CSEM and the second most likely to distribute it. Their rate of possession did not differ to the MLC and LLU groups, but it was higher than the GSD group. In their search terms, 20% searched for female victims, which was less than the MLC group, and nearly 32% searched for male victims, which was more than the MLC and GSD groups. Additionally, nearly 73% searched for prepubescent material, which together with the MLC group was higher than the GSD and LLU groups. Nearly 17% searched for other paraphilic material, which was less than the GSD group but similar to the MLC and LLU. Finally, in terms of their external variables, approximately 54% had access to children, which was higher than those in the LLU group. Nearly 29% had also committed previous sexual offences which was more than for those in the GSD or LLU groups, and similar to those in the LLU groups. Furthermore, 16.7% had committed previous CSEM offences, which was more than those in the MLC group.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Interpretation of the Results

Overall, the findings indicate that there are important within-group differences of individuals who engage in CSEM offending. The results show that there are three groups with a focussed interest in underage material that show a trend in escalation from low, medium, to high level offending. The fourth group (GSD) appears to be an outlying group that is more likely to be searching for sexually deviant material in general, such as bestiality or urination, in addition to CSEM.

Firstly, the LLU group is a low-level group that engages in the least severe form of CSEM offending. Their CSEM offending appears to be motivated somewhat by a sexual interest or curiosity in underage material in general, as half of individuals in this group searched for prepubescent material and the other half searched for either pubescent material or did not specify an age. The MLC and HLC groups appear to be an intensification of the LLU group, as both groups demonstrate a more specified interest in prepubescent children and an escalation in the type of offending and their levels of engagement and technical capability. This suggests that these categories are dynamic and that individuals can move across these groups as they become more involved with the material and start to refine their sexual interests, as demonstrated by the Problematic Internet Use model (Quayle & Taylor, 2003). For instance, individuals could start at the LLU group where they possess CSEM, and once they become more involved start to distribute and produce their own material and become more specific in their search terms. Conversely, Fortin and Proulx (2019) argue that for some individuals their engagement in CSEM offending is motivated out of curiosity, and that after exploring the material may come to the decision that they are not interested in this kind of material and will move to adult content, which may reflect LLU individuals who do not progress onto the more severe groups (e.g. MLC and HLC).

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

The increase in distribution across these three groups not only suggests an increase in the severity of offending but may also be an indication of increased socialisation with others online, as they may be trading with others to interact in the online community and collect new material. This again suggests a progression in the groups from starting out as an isolated collector to becoming a more social collector and trader for whom belonging and status in the online CSEM community is important. The higher likelihood of producing CSEM in the HLC group may also be associated with this socialising component, as producing original material provides status and credibility in the community due to being able to trade rare content (Jenkins, 2001).

Overall, New Zealanders engaging in CSEM offending are most likely to demonstrate characteristics of the MLC group. That is, moderate levels of engagement and technical capability, an interest in prepubescent girls, and engagement in possession and distribution. Furthermore, the finding that the MLC group, who made up the largest proportion of individuals engaging in CSEM in New Zealand, had lower rates of previous sexual offending compared to the LLU and HLC groups fits with current research that has found that the majority of detected individuals who have engaged in CSEM offending do not have a recorded previous sexual offence (Eke et al., 2011; Elliot et al., 2009). They appear to be a step down from the HLC group as demonstrated by their offence characteristics and their reduced likelihood of having committed previous sexual and CSEM offences.

Although the current typology was not intended to be a risk typology, some of the characteristics suggest that the HLC group may be at a higher risk for mixed offending and more likely to be recidivists. Firstly, this group was more likely to search for male victims and engage in the production of CSEM. Research suggests that individuals who produce their own material and have more material depicting male victims are more likely to be engaging in mixed offending (Seto & Eke, 2011; McManus et al., 2015). A greater sexual interest in

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

male children has also been identified as a risk factor in populations engaging in contact sexual offending (Seto, 2008). Furthermore, they have more access to children, which has been found to distinguish individuals engaging in CSEM from those engaging in mixed offending (Babchishin et al., 2015), and they engage in more previous sexual offending and previous CSEM offending than most other groups, variables which have been identified as important risk factors for this population (Seto & Eke, 2015). This suggests that they may be the highest risk group who may require greater resource allocation in an investigative context and greater therapeutic responding.

The GSD group, however, appeared significantly different from the aforementioned three groups. They appeared to be accessing CSEM out of an interest in general sexual deviant material, as they tended to search for additional paraphilic material, but were unlikely to search for prepubescent material or a specific victim gender. This suggests that they are engaging in nonspecific viewing of CSEM that might not be driven by a sexual interest in children. Fortin and Proulx (2019) argue that when individuals become habituated to pornography of a low severity, they will begin to seek out new, more severe content out of boredom and to elicit the same arousal response, which may reflect the process that the GSD group is engaging in. Furthermore, Fortin, Paquette, and Dupont (2018) state that individuals who are seeking new material need to engage in distribution offending in order to gain access to it, which may explain why everyone in the GSD group engaged in distribution offending, and did so significantly more than all other groups. In addition, the existing literature also suggests that some individuals collect CSEM as they gain satisfaction from collecting and organising it (Quayle & Taylor, 2003). Although a rough indicator, the GSD group's focus on distribution rather than possession could suggest that this group is not focussed on collecting the material like many individuals engaging in CSEM are. This again supports the idea that

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

rather than collecting old material, their focus is on trading with others to get new material that suits their general deviant sexual interests.

In addition, the GSD group had the lowest levels of technical capability and engagement and no one had engaged in previous sexual offending, suggesting that they are on the lower end of severity than compared to other groups such as the HLC group. Furthermore, as this group is the smallest group and because offences involving material of other illegal sexual content (e.g., bestiality) is less common than CSEM (Carr, 2006), this suggests that the GSD group may be relegated in terms of resource allocation in an investigative context, as resources would need to be prioritised for common groups or those who present with more severe offending behaviours, such as the MLC and HLC groups.

In addition to the significant differences found between groups, there were also some variables that were not found to significantly differentiate between the groups, including relationship status, employment, and previous other offending. This is because most of the sample were single, employed, and with no offending history, which fits with the findings of previous research (Aslan & Edelmann, 2014; Babchishin et al., 2011; Babchishin, et al., 2015; Bates & Metcalf, 2007; Eke et al., 2011; Elliot et al., 2009; Faust et al., 2014; Howitt & Sheldon, 2007; McManus et al., 2015; Seto et al., 2012; Webb et al., 2007). Furthermore, age did not appear to be an important differentiating factor. Although previous research has found these variables important to differentiate between those who have committed CSEM offending and those who have committed CSO or mixed offending (Aslan & Edelmann, 2014; Babchishin et al., 2011; Babchishin et al., 2015; Bates & Metcalf, 2007; Faust et al., 2014; Howitt & Sheldon, 2007; McManus et al., 2015; Seto & Eke, 2015; Seto et al., 2012; Webb et al., 2007), these findings suggest that these variables are not helpful for distinguishing within-group differences of individuals who have committed CSEM offences. Although some individuals in this sample had engaged in mixed offending, these variables

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

did not differentiate this group from the CSEM group, which may be due to there being no difference or that the number of individuals who had engaged in mixed offending was too small to detect a significant relationship.

Although important, significant differences were found between groups on their likelihood of searching for other paraphilic material or a specific victim gender, all groups had a relatively low probability of doing so according to the LCA. This suggests that overall, individuals in New Zealand who engage in CSEM offending are not looking for other types of paraphilic material and tend not to search for a specific victim gender. However, as most CSEM that exists is of female children (Bunzeluk, 2009; Carr, 2004; Internet Watch Foundation, 2016; Steel, 2009; Wolak et al., 2005; Wolak et al., 2011), the low probability of specifying a gender could reflect the fact that individuals who prefer female children do not need to specify this in their search terms because most material that they find will be of female children regardless.

Comparisons with Previous Typologies

Several comparisons can be made between the current study and the groups identified in the study by Merdian (2012). Firstly, some characteristics of Merdian's Contact-driven Users group can be compared with those of the LLU group, in that they both demonstrated low levels of engagement, low technical capability/safe-keeping, did not distribute their material with others, and were unlikely to search for or possess material depicting paraphilic content. However, the main characteristic that distinguished Merdian's Contact-driven Users group is that most individuals in the group had engaged in CSO, which contributed to Merdian's distinction between contact-driven and fantasy-driven CSEM offending. Conversely, none of the groups in the current study demonstrated high rates of previous sexual offending, suggesting that the contact-driven and fantasy-driven distinction is not easily applied to these groups. It is important to consider that this finding may also be

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

impacted by the fact that the current study used official statistics, whereas Merdian's study included self-report data, meaning that the current study may be underreporting the number of individuals also engaging in CSO.

Merdian's (2012) second largest group, Fantasy-driven Users, also share some similarities with the MLC group in the current study, in that both groups demonstrated medium levels of engagement and methods of hiding their material, low levels of contact sexual offending, and a low likelihood of demonstrating a preference for male victims. However, they differ in the fact that Fantasy-driven Users did not tend to share material with others, whereas those in the MLC group were likely to engage in the distribution of material. Furthermore, Extreme Material Users in Merdian's study possessed more extreme material than other groups, shared files with other users, and did not engage in contact sexual offending, which is comparable to the GSD group in the current study. However, Extreme Material Users were identified to have a clear victim preference, whereas this was not demonstrated by the GSD group. Finally, Social Users and Cautious Users can be compared to the HLC group, as Social Users demonstrated high levels of engagement and file sharing, and Cautious Users used various methods of hiding their material, all characteristics that were demonstrated by the HLC group. However, Cautious Users demonstrated a preference for male victims, whereas those in the HLC groups, although demonstrating higher rates of search terms for males than most other groups, indicated that only a third of the group explicitly searched for male victims.

As discussed, the groups in the current study share many similarities with the groups identified in Merdian's (2012) study, which provides some support for Merdian's findings, and, in turn, her model for the classification, assessment, and treatment of these individuals. Given the dearth of replication studies, this finding is hugely informative for the CSEM field. Although Merdian's study supports a two-fold distinction between contact-driven and

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

fantasy-driven CSEM offending, the current study supports the idea of an escalation of severity of offending across groups. This difference could be due to the fact that the current study used a much larger sample size and was therefore able to detect gradual increases in the severity of offending behaviours. However, the current study was unable to assess whether individuals possessed fantasy-generating material or how much they engaged socially with other CSEM users, meaning that the two-fold distinction may be applicable in this sample but was unable to be captured, pointing to an area of future research.

Next, the classes in Krone's (2004) typology escalated in terms of their involvement, networking, and security level. This is consistent with the findings of the current study, in that the level of engagement, technical capability, and type of CSEM offence escalated in the LLU, MLC, and HLC groups. Furthermore, although networking was not able to be directly assessed, the fact that the engagement in distribution offending increased across the groups could be a rough indicator of increased networking, as individuals often interact with others to distribute material in order to trade and collect rarer images.

When comparing Krone's categories to the groups in this typology, both the LLU and GSD groups can be considered non-secure collectors, as they do not demonstrate high levels of technical capability. The MLC and HLC groups can therefore be considered secure collectors, as they demonstrated moderate use of security measures. The GSD group can also be considered similar to Krone's trawler group, where individuals collect wide ranges of pornography and engage in CSEM offending out of curiosity. Furthermore, Krone's private fantasy group could be applied to the LLU, MLC, and HLC groups. The private fantasy group are those who fantasise about children and seek out CSEM. The characteristics of the three groups in this typology suggests a sexual interest either in prepubescent children or underage children, as demonstrated by their search terms. However, this private fantasy group is conceptualised as an indirect abusers group who do not engage in contact sexual

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

offending, whereas a significant proportion of those in the HLC and LLU group had also previously committed sexual offences.

Although some support for Krone's typology can be found, the fact that many of the groups in the current typology map on to multiple groups in Krone's typology highlights that Krone's typology has too many categories with too much overlap that makes it difficult to classify individuals. Furthermore, his categories of physical abuser (those for whom CSEM is supplementary to their contact offending either for fantasies or as a record of their offending) and producer (those who produce and distribute CSEM) are difficult to assign in this case as it is unknown if CSEM was used for fantasies or to record their own offending, and as no group was characterised as being a producer due to the overall low prevalence of production in this sample. Other groups such as browsers, groomers, and distributors are also unable to be compared here due to insufficient information in the current typology.

Although individuals' motivations for engaging in CSEM offending were not directly measured in this study, some tentative comparisons can be made to previous typologies that focussed on motivations. Firstly, Lanning's (2001) typology differentiates between situational offenders who access CSEM on a one-off basis due to impulsivity, curiosity, sexual gratification, or to earn money, and preferential offenders who access it repeatedly and have either paedophilic or generally deviant sexual interests. Here, the LLU and GSD groups can be conceptualised as situational offenders and the MLC and HLC as preferential offenders, particularly as Lanning states that preferential offenders have developed better technical capability. However, the GSD group could also be classified as preferential due to showing more of an interest in deviant sexual material in general. This highlights similar concerns as those for Krone's (2004) typology, as some of Lanning's groups overlap which make classification more difficult.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

As discussed previously, Beech et al. (2008) identified four groups of individuals engaging in CSEM offending: (1) periodically prurient individuals who access CSEM sporadically and who may be interested in pornography in general and not necessarily children, (2) fantasy-only individuals who engage in CSEM offending driven by a sexual interest in children but do not engage in CSO, (3) direct victimisation individuals who use CSEM and engage in solicitation offending to facilitate contact sexual offending, and (4) commercial exploitation individuals who engage in CSEM offending to earn money. Evaluation of the current typology to these categories suggest that the LLU and GSD groups fit mostly into the periodically prurient category, whilst the MLC and HLC groups' interest in prepubescent material suggests they are best suited for the fantasy-only category. The remaining two groups of Beech et al.'s typology are unable to be evaluated in this case as it is unknown whether individuals in this sample were financially motivated or if they were engaging in CSEM to facilitate contact sexual offending.

Overall, comparisons to previous typologies reveal that the groups in the current study are similar to those in Merdian's (2012) study, providing support for her classification system. In addition, the current typology includes a wide variety of offence and individual characteristics which are not captured when comparing them with those in some previous typologies, highlighting the rich level of description the current typology provides. The inability to assess some categories from previous typologies such as financial motivation or whether they were fantasy-driven or contact-driven points to areas for future research to provide a deeper understanding of these groups and begin to inform forensic practice.

Mapping the Typology onto the Problematic Internet Use Model

Certain characteristics of the LLU, MLC, and HLC groups can be considered according to the Problematic Internet Use model developed by Quayle and Taylor (2003). As discussed earlier, this model posits that there are distal and proximal setting events, coupled

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

with the disinhibition, availability, and anonymity of the Internet that relate to an individual's problematic cognitions and use of the Internet, resulting in spending more time online and increasing their technical capabilities. This then results in feelings of power because they can find new material, use better security measures, and interact with others. Their Internet use is then further maintained when they move from being an isolated collector who just downloads material to someone who joins the community component of CSEM offending, ultimately resulting in five different types of CSEM offending.

Some characteristics of the LLU, MLC, and HLC can be considered in the context of this model. The LLU group can be conceptualised at the less severe end of the Problematic Internet Use model, as they demonstrate low technical capability and engagement and tend to only engage in possession offending. This suggests that they do not spend as much time on the Internet to have developed better technical skills and are more likely to be isolated collectors rather than engaging in the social component of CSEM offending, as this is often accompanied by distribution offending because trading forms an integral part of the social component of CSEM offending. The MLC and HLC groups, however, appear to be escalating in their problematic Internet use, as they demonstrate higher levels of engagement and technical capability. Furthermore, they engage in more severe types of CSEM offending that suggest an increased involvement in the social component of CSEM offending, such as distribution and production, where production also aids in trading with others as trading new material will provide them with more status and credibility in the CSEM community.

This demonstrates that some characteristics of the new typology support the idea of an escalation of problematic Internet use in this offending population, resulting in being more engaged with the material, using better security measures, and engaging in more severe offending that is indicative of more social interaction with others also engaging in CSEM offending. Furthermore, research has also found support for other aspects of this model, such

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

as the presence of problematic cognitions associated with their Internet use. For instance, a study by Merdian et al. (2014) found that those who have engaged in CSEM offending are more likely to endorse cognitive distortions that are unique to the CSEM offending environment, such as 'Just looking at a naked child is not as bad as touching and will probably not affect the child as much' than those who have engaged in CSO or mixed offending. A point for future research could evaluate whether the endorsement of cognitive distortions, in addition to other aspects such as their socialisation online, increases as their problematic Internet use escalates, to further evaluate this model and provide a more detailed understanding of the groups identified in this typology.

Implications

The findings of the current research have several implications. Firstly, as discussed in detail above, the current typology provides some support for the Problematic Internet Use model developed by Quayle and Taylor (2003). Taking the online environment into consideration for understanding CSEM offending provides support for the idea that alternative approaches to assessment and treatment are required for this offending population. Indeed, this has been recognised by many researchers (Middleton, Mandeville-Norden, & Hayes, 2009; Merdian et al., 2013), and rehabilitation programmes such as the Internet Sex Offender Treatment Programme in England and Wales (Middleton et al., 2009) have begun to incorporate aspects of this into the programme. For example, they work to understand how the online community of other individuals engaging in CSEM offending meets their needs, and how they can meet their needs in a more appropriate way.

Additionally, Merdian, Perkins, Dustagheer, and Glorney (2018) developed a case formulation model for those engaging in CSEM offending, and the Internet environment and online behaviour forms an important consideration to begin to understand the causal mechanisms for this behaviour. More specifically, they argue that the unique environment of

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

the Internet acts as a situational facilitator for CSEM offending, especially due to the lack of supervision provided in this environment. They identify two important subthemes in this area, including the nature of the Internet, whereby individuals experience a sense of detachment from the real world and feel like a different person online than in their normal life, and the online behaviours they engage in (e.g., collecting, chatting with other collectors) and the psychological meanings behind these behaviours (e.g., to connect with others online, to save images that contribute to their fantasies). Not only does this case formulation model account for the situational influence that the Internet can have, but it also acknowledges that various online behaviours serve different functions for individuals, highlighting the importance of the inclusion of offence-specific variables in the current typology. This formulation and the groups identified in this typology highlight that these behaviours need to be considered in forensic and clinical practice in order to engage in comprehensive case formulation and begin to understand the aetiology of their offending.

Furthermore, the findings of this research have implications for organisations involved in the detection of individuals engaging in CSEM offending, such as the CCU at the DIA. For departments like the CCU, resources are limited due to the high number of individuals engaging in this behaviour and the high number of tip offs from other organisations and the public. Therefore, having an overview of the various groups within this population and their behavioural and individual characteristics may help to guide allocation of resources. For instance, if an individual presents with characteristics of the HLC group, such as having a high engagement with material, demonstrating a preference for male children, and using better security measures, authorities may be more inclined to escalate the matter beyond a formal warning, as this group are more likely to engage in repeat CSEM offending and present as a higher risk group overall.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Limitations

There are several limitations to the current study that need to be taken into consideration. Firstly, as with nearly all studies involving individuals who have engaged in CSEM offending, the main limitation is that the research was conducted on individuals who have been identified by authorities. As discussed by Seto (2013), there are likely to be important group differences between detected and undetected individuals. This is ameliorated to a degree in the current study in that it used a sample of individuals who have been detected but not necessarily convicted or imprisoned. This means that it is a wider sample that is more representative of the CSEM offending population than studies who use only those who have been convicted and sentenced, as cases that proceed to conviction and sentencing are likely to be more severe than those who result in a warning. However, the selection bias discussed by Seto is still relevant here. For instance, the finding that none of the groups in the typology scored highly on technical capability reflects the fact that the sample are detected individuals, as those who score highly on technical capability are less likely to be detected by the DIA. Furthermore, the selection bias is also reflected in the group sizes. The LLU and GSD groups are the smallest groups whilst MLC and HLC are the largest groups, which makes sense, as the higher the level of engagement and the more CSEM offence types they engage in, the higher their likelihood of being detected.

A further limitation in this study is that there are several behaviours that have been identified as important in the CSEM literature but were unable to be included in the typology as this information was not in the data set. Firstly, the social component of CSEM offending has been identified as important, as interacting with others not only provides individuals with information on how to hide their offending or gain new material, but trading with others and sharing new material is also a way for individuals to gain credibility and status within the CSEM community (Merdian, 2012; Quayle & Taylor, 2003). However, this was unable to be

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

directly examined in the current study. Furthermore, research has also highlighted that some individuals engage in CSEM offending to earn money or because they regard it as a collectible, rather than being motivated out of sexual interest (Taylor & Quayle, 2003), but this was also unable to be included in the typology. However, the Ministry of Justice (2012) reports that in New Zealand, it is rare for individuals to engage in CSEM offending to earn money. Nonetheless, this points to an avenue for future research that can evaluate differences between groups in the extent to which they socialise with others online and gain satisfaction from collecting the material, rather than gaining sexual satisfaction from the material itself.

In addition, there are some limitations of the variables that need to be considered when interpreting the results. Firstly, as discussed previously, levels of technical capability in this study are likely to be biased as individuals who have high technical capabilities are less likely to be detected by DIA and are therefore less likely to be included in the sample. Furthermore, as this data set spans over more than two decades, levels of technical capability are also likely to be affected by the fact that as computer technology is becoming more commonplace, society's technical capabilities as a whole would have increased too, especially as there is a heightened awareness of online security issues likely resulting in more individuals using more secure methods online. Therefore, the results of technical capability must be interpreted with some caution, as these two points likely mediate at least some of the findings regarding the levels of technical capability observed in the groups.

Future Research

The typology developed here helps to address some of the key gaps in the current literature surrounding the lack of empirically developed typologies of individuals who engage in CSEM offending. An important next step for future research would be replication, as the ability to replicate results is necessary in order to identify whether the observed findings are robust and reliable (Martin & Clarke, 2017). As the findings of the current study provide

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

some support for Merdian's (2012) study, who also used a sample from New Zealand, it is necessary for this typology to be replicated using a sample not from New Zealand to evaluate whether these findings can be generalised to CSEM offending overseas. In addition, further research into the risk of these groups and the differences in their psychological characteristics and causal mechanisms for their offending behaviour would help to guide assessment and treatment approaches for this population.

As too many variables in a LCA make the model too complex (Mundy, 2016), strict criteria were adopted in the inclusion of variables, which meant they needed to have sufficient variability in the data and support in the literature to warrant their inclusion. This meant that there were some variables provided in the data set which were unable to be used, however would be useful to examine in future research. For example, sentencing outcomes were unable to be included but would be useful in future research. This variable was provided in the data set but was unable to be used due to the changes in sentencing for CSEM offending over the 1996 to 2018 time period that the data set spans across (Films, Videos, and Publications Classifications Act 1993). This variable was therefore not included because any differences in sentencing outcomes between groups would be difficult to draw definitive conclusions from, as it would be unknown whether observed differences were due to actual differences between groups, the time period they were sentenced in, or other variables that influence sentencing, such as having enough evidence or submitting early guilty pleas (Ministry of Justice, 2012). Furthermore, including it in the typology would have made future replication with other samples impossible due to the differences in jurisdictions. However, sentencing outcomes would be an interesting direction for future research in order to ascertain which groups are more likely to get longer sentences or custodial sentences over non-custodial, which may point to differences in risk or severity of offending behaviour.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Finally, although the engagement in the distribution of CSEM was used as a rough indicator of their level of socialising online, it would be beneficial for future research to examine group differences in socialising with others using more accurate variables, such as whether they chat to others online, are part of an online collector group, etc. This would help to identify whether socialisation indeed increases across the groups, as suggested by the current typology and by Merdian (2012), which would help to further validate the classes generated in this typology. In addition, it would be beneficial to investigate the extent to which individuals in these groups possess fantasy-generating material. This, in combination with a better understanding of their socialisation with others online, would help to further understand whether a fantasy-driven or contact-driven distinction exists in this population. Moreover, it would provide a more comprehensive understanding of the environmental context of this offending behaviour.

Conclusion

This study developed an empirically derived typology of offence and individual characteristics of individuals who have engaged in CSEM offending to address some of the limitations in the current literature and form an understanding of the heterogeneity inherent within this population. This study demonstrates that individuals can be classified into four unique groups. Three of these groups showed a specific interest in child material (LLU, MLC, and HLC), who presented with an escalation across the groups in their level of engagement, technical capability, severity of charge type, and their specificity of search terms, supporting the idea of escalating problematic Internet use across this population. The group at the severe end (HLC), also demonstrated higher rates of previous CSEM and sexual offences, in addition to greater access to children, indicating that this group may present as a more chronic and higher risk group that may require greater resource allocation in an investigative context, as well as highlighting areas of future research to formally investigate

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

the differences in risk across the groups. The final group (GSD) was an outlying group characterised by an interest in deviant sexual material in general, as well being the most likely to engage in distribution, suggesting that they may be seeking deviant sexual material due to a habituation to lower severity, legal pornography, and engaging in distribution in order to source this material. The findings of this study have implications for assessment, in that the HLC group presented with characteristics associated with higher risk of future CSO and CSEM offending, and for treatment, as it provides information on offence and individual variables which may be incorporated into case formulation to provide a more comprehensive understanding of the role that individual differences and online behaviour have on the course of CSEM offending. Further research is required to validate the groups generated in this typology and gain a better understanding of their risk and rehabilitative needs.

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CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Appendices

Appendix A: Summary of Typologies

Typology focus	Author(s)	Description
Offence type	Alexy et al. (2005)	Traders: collect and distribute CSEM. May be charged with production, possession, and/or distribution. Travellers: Solicit children online and meet up with them in real life. Trader-travellers: engage in both CSEM offending and travelling to meet up with a child for sexual interactions.
	Durkin (1997)	Four ways individuals with paedophilic interests can misuse the Internet: 1. To traffic CSEM 2. To locate children to commit CSO against 3. To interact in a sexually inappropriate way with children 4. To network with others who share the same interest in children.
	McLaughlin (2000)	Travellers: contact-driven, use the Internet to groom potential victims. Collectors: collect and trade CSEM but do not engage in CSO. Manufacturers: produce CSEM for distribution, may engage in CSO. Chatters: collect child erotica and chat with victims online.
Offence characteristics	Carr (2006)	Group differences in objectionable publication offenders depending on their preferred Internet application. No preference: likely to live alone, be aged 40 and over, have previous recorded sexual offences, interact with children online, create websites and/or sell material, and network with others. Internet Relay Chat: likely to work in a team environment, spend less than 30 hours per week online, and have no previous recorded physical offences.

CHILD SEXUAL EXPLOITATION MATERIAL OFFENDING

Typology focus	Author(s)	Description
Offence characteristics (continued)	Carr (2006; continued)	<p>Newsgroups: likely to be unemployed, have a previous recorded physical offence, possess more than 979 images, and possess images sourced outside of the Internet.</p> <p>Email and instant messenger: likely to possess more than 979 images, possess images sourced outside of the Internet, live with a partner, spend more than 30 hours per week online, produce their own material, have previous physical or objectionable publication offences, have access to potential victims, and have organised collections.</p>
	Hartman et al. (1984)	<p>Closet collectors: collect CSEM and deny engaging in CSO or networking.</p> <p>Paedophile collectors: engage in CSEM and CSO offending. May produce their own material.</p> <p>Cottage collectors: collect and produce CSEM to communicate with other paedophiles.</p> <p>Commercial collectors: collect CSEM for financial profit and engage in CSO.</p>
	Krone (2004)	<p>Browser: access CSEM accidentally but save it. Do not network with others or use security measures.</p> <p>Private fantasy: fantasise about children and seek out CSEM. Some networking and few security measures.</p> <p>Trawler: collect a variety of pornography and engage with CSEM out of curiosity. Some networking and few security measures.</p> <p>Non-secure collector: download or distribute CSEM through open sources. Higher level of networking and no security measures.</p> <p>Secure collector: use highly skilled security measures to access CSEM. High level of organisation and engagement with their CSEM collection.</p> <p>Groomer: use Internet to chat with children and send CSEM in an attempt to engage in a sexual relationship.</p> <p>Physical abuser: engage in CSO and CSEM use is supplementary.</p>

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Typology focus	Author(s)	Description
Offence characteristics (continued)	Krone (2004; continued)	Producer: produces and distributes CSEM. Distributor: possesses CSEM for the purpose of sale and distribution.
Psychological characteristics	Henry et al. (2010)	Normal: normal scores on pro-affective and socio-affective measures. Emotionally inadequate: normal pro-offending scores but low socio-affective scores. Deviant: mixed scores on measures, but demonstrated higher pro-offending scores than the other two groups.
Motivations	Beech et al. (2008)	Periodically prurient: access CSEM impulsively or out of curiosity. Not necessarily sexually interested in children. Fantasy-only: use CSEM to fuel paedophilic interests but do not engage in CSO. Direct victimisation: engage in CSEM and solicitation offending to facilitate CSO. Commercial exploitation: produce or trade CSEM for profit.
	Lanning (2001)	Preferential: either have paedophilic or generally deviant sexual interests and access CSEM regularly. Situational: access CSEM occasionally for sexual gratification, financial profit, or out of curiosity. Miscellaneous: media reporters or those conducting their own CSEM investigations.
	Merdian et al. (2013)	Three components: 1. Contact-driven vs. fantasy-driven. 2. Motivation: paedophilic interests, generally deviant sexual interests, financial motivation, or other. 3. Level of networking.
	Sullivan and Beech (2004)	1. Those who collect CSEM and engage in a wider range of sexual offences, possibly involving CSO. 2. Those who collect CSEM in order to satisfy their developing sexual interest in children. 3. Those who access CSEM out of curiosity.

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Appendix B: Search Terms Coding Sheet

Variable	Code	Definition
Male victim	0: No/not specified 1: Yes	
Female victim	0: No/not specified 1: Yes	<i>Note:</i> terms referencing ‘Lolita’ or ‘Lolita series’ coded as ‘yes’.
Prepubescent	0: No/not specified 1: Yes	Terms referencing sexual content involving children aged 13 and younger, including terms such as child, preteen, toddler, kiddies, baby, little, etc.
Other paraphilic material		
Sadism/masochism	0: No/not specified 1: Yes	Terms referencing sexual content involving physical or psychological suffering of another person, e.g. torture, fisting, bondage, spanking, etc.
Zoophilia	0: No/not specified 1: Yes	Terms referencing sexual content involving animals.
Urophilia	0: No/not specified 1: Yes	Terms referencing sexual content involving urination.
Coprophilia	0: No/not specified 1: Yes	Terms referencing sexual content involving faeces.
Fetishism	0: No/not specified 1: Yes	Terms referencing sexual content focussed on non-living objects or non-genital body parts.
Voyeurism	0: No/not specified 1: Yes	Terms referencing sexual content involving the observation of an unsuspecting person who is naked, in the process of disrobing, or engaging in sexual activity.

Note. Definitions of paraphilias provided by *DSM-5* (American Psychiatric Association, 2013).