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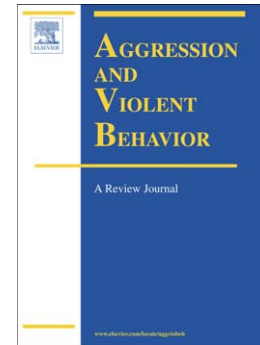
A systematic review and meta-analysis of the characteristics of Multiple Perpetrator Sexual offences

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Title: A Systematic Review and Meta-Analysis of the characteristics of Multiple Perpetrator Sexual Offences**Authors:**

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ABSTRACT

This systematic review examined the demographic and offence variables in group sexual offending. Eight bibliographic databases and three thesis portals were searched. The reference lists of five papers and one textbook were hand searched. Nine experts were contacted for ongoing or unpublished studies. The total number of hits was 1853, of which 55 were duplicates, 1769 were irrelevant, 14 did not meet the inclusion criteria and one paper was unobtainable. The remaining 15 papers were quality assessed before the data were extracted and synthesized. There were 2,873 cases of Multiple Perpetrator

Sexual (MPS) offences in total. The majority of MPS offending in the included studies involved perpetrators in their early twenties (90% of studies), of Black/African Caribbean ethnicity (30.1%), and operated as part of a 'duo' (49.8%). Thirty-five percent of MPS offences were committed by perpetrators with a previous conviction, with 11% of the cases showing a previous conviction for sexual offending. Offenders were most likely to approach victims outdoors with the offence itself occurring indoors. The most frequent offence behaviors included vaginal rape, multiple penetration and fellatio. A model of MPS offending is suggested based on the findings of this review. Future research should aim to explore and refine theories of MPS offending in order to understand the etiology of this unique offending group.

Key words: multiple perpetrator, sexual offenders, group sexual offending, gang rape

1. INTRODUCTION

1.1 Background

Sexual offences committed by groups of perpetrators is an area that receives a considerable amount of media attention, inspiring wide spread fear by the general public. Simultaneously such behavior represents an under-researched area of sexual offending. Frequency of this type of offending is difficult to estimate with rates as high as 50% in South Africa and between 2 and 26% in the US (Horvath & Kelly, 2009). Group sexual offences perpetrated by juvenile perpetrators are thought to make up 42% of allegations in the UK (Woodhams, 2004), making this form of offending a considerable social issue.

Terminology for this type of offender group has varied. However, Horvath and Kelly (2009) refined the definition for those who commit offences in pairs or groups of three or more as Multiple Perpetrator Sexual Offenders (MPSOs). The purpose and function of these groups can vary considerably depending on context. Research has identified rape-occurring contexts to include fraternities (Ehrhart & Sandler, 1985), war (e.g. Wood, 2009) and as a form of cultural norm (e.g. South Africa; Jewkes & Sikweyiya, 2013). Sexual violence within defined “gangs” is one of the most common contexts associated with MPS offending in the UK (Alleyne, Gannon, Ciardha & Wood, 2014). Gang membership is thought to significantly increase the level of violence committed by an individual even if, before gang membership, they had been associating with like-minded pro-social peers (Hughes & Short, 2005).

1.2 Current Psychological Understanding of Multiple Perpetrator Sex Offenders

Research regarding MPS offences initially began in the early 1970s (Amir, 1971) and progressed slowly into the 1980's (Wright & West, 1981) with little else but a basic

understanding of offender demographics. Following Wright and West's (1981) publication research became more prevalent, possibly coinciding with an increase in public awareness regarding sexual offenders and an increase in sexual offences reported to the police (Myhill & Allen, 2002). Some authors have made attempts to form typologies of MPS offending, arguably the most comprehensive and relevant of which has been Harkins and Dixon's (2013) multifactorial model. However, the literature that this and other typologies are based on has a number of limitations and were not based on evidence from systematic reviews as there had not been one completed.

To date research regarding MPS offending has informed our understanding of the 'type' of perpetrator likely to be involved in a group sexual offence (e.g. Porter & Alison, 2006), the interaction style with the victim (e.g. Horvath & Kelly, 2009), and the role of 'leaders and followers' in the group (e.g. Woodhams, Cooke, Harkins & da Silva, 2012). More recently professionals and researchers have expressed the urgent need to apply existing research as a means of determining the most relevant preventative and treatment programs for MPSOs (Horvath, 2011).

1.3 Theories of Gang/Group formation and Group Offending

Due to the limited understanding of MPS offending, wider theoretical perspectives may need to be drawn in to guide future investigations and help explain existing findings. Given the association between group sexual offending and gang involvement, it may be useful to consider the process of gang formation and general group formation and attempt to identify aspects that may contribute to or be associated with group sexual offences. Unlike lone sexual offending, MPS offending may be heavily influenced by the dynamics of the group, how it is formed and maintained, and how it evolves.

One of the most recent theoretical introductions to gang formation is the *Unified Theory of Gang Involvement* (Wood & Alleyne, 2010). This model is distinguished from others based on its inclusion of a non-offending pathway. The authors highlight the individual factors (psychopathy, hyperactivity, anxiety, low IQ, mental health problems), social factors (social control, family bonds, school attainment) and environmental factors (disorganized/organized, neighborhood, family structure) known to make an individual susceptible to gang membership. For a detailed outline of the possible social psychological mechanisms behind the formation and maintenance of gang affiliations, please see Wood (2014).

The critical stage in this theory is peer selection. This aspect is resonant to Patterson, DrBaryshe and Ramsey's developmental model (1990), which denotes that children and adolescents who have learned coercive behavior in dysfunctional family background from early childhood and under-achieve academically at school age are more likely to reject or be rejected by pro-social peers and socialize with those with similar backgrounds. The atypical or delinquent peer groups they engage in may provide the support and identity they cannot obtain from their own families. Once they joined the gang, they will strive to gain acceptance and recognition or enhance their status within the group by meeting the group expectations, which usually involves demonstrating violence, possibly including sexual violence, and engaging in harmful behavior. Even those who disagree with the group norms may display *pluralistic ignorance* where they privately reject a group norm but abide by it publicly because they believe that others are in favor of it.

The *Unified Theory of Gang Involvement* can be understood from the *Group Socialization Model*, which outlines the process of assimilation of an individual into a group in general (Levine, Moreland & Choi 2001). The process involves five stages:

- *Investigation*: a decision making process between the individual and the group as to whether to form a relationship
- *Entry*: the individual joins the group
- *Socialization*: the group socializes the individual to group norms
- *Acceptance*: the individual accepts their position within the group
- *Role negotiation*: the new group member changes and defines their role over time
- *Maintenance*: the relationship is maintained over time

It is likely that at the 'peer selection' or 'investigation' stage, those with the propensity for MPS offending socialize with each other and form a group on the basis of common beliefs about group sexual violence. It is also likely that committing sexual violence is one of the ways to meet group expectations and gain acceptance or recognition. This process of socialization and group bonding may be similar to what Harkins and Dixon (2010) identifies as 'male bonding' in their model.

Another social psychological process that may explain what happens during the offence and those offences committed without gang association is deindividuation. This refers to a state where individuals experience a reduced sense of self-awareness and concerns about consequences in a crowd (Festinger, Pepitone & Newcomb, 1952). This may explain why some individuals engage in MPSOs.

1.4 Aims and Objectives

As there has been no previous systematic review and meta-analysis in this area, the aim of this investigation was to systematically review primary studies that investigated

- the characteristics of multiple perpetrator sexual offending and
- the characteristics of the perpetrators and their victims.

To be included in the review, studies had to fulfill the criteria outlined in Table 1.

The decision on the age cut-off for the population was based on the differences in criminal justice disposal and treatment between child offenders and older offenders. Furthermore, literature pertaining to sex offending generally suggests important differences between these two groups (Miranda & Corcoran, 2000). To increase validity, a range of sources was included. The context of studies was limited to the UK, America, Australia and New Zealand in order for English speaking western societies to be isolated given their similarity in the criminal justice systems and attitudes associated with criminal justice between western societies. Porter and Alison (2006) found a number of differences between MPS offences across countries, indicating a lack of generalizability amongst results and a need to categorize countries operating under similar societal rules.

2. METHOD

PRISMA (Moher et al., 2009) guidelines were followed in conducting this systematic review.

2.1 Search strategy

The following bibliographic databases and other electronic sources were searched on 21st and 22nd January 2014. The Cochrane Library, the Campbell Collaboration, the EPPI Library, PsychInfo, NCJRS (National Criminal Justice Reference Service), MEDLINE, EMBASE, ASSIA, DART European E-Thesis, Nottingham E-thesis, Birmingham E-thesis and Google Scholar (for reliability check). The following search terms were entered into all the databases.

(multiple perpetrator rap*) OR (multiple perpetrator sexual assault) OR (multiple perpetrator sex* offen*) OR (gang rape) OR (gang sexual assault) OR (gang sex* offen*) OR (group rape) OR (group sexual assault) OR (group sex* offen*)

The search syntax can be made available upon request. The following professionals were contacted for unpublished studies or for clarification: Dr Miranda Horvath, Dr Jessica Woodhams, Mr Laurent Mucchielli, Dr Louise Porter, Dr Sarah Ullman, and Dr Louise Morgan. Finally, the reference lists of retrieved papers were hand searched.

2.2 Quality Assessment

All studies that met the inclusion criteria were quality assessed using a quality assessment pro-forma designed specifically for the study design. The pro-formas were adapted from the Critical Appraisal Skills Programme (CASP) checklists designed for use with cohort studies and case control studies. Selection bias, sampling bias, measurement bias, and attrition bias of all the included studies were assessed by the first author. A second reviewer independently assessed five (30%) of the included studies to ensure inter-rater reliability. The results suggested substantial agreement (Landis & Koch, 1977) between authors, $\kappa = .772$, $p < .001$. All the items were recorded as 'yes', 'can't tell' or 'no'. Studies were rejected from the review if they presented with 90-100% of bias. A high quality study would include less than 30% bias, a control group of lone sexual offenders, a participant size in excess of 100, and a sample source that is validated (e.g. Police data).

2.3 Data extraction

To maximize consistency in this process, a data extraction pro-forma was devised. This form was used by the primary researcher to extract data from all 15 studies.

3. RESULTS

3.1 Description of studies

The overall search generated 1854 hits, of which 1769 references were excluded due to irrelevance and 55 excluded due to duplication. A study by Wright and West (1981) was excluded because of lack of availability. This left 29 studies remaining, 14 of which did not meet the inclusion criteria. Primary reasons for exclusion included the lack of quantitative data (e.g. Porter & Alison, 2001) or the location of the study i.e. South Africa (Wood, 2005). Table 2 is a summary of the characteristics of all the studies included in this review, along with their assigned study number. The final sample came from 15 publications. Five publications¹⁻⁵ made use of the same two datasets (1-3 and 4-5). Therefore, when calculating the total number of offenders included across all the studies, the same sample was counted only once. However, these five publications were quality assessed and synthesized separately for their research quality due to different methods and outcome measures employed. Overall, there were eight cross sectional studies^{1-5, 10, 12, 13} (involving MPSOs only) and seven case control studies^{6-9, 11, 14, 15} (comparing LSOs and MPSOs). Figure 1 outlines the literature search and selection process.

There were a number of data sources accessed by the final sample of papers with some studies employing multiple sources of data. Five studies^{1-3, 11, 14} made use of information from single Police databases, with two further studies extracting data from the Serious Crime Analysis Section (SCAS) database which holds information from police forces around the UK. It is not possible to identify the overlap of individual cases across those studies. Only two studies employed a questionnaire methodology.

All of the included studies involved populations from the UK^{1-3, 6, 8, 9, 13-15} ($n = 9$), the US^{7, 10-12} ($n = 4$; studies) or both countries combined^{4, 5} ($n = 2$).

3.2 Study Quality

There was a medium to high level of study quality across papers. Overall, case control methods were completed to a slightly higher standard. Table 3 outlines the results of quality assessment for each of the included studies. The quality is considered good for the majority of studies. The most common limitations were in regards to a lack of mention of ethical approval ($n = 10$) and a lack of blind coding ($n = 10$; where information was systematically coded).

Measurement bias was endemic with the sample of papers included in the review ($n = 14$). Seven papers^{1-3, 7, 9, 11, 12} managed to acquire both victim and perpetrator statements but eight papers collated only victim statements. Statements made by victims can contain distortions (Alison, Snook & Stein, 2001) based on stereotypical expectations of what rape involves (Du Mont, Miller, & Myhr, 2003). Validation was most commonly achieved through law reports that comment on information that has been tried in court. Only eight papers^{4, 5, 6, 8, 10, 13-15} ($n = 869$) sought validated data. Regardless of the sources of the information, an inherent difficulty is that the reporting and recording of incidents is rarely carried out with empirical research in mind and the quality and type of information

inputted into databases may not be consistent (Horvath & Kelly, 2009). As such, behaviors that are not considered necessary or pertinent to investigations or legal proceedings may not be reported or recorded. An example of such omission is the behavior “kissing”, as it may be considered a less important detail to securing a conviction.

Similarly, methodological issues such as a lack of inter-rater reliability resulted in measurement bias in seven studies^{1,10,11,13,14,15}. When official databases were searched and relevant information was coded, only three papers^{2, 5, 8} reported inter-rater reliability testing to ensure the reliability of their coding schemes. Indeed, Wright and West (1981) did not describe any form of systematic coding scheme. Furthermore, none of the papers reported the use of blind coders, which could have increased the likelihood of measurement bias.

Two of the included studies^{7, 12} sought information through use of questionnaire’s administered to a sample of women in the general population as a means of identifying those who had been victims of MPS offending. A primary limitation of this retrospective methodology is that the responses are more susceptible to biases in recall (Ullman; 2007). In Ullman’s 2007¹² study respondents to the 45-minute questionnaire were awarded financial payment (\$20) for their completed forms. This was the only study that offered a reward to participants. For some respondents this may have been an incentive to fabricate their own victimization. Indeed, Bigorra and Banos (1990) found that 90% of people surveyed said that financial compensation was their main motivation for becoming involved in research. The issue of payment for research subjects is controversial. It is well known that the offer of money substantially increases the response rate of participants in research (e.g. Ulrich et al., 2005), which makes it an attractive strategy to

researchers. However, it may be that lower income individuals are more likely to respond to paid questionnaires, which would result in a skewed sample of respondents.

Attrition bias was difficult to measure given that attrition could have occurred through three means:

- Lack of response from a questionnaire methodology
- Exclusion of cases based on missing information
- Rapes that remain unreported

Only one paper¹ commented on the statistical differences between excluded and included samples resulting in a significant difference in the age of victims, $t(99) = 4.1$, $p = 0.0001$ and the age of perpetrators, $t(99) = 4.5$, $p = 0.0001$. This is evidence, albeit from a single study, that the cases excluded from studies may be qualitatively different from those included. Rape offences are significantly underreported with recent figures suggesting that only 15% of victims report their abuse (Home Office, 2013). Some suggest that group rapes are even less likely to be reported (Andersson, Mhatre, Mqotsi & Penderis, 1998). The high levels of alcohol and drug use by victims may result in a reluctance to report the offence due to a misconception that they might be held responsible for their actions. Indeed, it has been reported that victims are less likely to be treated as credible by the police and medical services if their account of the rape does not fit with the rape 'stereotype' (Maier, 2008). Studies that rely on crime reporting are unable to account for differences between those reported and the 'grey' area of unreported crime. Just two studies (13%) included in the review^{7, 9} mentioned ethical considerations.

The geographical locations of studies were substantially different. A number of studies, although completed in a country that met the inclusion criteria, were limited in respect of geography. Six^{1-3, 7, 9, 11} of the 15 papers used samples from a single location in

the UK e.g. a single urban police force sample. Where the authors offer descriptions of these samples they often refer to urban samples. There may have been qualitative differences between geographical regions and between rural and urban samples.

3.3 Data synthesis

Aside from these methodological limitations and variations, all studies reached a good to high level of quality, suggesting merit in considering statistical comparison amongst study data. An overall test statistic for homogeneity of variance (I^2) was not possible based on the lack of consistent reporting for variables. However, individual sums of I^2 scores were computed for each category of variable. These scores demonstrated heterogeneity within the samples used as part of the meta-analysis (>59% for three out of four categories of variables), supporting the use of a random effects model. As meta-analysis involves the amalgamation of studies with different sample populations they are therefore unlikely to meet the expected homogeneity of variance assumptions required for usual statistical analyses (Mullen, 1989; Rosenthal, 1991). A lack of homogeneity has been considered by some to exclude the option of meta-analysis. However, it has been argued that heterogeneity is an expected consequence of amalgamated studies with different populations and methodologies and that heterogeneity alone is not sufficient enough a barrier to preventing meta-analysis (M. H. van IJzendoorn, personal communication, 23.05.2014).

3.3.1 Comparing lone and group offender demographics

Twelve studies^{1,2,4,-6,8-13,15} reported ages for MPS offences. Where age was given in categories the mid point of the most frequent category was deemed the numeric figure for that study, for the purpose of data assimilation. Although age was not input into the

meta-analysis due to a lack of consistent reporting, the difference between age in lone and group offenders was statistically significant when conducting an independent t-test, $t(3716)$, $p < .001$.

Hauffe and Porter (2009)⁸ were the only authors to report the inclusion of two female offenders in their sample as a result of seeking information from law and media reports. These offenders would not have met the inclusion criteria of the current review. However, data from females had not been separated by the authors of the original paper and could therefore not be excluded. Similarly, Porter and Alison (2006, p. 362)⁵ report their data sample to have included 25 cases from “a variety of countries, although most frequently from Israel”. Again, the inclusion of offences from studies outside of the UK and US would not meet the inclusion criteria for this search. Therefore there is the possibility that the final sample comprising all studies has been theoretically contaminated by mixing in a minority of female offenders and offences committed in other countries.

Unfortunately too few ($n=5$) studies^{3, 6, 8, 11, 13} reported on the ethnic composition of offenders in order to successfully form part of the meta-analysis. Nevertheless, frequency statistics revealed the most common ethnicity of MPS offenders across all studies to have been Black/African Caribbean ($M = 36.3$, $SD = 21.49$), closely followed by White offenders ($M = 30.03$, $SD = 12.43$). However, lone offenders demonstrated a higher rate of Black/African Caribbean offenders. This varied picture is consistent with other authors who have considered the relationship between MPS offending and ethnicity to be complex (Lambie, 2013). Indeed, some have suggested that the ethnicity of the perpetrator is correlated with the ethnicity of the victim (Wright & West, 1981) with offences often occurring between offenders and victims of the same ethnic backgrounds. Only two studies^{9, 11} reported the ethnicity of lone offenders. Morgan, Brittain and Welch

(2012)⁹ reported 46.8% of lone offenders to have been Black, with 39.6% of White offenders. Ullman (1999)¹¹ reported the majority of offenders to have been of 'mixed race' (categories unknown) with only 10.2% being White. When considered together these results suggest that lone offenders may be marginally more likely to be of a minority ethnic group than MPSOs. The latest figures (Ministry of Justice, 2012) report 36.1% of the prison population to be White offenders. Black, Asian and Mixed race offenders combined represent 52.1% of the prison population. These results may therefore reflect the broader picture of ethnic composition in convicted offenders.

The difference in prevalence of general previous convictions for lone and group offenders was not consistently reported on and was therefore inadequate for statistical analysis. However, lone offenders possessed more previous sexual convictions (25%) than group offenders (13.33%). This suggests that the majority of MPS offenders had either avoided detection or had refrained from committing sexual offences before the group rape. While it is not possible to estimate the mean ages of offenders within the eight studies that directly compared lone and MPS offenders, based on the estimates taken across all 15 studies, it is possible that lone offenders had a shorter offending history given their young age at conviction for the group sexual offence. However, future comparative research needs to record and analyze age of sexual offences more precisely to ascertain whether age and length of forensic history are different between lone and group offenders. Furthermore, Chambers, Horvath and Kelly (2010)¹ have suggested that group sexual offenders are less likely to be convicted for the offence because of the complex issues regarding responsibility and culpability in an offence involving multiple perpetrators. Therefore it is possible that, whilst lone offenders are more easily apprehended, group offenders may be able to commit the same offence on a number of occasions and avoid formal conviction.

Sexual conviction rates may also be explained by motivation. For example, lone sexual convictions may be more likely than group sexual offenders to persist after punishment (i.e. conviction) due to being driven by strong psychological motives, such as sexual preoccupation. This is only a preliminary hypothesis and further research is needed to understand why the pre-conviction rate for group sexual offenders is lower than that of lone sexual offenders. When considering previous convictions generally, lone offenders possessed a higher rate (46.6%) than MPS offences (35.15%). According to the most recent figures, (Office for National Statistics, 2014) sexual offences comprise 30% of the total offences reported in the UK. Therefore the composition of sexual offences for the MPS offender sample (32% of all convictions) is a reflection of the wider UK population. Lone offenders had an above average number of previous sexual convictions in comparison to the rate of general convictions (54%). Nevertheless, these rates are both higher than the population average (25%; The Independent, 2013) suggesting that MPSOs were more inclined than the general population to have offended previously. Of the two studies^{5, 8} to report previous convictions for MPS offenders an average of 38.3% of previous convictions were for violent offences. Previous burglary and robbery offences were the most frequent amongst the samples ($M = 49\%$, $SD = 43.84$). This suggests a moderate level of criminal versatility amongst MPSOs.

Seven^{1, 3, 4, 8-10, 13} out of the eight studies found pairs of offenders (otherwise termed “duos”) to be the most common group size. It could be argued that a pair is fundamentally different from a group in regards to the influence of group dynamics. Indeed, the literature pertaining to offending groups or gangs most often refers to processes that would require a number of people, rather than a pair. For example, conforming to norms of the group majority is only possible when there exists more than one other individual.

Five studies^{2, 5, 6, 9, 11} reported the most common relationship between victim and perpetrator of MPS violence to have been that of strangers with a mean percentage of 60.33% (SD = 22.20). This is different to general current understanding of lone sexual offences, which are most common between individuals who are already familiar (to various degrees) with one another (Home Office, 2013). Indeed, the most common relationship between victim and perpetrator for lone offenders in the present review was that of a '*casual known acquaintance*' (M = 58.6%, SD = 3.95). A further 33.45% (SD = 44.24) of lone rapes occurred between strangers. This result says something interesting about the processes of victim targeting and acquisition and may mean that victims of group sexual offences may be less likely to successfully identify their abusers should they chose to report the incident. More research is needed to help identify and educate those most at risk of becoming victims of group sexual offending.

The high percentage of substance use in MPS offences (48.53%) is indicative of the types of environments that victims are often acquired e.g. social situations. Similarly, the misuse of alcohol (found in 54.05% of MPSOs) is a problem that is most likely to be associated with young people (Bailey & Williams, 2006). Lone offenders demonstrated very similar prevalence of drug and alcohol use. Despite the differences in age between the two offender groups, both populations demonstrated a high propensity to desensitize themselves using substances.

Significant differences were found between the rates of current employment for lone and MPS offenders, suggesting that lone offenders were more likely to have been able to maintain employment. The relatively low rates of unemployment in both samples suggest that for many offenders a lack of lifestyle structure was not a driving factor to committing the offence. There was a statistical trend for lone offenders to be more likely to be part of a romantic relationship at the time of their offence. This result may be

attributable to the young age of group offenders who may therefore have been less likely to have the time and opportunity to develop a relationship.

3.3.2 Victims of group offending

Ten of the twelve studies^{1-4, 6-13, 15} reported on variables related to victims of group sexual assaults. Descriptives for victim demographic variables are given in Table 4. Victims were, on average, younger than MPS offenders. This is consistent with the notion that victims are often chosen because of their apparent vulnerability. There were high frequencies of alcohol and drug use by victims, which matched that of MPSOs. This may be representative of the social context in which victims are acquired where both offenders and victims engage in substance misuse. The majority of victims were White. This is at odds with the suggestion that offenders and victims are often of the same ethnicity (Wright & West, 1981), as MPSOs were most often of Black/African Caribbean ethnicity.

Only one study⁷ reported on the average household income of victims, finding the most frequent range to be between \$35,000-\$55,000. The average household income at the time of the study was \$50,200 (National Centre for Education Statistics, 2013), suggesting that victims were of lower social economic status.

3.4 Quantitative data synthesis

Table 5 reports the statistical comparisons made for all variables where a comparison was possible ($k = 2$ or more). Comparative statistical analyses were only conducted for studies where a control group had been included ($n = 7$). As demonstrated in Table 3, all studies entered into the meta-analysis had achieved reliable standards of quality. The unit of analysis was offending cases, rather than number of offenders.

Binary proportions odds ratio calculations were conducted for dichotomous variables (e.g. location approached) and ordinal measures (e.g. ethnicity). The odds ratio scores refer to the chance of MPSOs displaying a certain characteristic over LSOs. For example, the victim was 4.29 times more likely to be a stranger in MPS offences when compared to cases of LSOs. The Odds ratio scores were generally low (e.g. >3.00) although particularly high odds ratio scores were noted for non-forceful physical response by the victim, anal intercourse, oral rape, vaginal rape and stranger victims, with cases of MPSOs demonstrating a higher odds of these events occurring when compared to LSOs.

As evident from Table 5, 15/23 (65%) of effect sizes reached statistical significance. Confidence Interval (CI) scores were in general quite broad, demonstrating the large standard deviation of some variables. The lowest CI was in respect of employment at time of offending, indicating that the frequency of this variable is close to the true mean of the overall population. The largest confidence interval and effect size was demonstrated in respect of the sexual behavior of anal intercourse, indicating less precision in this statistic and suggesting that the sample mean is the farthest from the true mean of the overall population.

When analysis compared offender groups from the seven studies, the prevalence of alcohol and drug use increased by approximately 9% for each variable when compared against statistics from all 15 studies. This suggests that studies without a control group may have underestimated the substance misuse of group sexual offenders. A similar result was found in respect of weapon use, with a 10% increase in prevalence from the seven studies as compared to all 15.

3.4.1 Comparing lone and group offending behaviors

Only two studies made comment on sexual murderers. Ullman (1999)¹¹ reported the decision not to include murders with a sexual element in their study. This was based on a selection criterion whereby the behavior of rape must have been the most serious incident in the offence. Whereas Hauffe and Porter (2009)⁸ reported their sample to have included rapes where the victim was ultimately killed, whether intentionally or unintentionally. This is important to note when considering the consistency of included cases across the sample as a whole and the possibility of bias sampling.

The most common approach location for lone offenders was indoors ($M = 51\%$, $SD = 14.4$) with one study⁹ reporting the majority of rapes (32.1%) to have occurred in the home of the victim. However, for group offenders the most common approach location was outside. The most common location of the lone assault ($n = 4$) was either described as “indoors” or more often as in a “private dwelling”. However, there was a negligible difference in location victimized in-group offenders with higher prevalence of offences occurring outdoors. This difference may be a reflection of the varied motives of lone and group offenders. MPS offenders may have acquired their victims outside through either group coercion or a swift group attack. In either instance the power of the group greatly succeeds that of the individual. This would be less evident for offenders working alone who may be more likely to succeed by approaching the victim when they were alone and already indoors, limiting the need to travel with the victim.

Violence occurred in 61% ($SD = 11.4$) of lone rapes with few involving use of a weapon ($M = 10\%$, $SD = 4.2$). Violence used in MPS offences was evident for an average of 49% ($SD = 24.4$) of the samples ($n = 3$) with weapons used 21% ($SD = 19.8$) of the time. The differences between groups for violence and weapon use failed to reach statistical significance. However, these results represent the increased likelihood of weapon use by MPS offenders. The group rape itself is more likely to be considered a

violent act based on the increased probability of harm caused to the victim by multiple offenders. It is surprising therefore that MPS offences were more likely to involve weapon use, given that perpetrators would have been less likely to require additional aids to secure the compliance of the victim. This suggests that weapon use may be driven out of a sadistic desire to induce fear in the victim or as a display of power by the group member(s). This finding has interesting implications for the treatment needs of MPS offenders.

There was a smaller spectrum of sexual behaviors reported for lone offending when compared to MPS offending, most likely as a result of the limited number of studies with control groups (7/12). When reviewing all of the studies ($n = 15$) the most common sexual act for both groups of offenders was that of vaginal rape. Perhaps expectedly with the MPSOs, multiple penetration was the second most prevalent behavior ($M = 45.91\%$, $SD = 23.05$). However, the standard deviation calculations should be considered when interpreting these results, as there was significant variation between studies. It is likely that some of this variation is accounted for by differing definitions of offence behaviors and by the information source. For example, for studies that sought information from victim statements only^{1, 5} there was a greater prevalence of multiple penetration ($M = 60\%$, $SD = 28.28$) than for studies that reported data from law reports^{6, 10} ($M = 31.85\%$, $SD = 0.24$). This result was statistically significant $t(1008)$, $p < .001$.

When considering the seven studies with control groups, the effect size calculations found significant differences between cases of lone and MPS offenders in four of the six sexual behaviors, with the strongest effect sizes evident for two offence behaviors; fellatio and oral rape. The high prevalence of oral rape may be a reflection of the high frequency of multiple penetration in MPS offences. It may also be that, if victims of MPS offending were often under the influence of alcohol ($M = 45\%$, $SD =$

35.9) or drugs ($M = 45\%$, $SD = 31.2$) at the time of the offending their ability to perform sexual acts, whether threatened or not, will have been physically impaired. This may explain why sexual behaviors demanded of the victim (e.g. masturbation) were low in frequency in group sexual offences.

In terms of victim response, victims of MPS offending were significantly more likely to respond in some way to the offence occurring, the most common of which was that of non-forceful verbal responding. This is an interesting result as it suggests that, despite the victim being overpowered physically by the number of perpetrators, they still made attempts to resist the assault through various means and were significantly more likely to use either forceful or non-forceful physical means of resistance.

The next section of this study will discuss the statistical results presented so far in greater detail and attempt to draw inferences from the results obtained through the meta-analysis.

3.5 Descriptive data synthesis

Three papers^{1, 2, 4} had attempted to apply offending typologies to MPS offences. Table 7 describes these themes. There appears to be some overlap between the three papers in respect of the type of offending themes identified. For example, all of the typologies make reference to a theme involving physical violence: the “Violence” theme¹, the “Force” theme² and the “Hostility” theme³. From the current review a number of significant variables have been identified that are considered more likely to occur in-group rather than lone sexual offending. It is hoped that future research will be able to expand upon this to identify different methods of offending and associated

functions of the offending. For example, if the offending theme was that of “violence” it may indicate that the victim would be at greater risk of physical harm with the function of the offending being a sadistic interest in causing harm or dominating a victim.

The majority of MPS offences included were committed in a pair. This suggests there may be something unique about duo offenders. Indeed, research has begun to consider the roles of “leaders” and “followers” (e.g. Woodhams, Cooke, Harkins & da Silva, 2012) in-group offences, which may be more apparent in pairs of offenders. Only one study⁶ in this review considered separating duo offenders from group offenders. There were only three variables that were comparable across the three offender cohorts, as shown in Table 7. Unsurprisingly the larger the group size, the longer the offence lasted. Interestingly, the age of the offender decreased with group size; a result that has previously been found consistent (e.g. Amir, 1971). This reflects the aforementioned literature regarding the importance of status and peer group allegiance in adolescents particularly. It may be that involvement in group offending reduces with age as the individual develops a sense of autonomy and reduces their need for peer approval. The recent publication of this paper suggests that the field of MPS offending may be moving towards a more informed direction whereby such categorization is taken into consideration by researchers.

Victims of MPS offending were more likely than not to have ingested alcohol shortly before the offence. This behavior was demonstrated in a number of typologies whereby victims were approached in a social context. Where victims were chosen due to their perceived vulnerability, alcohol use may have preceded any interaction with the offender. The victim may have voluntarily ingested alcohol and was thereafter targeted by the offenders due to their inebriated state. Alternatively, alcohol use may have been instigated by the offenders as part of a planned approach to ensure the compliance of the

victim. This has important consequences for social education incentives regarding the dangers of alcohol use and the relationship with victimization. There was a high frequency of “outdoors” approach locations, which should be considered when educating those most at risk.

The most frequent offence behaviors were that of vaginal rape (87.45%), multiple penetration (47.88%) and fellatio (38.5%). These offence behaviors are more indicative of offences driven by sexual and dominant motives. Indeed, violence was prevalent in the majority of MPS offences (61.34%). The papers representing the highest level of violence^{8, 9} reported 76.66% and 76.9% of offences (respectively) to have included violence. Interestingly the data sources of these studies were very different to one another (law reports and victim referrals to a sexual health clinic, respectively). This suggests that there may be limited influence of selection bias on offence behavior outcomes. These outcomes collectively suggest that victims of MPS offending may be at greater risk of offenders with serious sexual or violent motives. Accordingly this demonstrates possible prevalent treatment needs for MPS offenders, such as a *Sexual Preference for Violence or Domination* from the Structured Assessment of Risk and Need (SARN; Thornton, 2002) assessment.

4. DISCUSSION

The current research has shown limited understanding of MPS offending and those that are most likely to become involved. A brief review of independent studies revealed a number of consistent results amongst variables with reported inconsistency arising predominantly in regards to the ethnicity of the perpetrators (Lambine, 2013). Nevertheless, a tentative model of MPS offending was developed based on our findings

(please see Figure 2). This included offender demographics, victim demographics and offence behaviors.

The model presented (figure 2) is a risk profile derived from a specific set of data. It is indicative of those most at risk extracted from a sample of over 2,800 cases of MPS offending. It is not an accurate profile of every MPS offence nor is it there to determine that those who meet the profile will become, or are currently, MPS offenders. However, this knowledge can be used by those promoting social education incentives as a means of targeting those most at risk of MPS offending e.g. young males from urban locations. The strength of such a risk profile is reinforced when considered in unison with traditional theories of group formation. For example, Wood and Alleyne's (2010) Unified Theory suggests a number of factors that may make someone more vulnerable to gang membership e.g. low IQ and psychopathy.

There was limited opportunity to compare lone sex offenders with MPS offenders. However, when compared, LSOs were shown to be significantly different to MPSOs in respect of 65% of their offence behaviors. Most significant were the differences in prevalence of non-forceful physical resistance by the victim and the commission of anal intercourse, both of which were more prevalent in group sexual offences. Other significant differences with high odds ratios were found in relation to the offender relationship to the victim as a stranger (OR = 4.29), oral rape (OR = 4.27) and vaginal rape (OR = 4.56). More research is needed in respect of making direct comparisons with lone sexual offenders in order to distinguish MPS offenders as a distinct category.

The studies assessed were limited by methodological shortfalls, primarily involving the issue of data sourcing. Studies that analyze crimes of any kind are biased in respect of the issue of reporting. The offences that remain unreported may be qualitatively different to those that are, resulting in sampling bias. A further threat to the

quality of research is the use of a single data source (e.g. victim accounts). This limits the reliability of the information due to a lack of formal validation (e.g. arrest record) and as a result of the information being “one-sided”. Despite the limitations identified study quality in other areas was generally high. Although it would have been possible to conduct a cohort study for this question, there was no evidence of such papers. Traditionally high quality designs (e.g. RCTs) could not have been considered due to the nature of our research question. However, a consistent criticism of the existing primary studies was the lack of systematic and validated coding schemes. If future research regarding MPSOs is to study data using this method the process should involve rigorous, systematic data extraction techniques which are measured for inter-rater reliability and performed by those blind to the study aims. Although double-blinding is not possible with this type of study, single blinding is an important step to ensure impartial coding.

The decision by Ullman (1999) to eliminate sexual murderers from her sample is interesting in light of the possible motivations of the offender. By eliminating sexual murders Ullman is, possibly, suggesting that the ultimate aim was to murder the victim with a secondary goal of sexual assault. However, MPS offences may have been initially sexually motivated with the murder occurring through chance e.g. the violence becoming more extreme than planned and resulting in the death of the victim. It may have been a more rigorous process to consider the general profile of offenders (e.g. previous convictions for sexual offences) or the sequencing of offence behaviors. For example, if the victim was either dead or dying during the sexual assault this may have been indicative of a more sadistic rather than sexual interest.

When comparing study quality with outcome variables it appeared that studies making use of validated data sources (e.g. official police data) reported, on average, greater use of weapons and violence than studies employing non-validated data (e.g.

unsubstantiated victim reports). This result suggests that respondents to victim surveys did not experience greater violence, which may have deterred them from reporting the offence, nor were they susceptible to exaggerating the extent of the violence perpetrated against them. The use of law reports has advantages and disadvantages. A primary advantage is that the majority of law reports have been based on evidence that has been tried in court. Such reports are usually written from a combination of evidential sources, limiting the bias that might occur through information sought from, for example, victims only. However, these reports do not account for the vast majority of rape offences that do not lead to a conviction (estimated at 90%; Lloyd & Walmsley, 1989). Media is another useful source of information. If a case has received a great deal of media attention there are usually a number of sources reporting on the same offence. If these reports are collated and compared, this can reduce the level of personal bias that may have arisen from a single report. However, an inherent bias in media reporting stems from the tendency to select “sensational” cases or emphasize the sensational aspects of a case.

Studies employing inter-rater reliability were more likely to report the specific sexual behaviours involved in the offence, possibly due to the study methodology being more rigorous. There were no substantial patterns identified between studies which employed multiple data sources (victim and offender accounts) and those making use of a single data source. On average, the former reported greater than average prevalence of fellatio and vaginal rape within the offence, but less oral rape, kissing, anal rape and masturbation.

Synonymous with theories of group offending, the review found group offenders were most likely to be of a young age and therefore at a developmental stage where group membership would have been important and susceptibility to influence by others would have been high. However, the most common size of group was that of a duo. Whilst this

is not in line with the notion of “group” influence, it is in line with the prevalence of co-offending in general where pair offending is more prevalent than group offending (Stolzenberg & D’Alessio, 2008). It will be useful if researchers investigate pair/group sexual offending separately from other types of co-offending. Nevertheless, pair offending occurs in the company of one other person and is therefore still subject to peer influence or the influence of their company (McGloin & Stickle, 2011) although it may be that larger, less common, offending groups are more susceptible to group influence factors, such as *group polarization* (Isenberg, 1986) and deindividuation. Future research within the literature should seek to narrow focus on the formation and maintenance of sexual offending groups specifically in order to identify whether this type of offending group is subject to the same factors, such as those proposed by Levine and colleagues (2001). In a similar vein, the hierarchical structure of offending groups requires further study to identify how offence behaviors may be unique to certain roles within groups. For example, *core members* (Decker & Van Winkel, 1996) may be more likely than peripheral group members to perpetrate extreme violence against the victim.

In considering theories of group offending specifically, Harkins and Dixon’s (2013) model incorporates individual factors, sociocultural influences as well as those occurring within the situation. The reviewed primary studies did not explore sociocultural factors or how these influenced individual beliefs or behavior. This multifactorial theory could guide future research to include the influence of situational or sociocultural factors on the individual, for example, by exploring the presence of hyper-masculine beliefs. It would also be of empirical relevance to consider the early experience of the individual offender as a means of testing developmental explanations for later criminal affiliations (e.g. Patterson, DeBaryshe & Ramsey, 1990). The Unified Theory of Gang Involvement (Wood & Alleyne, 2010) suggests that low IQ, hyperactivity and psychopathy makes an

individual more vulnerable to take an 'offending pathway'. Exploration of these cognitive vulnerabilities would add to our developing understanding of the profile of MPS offences.

Given the sensitivity of the topic and the protection that may be required for victims who could be considered vulnerable, it will be important for future studies to have explicit guidelines on the ethical considerations relevant when conducting research with victims of sexual crime. For studies that employed a questionnaire design it would have been important to consider the implications on victims of discussing and giving detail regarding their sexual assault, particularly if they have not felt able to officially report the rape. However, it is appreciated that for studies which sought information from law and media reports, ethical considerations may be less critical given that this information is freely available to the general public.

Etgar and Prager's study (2009) is the only paper to date that discusses the treatment of MPS offenders. The paper contains a case study of just two juvenile offenders in the same treatment group in an Israeli prison. The applicability of this study is therefore limited due to the differences between the Israeli Prison Service (IPS) and elsewhere. Although the IPS sex offender programs have shown an increase in the use of CBT-based group therapy this can often be used in conjunction with pharmacological treatment (Birger, Bergman-Levy, & Asman, 2011). Future research could still build upon the outcomes from Etgar and Prager's study with other populations.

5. CONCLUSION

This systematic review and meta-analysis has enabled tentative conclusions to be drawn regarding MPS offenders and their offence behaviors. The included studies made use of a number of data sources adding to the overall validity of the results. However,

there were methodological limitations that reduced the reliability of the coding schemes applied to database sources. Future research should seek to amalgamate our existing knowledge of offender and offence behaviors in order to streamline our knowledge and apply a single model of MPS offending. From this researchers may then be able to disentangle our knowledge of MPS offender typologies as a move towards defining the various sub-types of MPS offenders. This will be an essential first step to identifying individual treatment needs for offenders.

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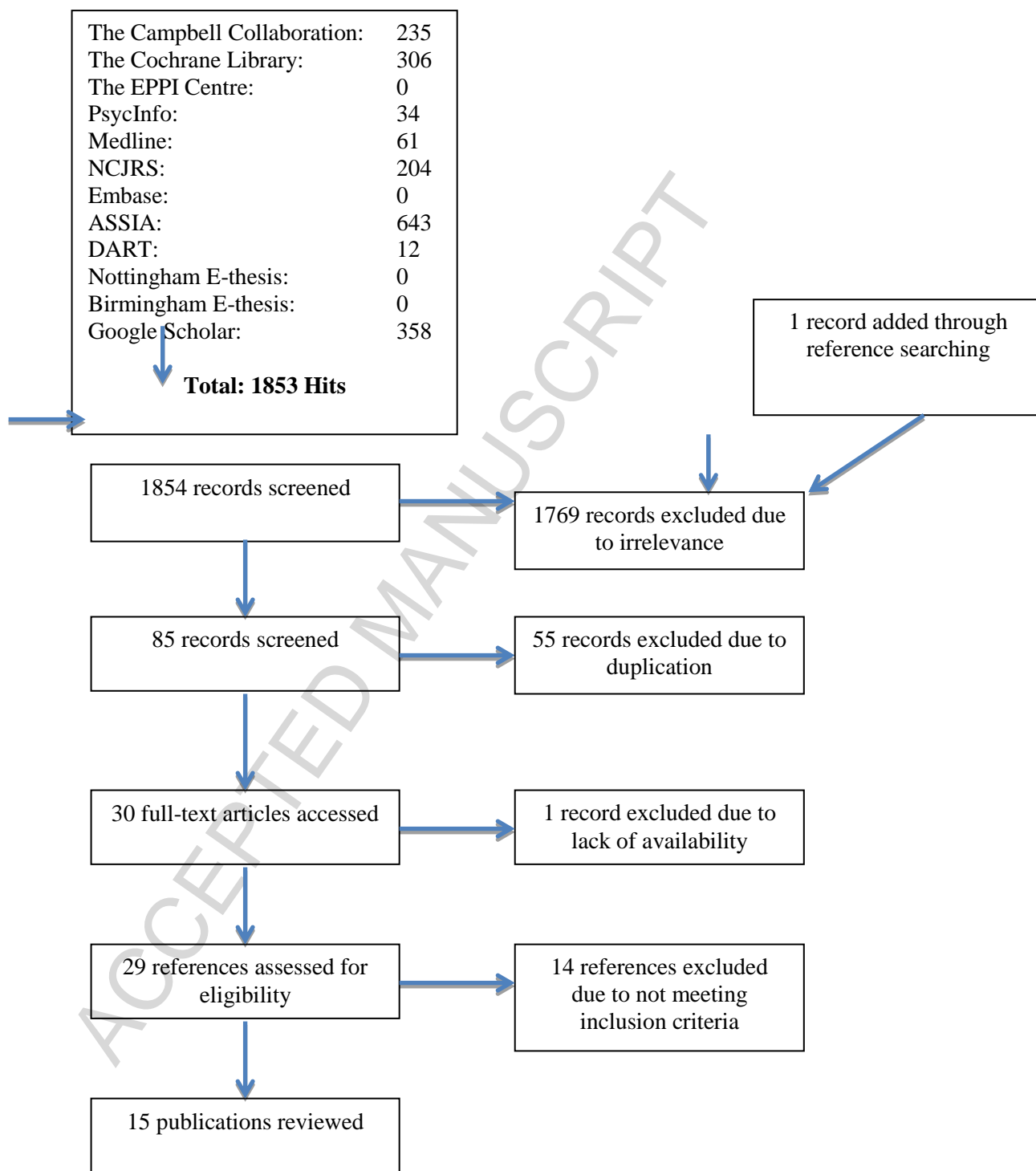


Figure 1: Search and selection process

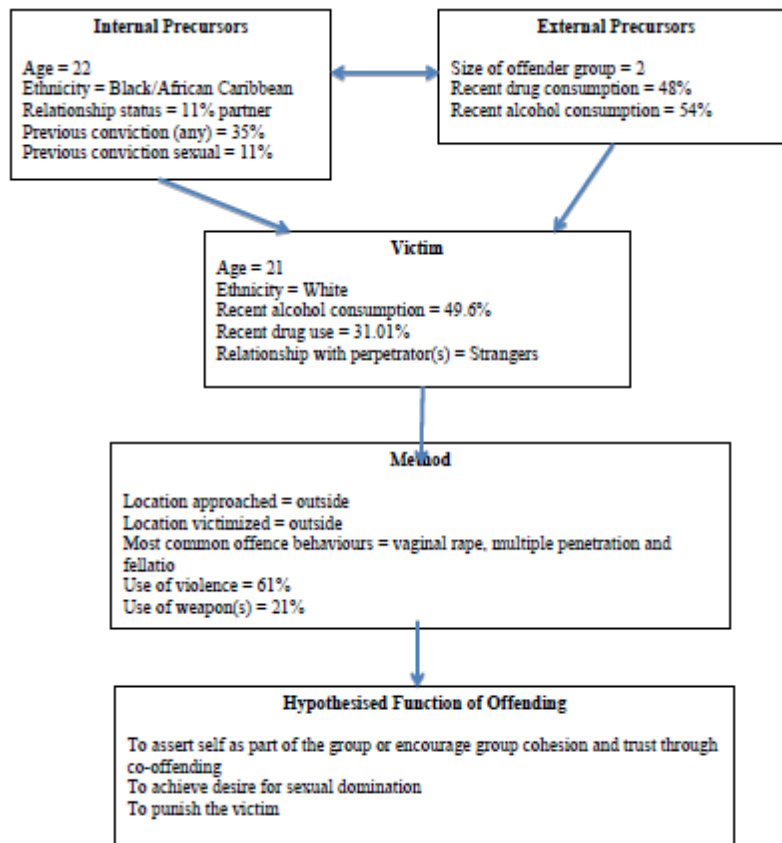


Figure 2: Application of review results to MPSO offending model

Table 1: Inclusion/Exclusion Criteria

PICO	Inclusion	Exclusion
Population	Adult men (>18 years old)	Children (< 12 years old)
	Adolescents (> 12 years old)	Women
Exposure	Any personal or background factors	None.
Outcome	Conviction for group (2+) sexual offending	Non-sexual group offending
	Allegation of group sexual offence	Non sexual lone offending Sexual offending by lone perpetrator only
Context	UK, America, Australia and New Zealand	Non-western countries
	State prison establishments (private or public sector) Secure hospitals Community based settings e.g. probation services Police reports	English not the first language
Study design	Case-control and cross-sectional	Literature reviews and opinion papers

Table 2: Overview of Study Characteristics and findings

Study no.	Study Authors, Study type Study location	No. of offenders	No of cases	Age (mean age)	Ethnic	Most common group Size	Measures	Location Approached	Location victimized	Violence	Weapon use	Victim Relationship	Offence Behaviors of LSOs	Offence Behaviors of MPSOs
1	*Chambers, Horvath and Kelly (2010) Cross sectional UK	No information given on the number of suspects.	75 victim statements for MPSOs	20.84	-	Duo	Coding of single police force database	Outside	Private dwelling	57.3%	14.7%	-	-	42.7% fellatio 57.3% vaginal rape 40% multiple penetration 24% sexual fondling 22.7% kissing 21.3% condoms used 17.3% attempted penetration 16% vaginal intercourse rear 14.7% digital penetration 13.3% anal intercourse 13.3% oral ejaculation 12% masturbation
2	*Chambers, Horvath & Kelly (2013) Cross sectional UK	No information given on the number of suspects.	101 victim accounts for MPSOs	21	-	Duo	Coding of single police force database	Perpetrator dwelling	Private dwelling	-	-	Stranger	-	Not reported
3	*Horvath & Kelly (2009) Cross sectional UK	No information given on the number of suspects.	101 victim statements for MPSOs	21	African Caribbean	Duo	Coding of single Police force database	Outside	Private dwelling	-	-	-	-	Not reported
4	**Porter & Alison (2004) Cross sectional UK & US	739 MPS offenders	223 cases of MPSOs	21	-	Duo	Coding of law and media reports	-	-	-	-	-	-	Not reported
5	**Porter & Alison (2006) Cross sectional UK & US	739 MPS offenders	223 cases of MPSOs	20	-	-	Coding of law and media reports	Outside	Inside	64%	52%	-	-	40% fellatio 93% vaginal rape 1% oral rape 32% multiple penetration 14% sexual fondling 13% kissing 15% attempted penetration 4% vaginal intercourse rear 4% object penetration 6% digital penetration 20% anal rape 4% masturbation
6	Da Silva, Woodhams & Harkins (2013) Case control	112 LSO suspects 210 Duo suspects 380 MPSO suspects	112 LSO allegations .112 Duo allegations 112 MPSO allegations	24.5	White	3	Coding of SCAS database of UK Police forces	Indoors	-	-	-	-	34.9% fellatio 57.8% kissing 5.4% condoms used 17.4% masturbation	58.6% fellatio 38.7% kissing 32.1% condoms used 6.3% masturbation

UK														
7	Gidycz & Koss (1990)	No information given on the number of suspects.	44 victim statement of MPSOs	-	-	-	Questionnaire to victims from college sample	Social situation	-	30.46%	-	-	Not reported	Not reported
	Case control		44 victim statements of LSOs											
US														
8	Hauffe & Porter (2009)	60 LSOs 263 MPSOs	60 LSO cases 120 cases of MPSOs	21	-	Duo	Coding from law and media reports	-	Indoors	76.66%	40%	-	Not reported	46.6% fellatio 91.66% vaginal rape 31.66% multiple penetration 11.66% sexual fondling 11.66% kissing 5% object penetration 8.33% digital penetration 10% anal rape
	Case control													
UK														
9	Morgan, Brittain & Welch (2012)	No information given on the number of suspects.	Victim statements of 139 cases of LSOs and 136 cases of MPSOs	9.6% under 16, 49.2% 16-20, 31.1% 21-30, 5.6% 31-40, 4.3% 41-50, 0.3% 51-60 (18)	Black	3.24	Victim statements made to sexual assault clinic	Outside	Private dwelling	76.9%	7.1%	Stranger	18% oral rape 57.2% vaginal rape 16.7% multiple penetration 10.4% anal intercourse	81.6% vaginal rape 51.5% oral rape 80% multiple penetration 23.3% anal rape
	Case control													
UK														
10	Shackelford (2002)	No information given on the number of suspects.	247 cases of MPSOs	23	-	Duo	Coded data from national FBT database	-	-	-	-	-	Not reported	Not reported
	Cross sectional													
US														
11	Ullman (1999)	No information given on the number of suspects.	1029 MPPO cases 790 LSO cases	24.55	White	-	Data coded from victim statements made to Chicago Police	-	Outdoors	-	54.8%	-	Not reported	Not reported
	Case series													
US														
12	Ullman (2007)	No information given on the number of suspects.	807 LSO cases 176 MPPO cases	-	-	-	Victim statements acquired through male survey in Chicago	Indoors	-	-	35.2%	-	24.1% oral rape 81.3% vaginal rape 15.10 anal intercourse	89.1% vaginal rape 54.5% oral rape 89.1% anal rape
	Cross sectional													
US														
13	Woodhams & Cooke (2013)	240 suspects	89 cases of MPSOs	26	White	Duo	Coding of SCAS database of UK Police forces	-	-	-	-	Stranger	Not reported	Not reported
	Cross sectional													
UK														
14	Woodhams, Gillett & Grant (2007)	No information on the number of suspects.	495 allegations of lone and MPSOs (no info on ratio)	-	-	-	Coding of Met Police database	-	-	14.68%	4%	-	Not reported	Not reported
	Case series													
UK														
15	Wright & West (1981)	260 LSOs 104 MPSOs	240 LSO cases	12.2% under 16,	-	-	Coding of 6 Police	-	-	-	-	Stranger	Not reported	10.3% fellatio 7.7% oral rape

Case series	39 MPSO cases	53.1% 16-20, 20.4% 21-25, 4.1% 26-30, 6.1% 31-35, 2% 36-40, 2% over 40 (18)	databases from 6 counties	28.2% sexual fondling 30.8% kissing 7.7% anal rape 12.8% masturbation
UK				

*Studies using the same sample

** Studies using the same sample

Table 3: Study quality and risk of bias

Study	Overall quality	Broad population radius	Use of multiple populations (e.g. victims only)	*Ethical considerations	*Inclusion of consent form	Use of validated data (e.g. court trial / conviction)	*Detailed coding process	*Inter-rater reliability	*Blind coding	*Accounting for missing information	Sufficient sample size
1. Chambers, Horvath & Kelly 2010	66.6%									✓	✓
2. Chambers, Horvath & Kelly, 2013	80.5%						✓	✓		✓	✓
3. Horvath & Kelly, 2009	83.3%	✓	✓			✓	✓			✓	✓
4. Porter & Alison, 2004	83.3%	✓	✓	✓	✓	✓	✓	✓			✓
5. Porter & Alison, 2006	83.3%	✓	✓	✓	✓	✓	✓	✓		✓	✓
6. Da Silva, Woodhams & Harkins, 2013	100%	✓	✓			✓	✓	✓		✓	✓
7. Gidycz & Koss, 1990	80.8%	✓		✓	✓		✓	✓		✓	✓
8. Hauffe & Porter 2009	100%	✓	✓	✓	✓	✓	✓	✓			✓
9. Morgan, Brittain & Welch, 2012	92.3%			✓	✓		✓	✓		✓	✓
10. Shackelford 2002	66.6%	✓	✓			✓					✓
11. Ullman 1999	88.4%						✓				✓
12. Ullman 2007	75%			✓			✓	✓		✓	✓

13. Woodhams & Cooke 2013	80.5%	✓									✓
14. Woodhams, Gillett & Grant, 2007	92.3%		✓			✓	✓				✓
15. Wright & West 1981	55.5%	✓				✓				✓	✓
Total		9	7	6	5	8	11	8	0	9	10

*These variables may not necessarily be absent but may not have been reported on

Table 4: MPSO victim characteristics

Variable	Mean (SD)	<i>n</i>
Age	21.85 (4.8)	3162
Ethnicity (White)	66.42% (29.9)	3646
Recent alcohol consumption	49.6% (19.1)	2228
Recent drug use	31.01% (25.8)	2257
Employment	51.75% (8.3)	2903
Mental health vulnerability	20.04% (7.4)	364
Marital status (married)	14.23% (4.8)	2947
Family income (\$35-\$55,000)	37.2% (0.00)	44

Table 5: Results from statistical comparisons between lone and group offenders (based on studies with a control group)

Variables (%)	k^I	Lone Sex Offenders		Multiple Perpetrator Sex Offenders		Statistical Analyses			
		M (SD)	N (cases)	M (SD)	N (cases)	Odds Ratio	95% CI	I ²	Overall effect p
Ethnicity: White	6,9,11	27 (15.4)	1041	19 (10.8)	1277	0.62	0.44 to 0.89	43%	.009
Relationship to victim									
- Stranger	6,7,9,11	34 (44.2)	1085	63 (18.1)	1321	4.29	1.03 to 17.96	93%	0.05
- Known	6,7,9,1	67 (44.8)	1085	29 (24.5)	1321	0.12	0.01 to 1.46	93%	0.10
Recent alcohol use	8,11	51 (41.0)	850	45 (35.9)	1149	0.60	0.49 to 0.74	0%	<0.001
Recent drug use	8,11,12	64 (17.4)	1657	45 (31.2)	1325	0.41	0.12 to 1.40	97%	0.15
In a relationship	8,11	28 (16.9)	850	8 (2.8)	1149	0.25	0.04 to 1.47	93%	0.12
Employed	8,11	39 (33.2)	850	25 (27.0)	1149	0.48	0.40 to 0.57	0%	<0.001
							Total Mean I ² = 59.8%		
Victim									
Victim response									
- nonforceful verbal	7,12	46 (16.2)	851	64 (16.2)	220	2.24	1.60 to 3.14	0%	<0.001
- forceful verbal	7,12	16 (12.7)	851	35 (16.9)	220	2.74	1.97 to 3.79	0%	<0.001
- forceful physical	7,12	27 (7.1)	851	46 (17.7)	220	2.03	1.34 to 3.07	17%	<0.001
- nonforceful physical	7,12	7 (6.2)	851	43 (34.6)	220	10.80	6.39 to 18.23	0%	<0.001
							Total Mean I ² = 4.25%		
Offence Behaviours									
Location Approached									
- Outside	6,7,9,12	42 (37.6)	1102	51 (29.4)	468	2.21	1.41 to 3.47	58%	<0.001
- Inside	6,7,9,12	51 (14.4)	1102	50 (11.2)	468	0.94	0.31 to 2.85	96%	0.91
Location Victimised									
- Outside	6,9,12	23 (2.1)	1058	39 (18.5)	1277	2.07	0.87 to 4.92	91%	0.10

¹ Study numbers as per Table 2

- Inside	6,9,11	32 (23.9)	1041	39 (26.9)	1277	1.28	0.57 to 2.87	90%	0.55
Weapons used	9,12	10 (4.2)	946	21 (19.8)	1165	2.08	0.61 to 7.05	85%	0.24
Violence used	7,8,9	61 (11.4)	243	49 (24.4)	300	0.65	0.18 to 2.35	91%	0.51
Total Mean $I^2 = 96\%$									
Sexual Behaviours									
Fellatio	6,15	23 (16.3)	284	44 (21.9)	83	3.02	1.67 to 5.45	0%	<0.001
Oral rape	9,12,15	16 (9.7)	1186	43 (18.8)	351	4.27	3.24 to 5.63	0%	<0.001
Vaginal rape	9,12	26 (21.9)	946	56 (6.4)	312	4.56	1.08 to 19.23	96%	0.04
Kissing	6,15	50 (11.3)	352	61 (30.4)	151	1.68	0.13 to 21.91	96%	0.69
Anal intercourse	9,12,15	22 (17.2)	1186	45 (39.6)	351	10.02	1.29 to 77.70	96%	0.03
Masturbation	6,15	11 (7.1)	352	18 (18.4)	151	1.47	0.06 to 35.68	96%	0.81
Total Mean $I^2 = 64\%$									

Table 6: Themes of MPS offending

Authors	Themes
Chambers, Horvath & Kelly, 2010	Criminality
	Violence
	Intimacy
	Sexuality
Chambers, Horvath & Kelly, 2013	Manipulate Force
Porter & Alison, 2004	Dominance
	Submission
	Co-operation
	Hostility

Table 7: Results across group size (da Silva, Woodhams & Harkins, 2013; $n = 332$)

Variable	Lone offenders	Duo offenders	Group (3+) offenders
Age	29.47	26.85	24.5
Relationship with victim	99% strangers	73% strangers	81% strangers
Duration of offence	2.5 hours	3.5 hours	5.5 hours

Highlights:

- Studies with no control group may underestimate the substance misuse of MPSOs.
- The majority of MPSOs is more likely to be in early twenties and offended in pairs.
- MPSOs tended to approach their victim outdoors and be strangers to the victim.
- A number of differences in offence behaviors were found.