INSIGHTS AND ANALYSIS INTO WEAPON-ENABLED SEXUAL OFFENDING

by

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ABSTRACT

This thesis aims to investigate the empirical contribution of weapons within sexual offending with an aspiration of informing the two assumptions of offender profiling (e.g., homology and consistency). Chapter 1 explores the weapon literature before adopting offender profiling (broadly themes of 'planning' and 'violence') as a lens to interpret the phenomena. Chapter 2 focuses upon 1618 one-off single-offender single-victim serious sexual assaults. Twenty percent were weapon enabled. Comparing weapon versus non-weapon offenders, findings suggest no demographic differences although numerous around offence conduction. Chapter 3 adopts whether the weapon was found or brought as an innovative test of the homology assumption. There were no demographic differences, but many behavioural between the groups in particular around victim age. Chapter 4 presents a theory led conceptualisation of weapon-enabled sexual offending, results support the focus upon 'planning' and 'violence'. Chapter 5 investigates escalation and consistency of weapon violence within serial sexual offenders. One third of offenders are defined as increasing their use of violence over their series with key variables associated with this increase reported. There was mixed evidence around consistency - although linked 'crime pairs' were more consistent in weapon-related behaviours. The thesis concludes with a discussion of the theoretical and practical implications.

DEDICATIONS

To my family: mother, father, wife and daughter.

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INTRODUCTION

The overall purpose of the thesis is to investigate and develop new insights into weapon-enabled sexual offending. Weapon use as a topic has been included at the periphery of much statistical, theoretical and other psychological research, but rarely at the centre. As such, the applied relevance (or not) of the weapon within sexual offending is at present unknown. This is a curious omission given the continued growth of evidence based policing (Lum, Telep, Koper & Grieco, 2012) and related areas of study within forensic and investigative psychology, whereby the ongoing conversations seek to explore which specific crime scene behaviours could empirically contribute to investigative decision making (Alison & Rainbow, 2011). The thesis introduction aims to set out what is known currently about the prevalence of weapon related crimes both in general offences and sexual crimes; present the general theoretical background and then focus more upon the relevant specific investigative psychology research. The introduction will conclude with the overall aims of the thesis.

Statistics of weapon enabled crime

Within England and Wales, the Office for National Statistics publishes annual figures from two data sources. These are the Crime Survey for England and Wales (CSEW) (a representative face-to-face survey, conducted with approximately 50,000 individuals) and Police recorded crime data. The most recent annual iteration of the CSEW was published in April 2014 covering the year ending 2013 (Office for National Statistics, 2014a). This survey estimated a total of 7.5 million crimes against households and resident adults in the previous twelve months in England and Wales, of which there were 1.5 million violent incidents. In terms of weapon prevalence the

picture is not clear; there is no comprehensive data capture of weapons within crime in England and Wales. Up to 2009, the use of weapons was reported as part of the CSEW (then called the British Crime Survey and published by the Home Office). According to this data, weapons were used in about one in five (19%) violent incidents (e.g., wounding, assault and robbery). Although, given the low number of survey respondents within such violent categories and a total base size of 1205, caution must be exercised in interpreting such figures. Indeed, for this reason, the CSEW weapon figures have not been reported subsequent to 2009.

More information can be gleaned from Police recorded data; the latest figures indicate 3.7 million criminal offences in the year ending December 2013 and within these a total of 614,464 violent offences recorded. Since 2007, the Home Office has sought to collect specific knife data for violence, robbery and sexual offences. Data are also captured and reported by the Office for National Statistics, via Police data returns to the Home Office on offences involving the use of firearms. Of more relevance for the thesis is the recent Office for National Statistics (2014b) data release that had a specific in-depth focus upon the use of weapons within police recorded crime over the 12/13 year. Within this year, there were a total of 34,475 weapon-enabled offences, which can be broken down by weapon type as well as different offence types and injury. Only 0.2 per cent of the police recorded offences comprised of firearms (a total of 8135 offences), which was a fall of 15 per cent compared with the previous year. The firearms used were air weapons (36%), handguns (28%), rifles (15%), imitation firearms (15%) and shotguns (6%). Information was also captured as to how the firearm was used in these offences. In more than half of cases, the firearm was fired (55%) with a slightly lesser number only used as a threat (42%). In the remaining cases the weapon

was used as a blunt object (3%). Overall, around one fifth (21%) of firearm offences resulted in some type of injury to the victim. The majority of the other weapon offences involved either knives or sharp instruments, specifically a total of 26,340 offences, a fall of 15 per cent compared to the previous year. In terms of offences using knives, half (50%) were reported within a robbery offence, 43 per cent within actual or grievous bodily harm, 4 per cent within threats to kill, 1 per cent within homicide and finally, 2 per cent within rape and sexual assault. The number of sexual assaults involving a knife or sharp instrument remained similar in the year ending December 2013 compared with the previous year (91 and 90 respectively). Whereas, the number of rape offences involving knives or sharp instruments recorded by the police increased by 21 per cent, although the numbers appear to be very small - increasing from 195 offences to 236.

There are similar international statistics that present the prevalence of weapons within sexual offences and reach a comparable overall prevalence. To illustrate, between 1993 and 2001 in the United States, 8 per cent of rapes and sexual assaults involved a weapon (handgun, 3%; knife 3%) (Perkins, 2003). Greenfeld (1997) examined a range of databases held by the US Bureau of Justice Statistics; approximately 12 per cent of rapes involved the use of a weapon, specifically a gun (5%) or knife (7%). Rand and Truman (2010) present data from the National Crime Victimization Survey (a representative survey that collects information on a range of crime types) illustrating that weapons were used in 22 per cent of all violent crime. The bulk of weapons were within the robbery category as just under half (47%) of the 516,060 robberies involved a weapon. Ten per cent of rape/sexual offences (that is 12,970 out of 125,910 offences) involved a weapon.

Overall, the data appear to indicate that a minority of sexual offences (albeit approximately 1 in 10) are weapon-enabled, somewhat raising the question as to the value of exploring weapon use further. However, this would be an erroneous conclusion for a number of reasons. In terms of the reported relative infrequency of weapons, as a survey, the CSEW (and the comparable U.S. survey briefly mentioned) was not specifically designed to assess weapon use and the Office for National Statistics itself highlights the lack of robust capture of sexual offences (Office for National Statistics, 2014a). Additionally, in terms of police recorded crime, there has been considerable recent attention in terms of the dubious quality of data capture and crime recording (Office for National Statistics, 2014a). It is also worth highlighting that for crime to be 'counted' as a recorded offence, many stages have to be successfully negotiated. For example, the crime has to be reported, investigated effectively, suspects identified, witness and or victim cooperation maintained, passing evidential tests by the Crown Prosecution Service and finally having the offender found guilty. Many critiques have highlighted underreporting within such sexual crime (Office for National Statistics, 2014a). In this way, official statistics of weapons in sexual crime likely under estimate the actual number.

One of the more recent and creative examples examining the prevalence of weapons on sexual offending is the work of Langevin and Curnoe (2013). They used a case study approach and reported that 25 per cent of a sample of sex offenders used a weapon in their offence. This study was based upon a sample of over 1500 males referred for psychological assessment within Canada between 1966 and 2009. Indeed, the final report indicates that the weapon group presented as a disturbed group with higher levels of a range of conditions (i.e., psychosis, alcoholism and drug addiction)

and a more violent criminal history. This demonstrates the potential discriminative value of the weapon, raising the notion that weapon-enabled offenders may be different compared to non weapon offenders. The appropriate conclusion here is that official statistics, such as those highlighted are not best suited towards capturing weapon related information such as prevalence, and that other less frequent bespoke or unique data collection methods are more appropriate to generate insights. One could even argue that the Langevin and Curnoe (2013) sample, being of convicted sexual offenders is an even more select group and as a result of *less* practical value for investigations. In this way, the study of weapons has been hampered up to the present time given the over reliance on official statistics. However, there has been research that has sought to incorporate weapons (all be it in-part) that is able to demonstrate the value of such inclusion within a criminal standpoint.

Benefits and insights into the value of weapons

Weapons have been associated with criminal experience and reoffending in a number of studies (Davies, 1997; Wintemute, Drake, Beaumont, Wright, & Parham, 1998). To illustrate, Wintermute *et al*., (1998) in a 15 year follow up of offenders demonstrated that those with more previous convictions were more likely to be reconvicted within their study period for a firearms offence. Michie and Cooke (2006) presented results from a clinical sample of 250 prisoners from Scotland associating weapons with a number of psychological conditions. Factors such as psychopathy, childhood violence and aggressive fantasies were all associated with violence with a weapon. Similarly, Catanesi, Carabellese, Troccoli, Candelli, Grattagliano and Fortunato (2011) reported links between offender mental disorder, such as delusional disorder, and the use of sharp weapons. Simlar to the Langevin and Curnoe (2013)

research, this again serves as a reminder of the potential psychological and discriminative ability of the weapon.

There is mixed research in terms of weapons and the level of injury inflicted to the victim. To illustrate, a number of studies report increased victim injury, especially within specific victim types, when weapons are involved. Rogde, Hougen and Poulsen (2000) report that female victims of homicide within Scandanavia received more wounding than male victims. English, Retziaff, and Kleinsasser (2002) found weapons within sexual offences to relate to increases in violence and injury. Likewise, other research indicates the possible correlation between head/face wounding and multiple wounding being indicative of a relationship to the victim (Salfati & Canter, 1999; Haugen, Slungård & Schei, 2005). Conversely, Kleck and DeLone (1993) reported weapon enabled robbers inflicted less injury - the argument being that the possession of a gun appears to inhibit victim resistance and so perversely, the weapon reduced the probability of victim injury. Similarly, Block and Skogan (1984) examining violent assaults also report that as weapons become more deadlier, their actual physical use by offenders declined.

The study of victim injury also raises one of the broader public policy facets of such weapon use and victim injury. To illustrate, Halligan, Michael, Clark and Ehlers (2003) reported that victims of weapon related assault offences were more likely to present post-traumatic stress disorder (including measures of memory deficits and dissociation), and were also more likely to report greater perceived threat to life/of serious injury and fear/terror during the offence. This provides a timely reminder of insights gleaned so far, but also the benefits towards the wider public that can be

associated with weapons. That is, knowing more about weapon use in offending could be put to use within harm reduction, victim support and the prioritisation of weapon-enabled offenders given the risks to victims. This would appear to generate a compelling case to continue and expand the study into weapon use and offenders.

Theories of aggression and weapons

The aim of this section is to briefly outline the main theoretical components around weapons and in doing so set the backdrop for the thesis. One of the few weapon specific research pieces conducted is the in-depth literature review by Brennan and Moore (2009), in which they argue there are two potential theoretical approaches to understanding weapon use. First, they propose that weapons can be viewed within the overall violent act, thus implying theories of general aggression will account for the use of a weapon. Alternatively, they argue that weapon use could be something more complex and not be accounted for by the core theories of aggression, requiring additional layers, such as offender choice, to fully understand their use.

The biological theories of aggression apply to the former theoretical approach outlined by Brennan and Moore (2009). The biological and instinct theories range from Freud (2001), and the work that surrounded life and death instincts, to the work of Lorenz (1966), where aggression, and presumably the weapon, would be considered a necessary instinct for survival. There is research that presents evidence of human and non-human primates using weapons for offensive and defensive purposes (Goodall, 1986). Indeed, some research indicates that the use of weapons played an important role in the evolution of human hand-eye coordination and survival (Calvin, 1982). There is strong biological evidence around a predisposition towards violence and crime

from twin and adoption studies (Dionne, Tremblay, Boivin, Laplante, & Perusse, 2003), genetics and neuro-biology (Beaver, Nedelec, Schwartz, & Connolly, 2014; Plomin, 2001). In terms of sexual offending, whilst higher levels of testosterone have been reported in sexual murderers and sexually aggressive men in general, results are mixed and sex hormones have not been linked specifically to weapon use (Bain, Langevin, Dickey, Hucker & Wright, 1988; Langevin, Ben-Aron, Wright, Marchese & Handy, 1988). There are other evolutionary or sociobiological theories that can account for rape, child abuse and other violence which argue that violence is biologically related to an offender's desire to transmit their genes to future generations (Lightcap, Kurland & Burgess, 1982).

Indeed, as evidenced, there is strong evidence towards a biological predisposition towards or aggression or violent behaviour, although Brennan and Moore (2009) within their review argue that the offenders *decision* to carry or use a weapon cannot be accounted for by a biological approach and that any weapon specific framework needs to account for decision making, as well as the offender's aims and situational factors in more explicit detail. This is consistent with other critiques of biological accounts of violence; describing them as deterministic, lacking practical applications and unable to account for the dynamics of a violent and criminal act (Morse, 2011).

Delving deeper: criminally minded theories for weapon use

There are a number of theories that are more relevant in understanding weapon-enabled sexual offending and incorporate aspects absent from biological theories (e.g., decision making). In this manner, the introduction now seeks to narrow its own focus

and attempt to illustrate the additional nuance required in accounting for the weapon and explore theories that relate more explicitly to criminality, decision-making and weapon choice. The most relevant in the literature being: Social Learning Theory (Bandura, 1986), Rational Choice Theory (Cornish & Clarke, 1986), the Instrumental/Expressive model of violence (Block & Block, 1992) and the Organised/Disorganised model of violence (Douglas, Burgess, Burgess & Ressler, 2006). Each of these will be explored in turn.

Social Learning Theory

Bandura (1986) discusses how observations, models, rewards and punishments are key in shaping human behaviour, generating a model that has accounted for numerous behaviour ranging from parenting style (Simons & Burt, 2011) to criminal behaviours including rape (Feldman, 1993). One of the more frequent types of observational learning associated with aggression is that of violent television, film or video games, although the direct links to crime are weaker (see Browne & Hamilton-Giachritsis, 2005 for a excellent review). Likewise, observational learning ought to also apply to those who have witnessed or suffered violence themselves and set the conditions for a greater likelihood of committing violence themselves. To illustrate, there are associations between those people who have been sexually abused, especially boys, becoming sexually abusing teenagers and adults (Burton, Miller & Shill, 2002; Burton, 2003; Glasser, Kolvin, Campbell, Glasser, Leitch & Farrelly, 2001; Kaufman & Zigler 1987; Ryan, 1989). There is even evidence that some juvenile sexual offenders who were themselves victimised as children appear to use similar abusive methods as their abuser (Burton, 2003). In this way it is plausible that offenders could learn to use weapons - either through victimisation or by observing peers or family

members commit their crimes (i.e., successfully to act as an effective model) through the use of a weapon. Such a 'victim to victimizer paradigm' has received mixed empirical evidence (Rasmusseenm, 2012). One of the key challenges to this, and to the wider social learning perspective is the sheer number of victims (or others exposed to, for example, violent media) who never become offenders (Miccio-Fonseca, 2014) and the role of life stressors (e.g., illnesses, marital difficulties, hospitalisation, family suicide), which have been found to be more frequent in the lives of sexual offenders with previous victimisation than those without such victimisation (Miccio-Fonseca, 1996).

Rational choice perspective

The rational choice theory is a framework designed to investigate the decision-making of offenders. Cornish and Clarke (1986) describe a range of processes the offender makes in terms of committing crime (e.g., assessing their own needs or abilities or properties of the target and associated risks). Within the theory the offender is able to learn and modify their crime strategies over time and in this manner - a weapon could be a factor within this rationalising.

Beauregard and Leclerc (2007) applied the rational choice approach to semi-structured interviews conducted with 69 serial sexual offenders to explore the offence rationale - at the pre-crime phase (e.g., premeditation of the crime or forensic awareness of the offender), the actual crime phase (e.g., use of a weapon or restraints), and the post-crime phase (e.g., victim release or site location choice). Their results demonstrated that sex offenders were capable, up to a certain point, of an analysis of

costs/benefits. This rationale is applied to the use of weapons, as outlined by the below quote by one of the offenders interviewed:

'For night attacks, I used a knife since I was able to get close to the victim. Then she would be afraid to move not to get cut and was very easy to control. For day attacks, I had a fake gun. It was better to threaten a victim with a gun when she was further away; she knew I could shoot her from that distance, which isn't the case with a knife'. (Beauregard & Leclerc, 2007, p. 123).

On a similar note, Wilkinson and Fagan (2001) discuss the offender's arousal, aggression and then the series of decisions within the violent altercation itself. The decisions viewed within the expected outcome, expectations of success, value of the costs and the expectations of the costs. The work of Wilkinson and Fagan (2001) attempts to bring together aggressiveness as the driver or propensity towards the overall conflict, whilst stressing the importance of learning, decision making and offender risk assessment in the development of behaviours, including weapons, within violent situations.

In terms of weapon-enabled crime, the rational choice perspective provides a background to the decision making process of offenders that specifically contributes to weapon use. This could apply to the pre-crime (e.g., planning around victim approach and weapon choice), crime phase (e.g., how the crime will be conducted or the desire to harm the victim) and post-crime phase (e.g., threats to the victim to deter them from going to the police). Within such considerations would be factors such as the offenders' estimates of their own ability, aims, strength and challenge the victim may present. This

work advances the depth of the conversation around weapon use offending far beyond that of a biological propensity when discussing weapon-enabled offending.

Instrumental and expressive violence

Continuing the thread of offender decision making, the instrumental/expressive model of violence emphasises more so the offender aim's, and how this will impact upon the type of violence utilised. Instrumental aggression is a means to an end. The threat of aggression and any accompanying violence is deliberate and purposeful within the offence. Instrumental aggression is not driven by emotion; instead, it is the direct expression of goal-related behaviour (Bartol, 1991; Fesbach, 1964). In considering weapons, the instrumental function would be around obtaining goals, such as control of the victim, obtaining sexual acts or to facilitate successful completion of the offence (Kleck & DeLone, 1993; Smallbone & Milne, 2000). This has been demonstrated within psychological research. To illustrate; Canter, Bennell, Alison and Reddy (2003) identified a control domain within serious sexual assault where the offender perceives the victim as an inanimate object, to be trussed and controlled through the use of bindings, gags and a weapon - all of which are ascribed by the authors as illustrating an instrumental theme.

Expressive aggression is the counter balance to the instrumental aspect of the model, it is not specifically goal directed and is characterised by raw emotion and anger. Many researchers have included such anger as a driver of rape (Groth & Birnbaum, 1979). The aggression is perceived to involve an emotional component for the offender and potentially includes a perceived level of personal "rights" being wronged or perceived or actual retaliation (Bartol, 1991). Knight, Warren Reboussin

and Soley (1988) describe both pervasive anger and vindictiveness involving aggression either targeted globally or specifically against an individual. As previously highlighted, there is wider literature that demonstrates the use of expressive violence, such as offenders inflicting more injuries and head/face wounding against victims with whom they are in relationships (Haugen, Slungård & Schei, 2005; Pratt & Deosaransingh, 1997; Salfati, 2000; Salfati & Canter, 1999). The violence is deemed expressive as it exceeds what would be necessary in order to complete the offence and potentially the weapon can facilitate, enhance and express such feelings.

This model has been extensively used and adapted to understand the motivations of a wide range of offenders, including murder (Miethe & Drass, 1999, Salfati, 2000); juvenile and adult rapists (Hunter, Hazelwood & Slesinger, 2000; Smallbone & Milne, 2000), as well as adult and juvenile fire-setters (Canter & Fritzon, 1998; Santtila, Häkkänen, Alison & Whyte, 2003). It would appear there is genuine value within the instrumental/expressive model relevant to weapon use. Of particular interest here from an empirical viewpoint is that the weapon can feasibly relate to both instrumental (e.g., the threat of a knife to gain victim control thus enabling the offence) and expressive motivations (e.g., using a blunt object to inflict physical harm). The additional aspect to consider here is whether the expressive or instrumental aspect applies to the weapon itself (e.g., are some weapons intrinsically expressive or instrumental?) or the offender's motivation and aims. This is another weapon related area where the additional nuances have not been adequately researched. There have also been critiques of the instrumental and expressive model: to illustrate, the distinction between the two styles of aggression has been criticised on the grounds that both types of aggression are essentially instrumental in meeting an offender's goal. To

elaborate, Bandura (1973) noted that the assumption that expressive aggression is only to harm the victim is too simple, as aggressive acts can create a variety of results for the aggressor such as injuring one's opponent, taking control of a situation and asserting one's physical superiority over another, producing many benefits for the offender. That is to say, even expressive anger is likely to yield benefits that for the offender beyond merely harming the victim.

The Organised and Disorganised model

Related to the instrumental/expressive concept is the Organised/Disorganised model of violence. This was based on the work of the Federal Bureau of Investigation (FBI) and was rooted in their analysis of serial rape and homicide (Douglas, Burgess, Burgess & Ressler, 2006; Kocsis, Irwin & Hayes, 1998). One of the basic assumptions is that the crime scene will reflect the personality of the offender, specifically, either organised or disorganised. An organised offender is posited to demonstrate high levels of planning, such as planning the offence or bringing the weapon. The model assumes organised offenders would be older, socially competent and be in skilled employment. Conversely, a disorganised offender would not demonstrate planning, resulting in a chaotic, spontaneous offence, where the weapon would be more likely to be found at the offence. Such disorganised offenders are viewed as being socially immature, younger, unemployed and of below average intelligence.

The organised/disorganised model has not been welcomed by academia, having been described as lacking scientific rigour (Canter, Alison, Alison & Wentink, 2004). However, the benefits of the model are in the attempts to derive a relationship from how the offence is committed, which includes some consideration of weapons, and

relate them to offender characteristics. This is the entry point to what is known as offender profiling, a term that will feature heavily throughout the thesis, which can be defined as "a technique for identifying the major personality and behavioural characteristics of an individual based upon an analysis of the crimes he or she has committed" (p. 405) (Douglas, Ressler, Burgess & Hartman, 1986). The organised/disorganised model as previously highlighted, has been criticised, however, is worthy of inclusion in the thesis as it seeks to incorporate detailed aspects of weapons within the model to inform decision-making. The concept here is viable; according to the model there ought to be differences in whether an offender brings or finds their weapon, related to whether the offender is organised or not, which in turn leads to predictions around offender characteristics. This brings with it empirically testable hypotheses; unfortunately, at present, research has not sought to answer such questions investigating the worth of weapons within this offender profiling framework. Although, that is not to say that the offender profiling literature has not contributed to the understanding of weapons.

Offender profiling and weapons

As has been highlighted previously, the use of weapons within criminal behaviours has received relatively little focussed study, especially around the concept of identifying behavioural characteristics. More attention has been placed on examining the prevalence of weapons and other such basic statistics (Barlas & Egan 2006; Office for National Statistics, 2014a) as opposed to focussing upon the weapon itself as the unit of empirical analysis. This is a curious omission, especially within the arena of 'offender profiling' that seeks to specifically generate such insights.

Offender profiling can be described as an umbrella term for a number of different approaches (see Alison, Goodwill, Almond, Heuvel, & Winter, 2010 for an overview of the three primary methods). This premise brings with it a number of applied benefits for police staff around issues such as suspect identification or resource prioritisation (Goodwill & Alison, 2007). Offender profiling rests on two core assumptions (Alison, Bennell, Mokros, & Ormerod, 2002). The consistency assumption would predict that offenders show a degree of consistency in their crime scene behaviours over a series. The homology assumption would suppose that the manner in which a crime is committed is related to the characteristics of the offender responsible, and the more similar the crime scene of two offenders, the more similar their characteristics should be. Equally, if the behaviour displayed in two crimes differs in key areas, one would expect the traits of the two offenders responsible to be different. Without these assumptions holding it would be impossible to make accurate predictions about an offender's characteristics based upon a given crime scene. There is no research reason why these two assumptions would not equally apply to the use of weapons within offending, opening up a new focus of study for weapons *and* the assumptions.

The homology assumption would predict offenders who use a weapon ought to be demographically different to offenders who do not use a weapon within their crime. In this way, additional research could be directed towards comparing these two groups (weapon and non-weapon) to identify differences, which if found, would assist investigators in suspect prioritisation. That is, assisting police or investigators to narrow down a pool of potential suspects to facilitate the overall investigation. The consistency assumption supposes that offenders are consistent in their behaviours over a crime

series, and, as such, presumably weapon use would also be consistent. Again, knowing an offender was weapon-enabled and (presumably) would remain so within their criminal career could benefit the police in a number of areas. For example, this could be in terms of crime linking, which relates to the ability to identify whether unsolved crimes are conducted by the same offender, or resource prioritisation, enabling police to identify potentially risky or harmful offenders, such as those that will continue to use weapons and may inflict increased victim harm. In this way, one could argue that improving decision-making around sexual offence cases involving weapons or the risk of increasing violence would be of *particular* interest for police forces. It is also worth reflecting here on some of the previous research set out in the introduction that has made associations between weapons and recidivism, mental disorder and injury to the victim, all aspects that are likely to increase the need for the police to efficiently resolve such cases.

Unfortunately, there has been little empirical research into the two assumptions underpinning profiling (in terms of homology and consistency), which has incorporated weapons. The research that exists into the homology assumption has proved inconclusive and generally reported little evidence for the assumption within a range of offender types such as rapists, arsonists and robbers (Doan & Snook, 2008; Goodwill & Alison, 2006; Mokros & Alison, 2002; Woodhams & Toye, 2007). Whilst it has been demonstrated that sexual offenders demonstrate levels of consistency within crime scene behaviours (Woodhams & Labuschagne, 2012), weapons and their use have not been given specific attention. Of interest here and inversely related to the concept of offender consistency is the work of Warren, Reboussin, Hazelwood, Gibbs, Trumbetta and Cummings (1999) who explored the escalation of violence within serial sex

offenders. They demonstrated that rapists who were White, used profanities and raped for longer periods of time in their first offence were more likely to escalate in the use of subjective blunt force over time. This research holds practical applications in terms of risk assessment and harm reduction.

Overall, the lack of consensus towards both homology and consistency within offender profiling appear to hold serious ramifications for the overall worth of the concept. However, Goodwill and Alison (2007) have argued that the assumptions may hold in *some cases* and not others and as such the assumptions are still a valid direction for study. Going further, they argue that certain crime scene behaviours may be more expressive of particular styles of offending, which in turn are more amenable to be profiled, and illustrate themes such as violence and planning as particularly viable for profiling. As they outline - "the real challenge [for profiling] is to identify what kinds of behaviour should be used to profile what kinds of characteristics." (p. 838). See also Mokros & Alison (2002) for a similar conceptual discussion. The question the thesis seeks to explore, and one that has not been adequately addressed before, is the efficacy or empirical contribution of weapons within this offender profiling remit (e.g., the homology and consistency assumptions). At the moment it is unknown whether there is any practical value pertinent to offender profiling and police investigations of weapon-enabled offences.

There have been a number of research pieces that can be described as being within the investigative or offender profiling lens that have included weapons - albeit inadequately. To illustrate, one of the most notable psychological typologies within offender profiling (Canter, Bennell, Alison & Reddy, 2003) highlights behavioural

themes around control, violence and degrading exploitative behaviours within sexual offending. However, the study only included one variable in terms of weapons - that of the weapon being 'used to control', which simply does not capture the nuance and different potential uses of the weapon. Similarly, The Federal Bureau of Investigation (FBI) has conducted relevant research here, such as the work of Hazelwood and Burgess (1987), which focuses upon issues of power, reassurance, anger and excitation as motivations for sexual violence. Weapons are occasionally mentioned, but not empirically or as the unit of analysis. For example, offenders motivated by power are described as being motivated by their own sexual doubts or inadequacy and may begin their offences with no weapon but eventually progress to bringing a weapon or viewing the weapon as an extension of their personality (Keppel & Walter, 1999). Elsewhere, the work of Groth and Birnbaum (1979) focuses upon anger, outlining that such offenders may be more likely to attack using fists or weapons of opportunity. However, again this was not subject to empirical research.

One of the main criticisms of the previously highlighted Brennan and Moore (2009) literature review is the omission of investigative or profiling research that seeks to examine weapon use through a forensic lens. The need to incorporate profiling and such investigative research in greater depth in terms of weapons as compared to contemporary weapon reviews (e.g., the Brennan & Moore piece) led to what would eventually become Chapter 1.

Structure of the Thesis

Aims

The aim of the thesis was the generation of information and research that may be able to assist police and investigations of weapon enabled sexual offending. As described, as of yet, there has not been adequate research around the concept of offender profiling specifically using the weapon as the unit of analysis. In this way the two core assumptions of offender profiling, the homology and consistency assumptions, are a main focus of the thesis.

The thesis is organised into six chapters. Chapter 1 sets the scene for the thesis by reviewing the relevant literature on weapons within crime and exploring the motivations of weapon use drawing upon 'offender profiling' as a relevant lens which could underpin motivations around weapon use. Chapter 2 presents an analysis of a total of 1618 sexual offenders highlighting the prevalence of weapons and identifying the differences in how the offence was conducted between weapon and non weapon-enabled sexual offenders, discussing the findings with reference to the homology assumption. Chapter 3 continues to explore weapon use, but focuses upon one specific aspect, weapon obtainment (i.e., whether a weapon was found at or brought to the crime scene) for empirical study and learning. This chapter highlights the nuance within the study of weapons and again discusses the implications of whether offenders bring or find their weapon in the context of the homology assumption. Chapter 4 returns to themes identified within Chapter 1 to present and tests a theory led conceptualisation of weapon enabled sexual offending through the use of Multi-Dimensional Scaling, identifying evidence of planning and violence as the primary themes of weapon enabled sexual offending. Chapter 5 changes focus to a test of the

consistency assumption with a sample comprised of 155 serial sexual offenders and explores behavioural consistency and the escalation of violence involving weapons, themes that hold direct practical relevance for investigators in terms of prioritising risk and crime linking. Chapter 6 discusses and reflects upon the preceding chapters in terms of learning. Indeed, the key thread throughout the chapters is the innovative and almost exclusive focus on the weapon as the object of study aligned towards a clear gap within the investigative research and the advancement of the empirical study of the principles of offender profiling by doing so.

Specific aims of thesis

1. To review the relevant literature pertaining to weapon use and specifically explore the offender profiling literature as a more appropriate lens to improve understanding of weapon use.

2. To explore the prevalence of weapons within apparent one-off sexual offenders and explore differences between weapon and non weapon-enabled offenders in line with the homology assumption in terms of demographics, how the offence was conducted, and seeking to determine which crime scene behaviours are able to predict weapon use.

3. Investigate whether weapon obtainment (i.e., if it is found or brought) by one-off sexual offenders can provide valuable information for investigators. In particular, to capture the basic frequency of weapon obtainment and test for differences between offenders that found versus brought the weapon in line with the homology assumption.

4. Explore the use of weapons within the crimes of serial sexual offenders in respect of the consistency assumption. Specifically, to investigate the degree of behavioural consistency and escalation of violence involving weapon related behaviours.

Ethical Approval

Subsequent to 2009 University STEM ethics approval was required for Doctoral research. Prior to this, approval could be obtained via other routes, and in the current case, given the thesis commenced in 2006, approval for the research was obtained from the Serious Crime Analysis Section (SCAS) of the National Crime Agency prior to data being received. This took the form of an original research proposal submitted to SCAS in August 2006 that outlined the proposed direction and covered issues such as data security. The proposal was initially rejected (March 2007) based upon the perception that weapons were a small aspect of such offences and the perceived lack of value in the study. After a resubmission in 2007 (April) the research was accepted (May). See Appendix I for the original, revised and SCAS acceptance e-mails.

In addition, the final draft of each chapter using SCAS data (i.e., Chapters 2-5) was submitted to SCAS for peer review and received approval. In this way, each of the four research chapters received individual clearance.

Samples

Two samples were obtained, providing retrospective data for empirical study. The samples met the different aims being explored: one sample explored 'one-off', lone sexual offenders; the second, serial sexual offenders within England and Wales. The Serious Crime Analysis Section (SCAS) of the National Crime Agency provided both samples from the Violent Crime Linkage System (ViCLAS).

The origin of ViCLAS dates back to the mid-1980's, in which the Canadian Police decided it required more detailed data capture around serial crime after a number of complex serial homicide investigations. The final version is based upon a series of standard questions around both offence and offender's behaviour that the investigator collects and inputs into a computer system resulting in a substantial database of sexual and violent crime (e.g., solved and unsolved homicide, sexual assaults and a range of other violent crime). The final ViCLAS question booklet (e.g., the questions answered around the offence) is not in the public domain due to the sensitive nature of the investigations. The method of populating the database differs between the UK and Canada. The UK SCAS incorporates extensive quality assurance and training procedures in terms of ViCLAS data entry. The main difference being that trained crime analysts, as opposed to police officers or investigators enter data. A quality control guide assures consistency in data entry.

The first sample, comprised of 1618 serious sexual assaults, was received mid-2008 and is used for Chapters 2, 3 and 4. The second data sample comprising of 155 serial sexual offenders was received in 2010 and is used for Chapter 5.

STATEMENT OF AUTHORSHIP

Chapters 1[1] and 2[2] have both been published and Chapter 3[3] submitted for publication. Each chapter is standalone. Repetition has been avoided as much as possible in terms of each individual chapter, although given the shared focus upon weapons and the use of two datasets between four data papers, some overlap is unavoidable, particularly in the method sections. The authorship on the published or submitted articles indicates collaborative working. I am the primary author of each of the chapters. Other authorship also reflects the changes in PhD supervision. Alasdair Goodwill is a named author on Chapters 1 and 2 (and would be named on Chapter 4 if submitted). Louise Dixon is named on Chapters 2, 3 (and 5 if submitted). Jessica Woodhams is named on Chapter 4 (and 5 if submitted).

[1] Dawson, P., & Goodwill, A. M. (2013). A Review of Weapon Choice in Violent and Sexual Crime. *Beijing Law Review, 4*(01), 20.

2 Dawson, P., Goodwill, A. M., & Dixon, L. (2014). Preliminary insights and analysis into weapon enabled sexual offenders. *Journal of Aggression, Conflict and Peace Research, 6*(3), 174-184.

[3] Dawson, P., Woodhams, J., & Dixon, L (submitted). Whether the weapon is obtained or found at the crime scene - implications for offender profiling and the homology assumption. *Journal of Investigative Psychology and Offender Profiling.*

CHAPTER 1

A REVIEW OF WEAPON CHOICE IN VIOLENT AND SEXUAL CRIME

Chapter rationale

Chapter 1 attempts to set the scene for the thesis and explore the relevant literature around weapons, both exploring general violence and then sexual offending. Owing to the paucity of weapon specific theories, the review draws upon the considerable body of 'offender profiling' literature as a relevant lens through which to arrive at a suitable theoretical framing for the overall research.

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A Review of Weapon Choice in Violent and Sexual Crime

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The concept that weapon choice and use may play a valuable role in differentiating between offenders is one that has not been well explored in current criminological or psychological thinking. The key aim of the current paper is to discuss the role of weapon choice and use in the application of offender profiling. Relevant research is identified though a literature review: initially considering a broad range of offences and then narrowing the focus on the specific case of violent and sexual offences. The review highlights several key findings which are then conceptualised through the offender profiling literature. In the discussion, the paper argues that there is considerable merit in the consideration of weapons within profiling violent and sexual offenders and concludes with proposed dimensions (planning and emotional use of the weapon) that illustrate the range of motivations that may aid in discriminating offenders.

Keywords: Weapon; Violence; Sexual Offences; Offender Profiling

Introduction

Weapon use in sexual and violent offences is a key consideration for police agencies and governments alike (Home Office, 2011). For the current paper, a weapon is defined as "an object used to cause or threaten injury to another". Prevalence data pertaining to weapon enabled crime exists for England and Wales through Home Office statistical releases utilising both public survey and police statistics. For example, in the year ending March 2012, 51 per cent of attempted murders, 22 per cent of robberies, and one percent of rapes involved a knife or sharp instrument (ONS, 2012).

Prevalence data is collected in many countries (Catalano, 2005; Home Office, 2011; Australian Bureau of Statistics, 2004) and is valuable for understanding trends, developing policies or preventative strategies and the like. However, it reveals little on the motivations or whether weapon type has the ability to differentiate between offenders.

The question at hand is whether examining weapon use may benefit police or criminal investigations. This is a question that has not received adequate investigation: there is a paucity of weapon enabled research in current criminological and psychological thinking. As an example—a recent review conducted by Brennan and Moore (2009) was a valuable step forward relating to the history and theory of weapons, although did not cover the potential value of examining weapon use within a police context. Furthermore, the Crime Classification Manual (Douglas, Burgess, Burgess, & Ressler, 2006), one of the most comprehensive texts concerning the classification of crime lacks an in-depth discussion regarding weapon use and what it may mean for the police.

One area where weapon use has been previously discussed beyond that of prevalence is within the offender profiling literature. There have been a number of psychological of investigative typologies that incorporate weapon use to varying degrees. The most notable of the psychological based typologies are Canter, Bennel, Alison and Reddy (2003) and Salfati and Taylor's (2006) multidimensional scaling thematic representations of stranger rape and sexual assault, respectively. From an investigative viewpoint the Massachusetts Treatment Center's (MTC: R3) (Knight, Warren, Reboussin, & Soley, 1998) classification system for sexual offenders and Groth's (1979) power and anger typology have been recently used the by Federal Bureau of Investigation (Hazelwood & Burgess, 1987) for application to offender profiling. The organised/disorganised split has some consideration of the weapon (Ressler, Burgess, & Douglas, 1988). While it is not the remit of the paper to critically evaluate offender profiling, a consideration of these typologies and how they incorporate weapon use will be valuable in supplementing discussions regarding the underlying motivation of weapon use.

This paper seeks to go beyond prevalence data and explore the motivational, demographic and psychological aspects of offender weapon use. The aim is to examine the potential value for criminal investigations in considering the use of weapons within sexual and violent offenders.

Methodology and Results

A search of the literature was conducted to examine the issue of weapon use and offenders. The electronic sources included Swetswise, Ingenta, Silverplatter, Cambridge Scientific Abstracts and Zetoc. The basic search terms used in each were "*weapon use*", "*weapon choice*", "*weapon & offende*r" and "*rape & weapon*". A wide range of articles were identified through the searches conducted. The results can be grouped into a number of key themes that we now turn to.

Youth Violence and Weapon Use

A number of identified research studies examined weapon use within youth samples reporting weapon to be relatively common (Barlas & Egan, 2006; McCluskey, McCluskey, & Bynum, 2006; Thurnherr, Michaud, Berchtold, Akre, & Suris,

2009; Simon, Crosby, & Dahlberg, 1999). Kuntsche and Klingemann (2004) examined weapon carrying in a representative sample of 1549 Swiss school pupils reporting that 17% had taken a weapon to school. Clubb *et al.* (2001) reported that of 6400 US ethnic minority pupils, 30% had used weapons in fights. Adolescents who reported living full-time with a parent or parent figure, and those who reported religious observance or beliefs, were less likely to report violence involvement. All violence related behaviors were more common among male than female adolescents.

Malek, Chang and Davis (1998) examined 297 cases of school fights involving 7th grade students in three US communities. One or more weapons were reported to have been used within 43% of all reported fights. Those fights with more than 5 individuals, intoxicated students or gang involvement were the predictors of both weapon use and injury. Benda and Tollett (1999) examined 224 criminal youths in the United States examining factors associated with reconviction. Carrying a weapon was one of the main predictors of reconviction. Hill, Howell, Hawkins and Battin-Pearson (1999) examined youths and gangs. The key risk factors for gang involvement were neighbourhood, family, school, peer and individual differences.

Langstrom and Grann (2000) found that sexual recidivism of adolescents was associated with index offence weapon use, previous criminality, psychopathology and conduct disorder. They also identified weapon use as a key predictor of future diagnosis of conduct disorder in adolescence. Conduct disorder is characterised by behavioural and emotional problems and can be defined as a repetitive and persistent pattern of behaviour in which the basic rights of others and of major society are violated (APA, 1994). In order to receive a diagnosis the symptoms must cause significant impairment to the social, academic or occupational functioning and be present within specific timeframes. The major symptoms include:

- aggression to people or animals (bullying, cruelty to animals and the use of a weapon);
- destruction of property (deliberate);
- deceitfulness or theft (broken into others property);
- serious violations of rules (run away from home).

Conduct disorder has clear associations with criminality (due to the behaviours such as theft, weapon use, and general anti-social behaviour) but also co-morbidity with other problems such as Attention Deficit Hyper Disorder (Loeber, Burke, Lahey, Winters, & Zera, 2000) or substance misuse (Boys et al., 2003). This has important implications in the differentiation of offenders by weapon use as the onset of criminal behaviour, weapon use and conduct disorder are seemingly correlated. Indeed, criminological research indicates that adult offenders that are prolific offenders are significantly more likely to have begun their criminal career at a younger age than the general offending population (Farrington, 2005).

Domestic Violence

The search revealed a number of relevant articles concerned with weapon use in cases of domestic violence. Sorenson and Wiebe (2004) examined 417 women in 600 shelters reporting that words, hands and feet were the most common method of assault. Thompson, Saltzman and Bibel (1999) reported that weapon use was positively related to injury levels in domestic violence. Murrell, Merwin, Christoff and Henning (2005) explored weapon use in 362 male domestic violence perpetrators. Specifically the self-report of viewing parental violence incurporating weapons as a child was explored. Men who reported witnessing threat or the use of a weapon in parental violence were more likely than not to have threatened to use a weapon themselves. However, in the sample most men that used weapons did not report witnessing such weapon related violence as a child.

Haugen, Slungård and Schei (2005) examined 162 females in a sexual assault health service between 2000 and 2003 finding that type and severity of the sexual assault did not differ significantly according to the victim-perpetrator relationship. However, the victims of known offenders only reported life-threatening violence and the use of a weapon. Research also found that domestic violence offenders that used a weapon during their offence were more likely to be arrested than individuals who did not (Houry, Reddy, & Parramore, 2006; Hassani, Houry, Parramore, Heron, & Kellermann, 2004).

Greene, Maas, Carvalho and Raven (1999) examined gender-specific patterns of male and female victims of assault. Specifically, a cohort of 91 female assault cases was compared with a control group of 706 males with similar injuries resulting from blunt assault trauma. Females were more likely to be admitted with soft tissue injury only but no fracture, less likely to be assaulted with a weapon, and unlikely to be involved in an altercation, gang violence, arrest, or robbery. Females were also less likely than males to be injured while intoxicated. The incidence of specific injury patterns and outcomes, however, were similar between the male and female groups.

General Violence and Weapons

Wintemute, Drake, Beaumont, Wright and Parham (1998) examined the previous criminal record of individuals purchasing handguns to explore future criminal behaviours. Of the 5923 authorised purchasers, 3128 had at least one conviction prior to handgun purchase. In a 15-year follow-up study the handgun purchasers with at least one prior conviction were more than seven times as likely as those with no prior criminal history to be charged with a new offence after handgun purchase. Those with two or more prior convictions for violence were at greatest risk for offences of murder or non-negligent manslaughter, forcible rape, robbery and aggravated assault. This link between weapons and an increased likelihood of recidivism is supported elsewhere (Ministry of Justice, 2011; Huebner, Varano, & Bynum, 2007).

Pratt and Deosaransingh (1997) examined gender differences for homicides in the United States. Females were more likely to be killed by their spouse of intimate partner, where men were more likely to be killed by strangers. A higher percentage of women than men were killed with a blunt object, a personal weapon (i.e., fists, feet, and teeth), or other weapon (25% versus 11%). Men were more likely than women to be killed by a firearm, in a public place and whilst a crime was being committed.

Moskowitz, Laraque, Doucette and Shelov (2005) examined the relationships between US youth homicide victims aged zero to 19 years between 1976 and 1999. A total of 70,258 victims were studied. Murdered girls were 3.6 times more likely to have been killed by family members and 21.3 times more likely to have been killed by intimate partners than murdered boys. Handguns were more likely to be used during homicides committed by strangers.

Smith (2003) examined the nature of robbery in England and Wales based on an investigation of over 2000 crime reports and witness statements across seven police areas. Weapons were present in a third of all robberies—particularly when the offender used a confrontational victim approach. Knives were the most frequently used weapon type, being used in 1 in every 5 personal robberies.

Wells and Horney (2002) examined over 2000 violent and potentially violent events described by offenders to assess the role of weapons. The authors reported that the offenders intent to injure did not appear to play a role in determining the need for a weapon and firearm attacks overall reduced the risk of injury. Kleck and DeLone (1993) conducted logistic regression analysis on over 4500 robbery incidents reported in the 1979-1985 period. Unarmed physical force against the robber and trying to get help, attract attention, or scare the robber away generally increased the likelihood of victim injury. The robber's possession of a gun appeared to inhibit victim resistance and so perversely, the offender using a gun reduced the probability of victim injury. However, even controlling for victim resistance, gun possession was associated with a lower rate of injury to the victim. Robbers with handguns were much more likely to complete their robberies than those with knives or other weapons and unarmed assailants. However, once an injury occurred, those with a weapon were more likely to cause greater levels of harm. This seems to indicate the functional value of weapons, namely to control victims and facilitate completion of the robbery.

Murder—Suicide, Child Homicide and Filicide

A number of studies examined weapon use within homicide-suicide (a murder followed by the suicide of the murderer).

Easteal (1994) examined Australian homicide-suicides reporting that if the offender was an estranged male from his partner, born outside of Australia, who used a gun as the weapon and killed more than one victim, or was older with an ailing wife, he was more apt to commit suicide. Lecomte and Fornes (1998) examined this crime within Paris and its suburbs between 1991 and 1996. During the six-year study period, there were 56 cases involving 133 victims. In 45 events (80%), the offenders used a gun for both the homicide and suicide. A knife was used in only four murders, strangulation in four other cases, with poisoning, arson, or beating occurring in one case each. In nine cases, the offender used a different weapon for the suicide than for the murder. Among firearms, handguns were more likely to be used than shotguns.

Lyman *et al.* (2003) investigated the epidemiology of child homicide in Jefferson County, Alabama for children that were born and died between 1988 and 1998. Homicides primarily resulted from an angry impulse (61%), with hands the most common weapon (61%). This apparently links high emotion such as anger to impulsive personal attacks, where planned use of a weapon is not apparent. Lewis, Baranoski and Buchanan (1998) reported 60 cases of maternal filicide and weapons were used by one in four cases. Psychotic women were 11 times more likely to kill with a weapon.

Cross Cultural Comparisons

A small number of studies conducted cross-cultural investigations into weapon use. Eisner and Wikström (1999) compared two European capitals (Stockholm and Basle) reporting that the presence of weapons increased the risk of violent events. Friday, Dussich, Okada and Yamagami (2000) compared a US and Japanese sample reporting that US participants were more likely to state that they would use weapons in response to a threat.

Boots and Heide (2006) investigated 208 cases of parricide involving weapon use; 40% were firearms, knives 21% and other objects (12%). Cultural differences were evident in that US parricides were more likely to use firearms (49% vs. 21%) and multiple weapons (14% vs. 9%) than non-US parricides, which showed a higher frequency of knife (27% vs. 18%) and blunt weapon use (19% vs. 9%).

Rogde, Hougen and Poulsen (2000) examined homicide by sharp weapons in two Scandinavian capitals between 1985 and 1994. In total, 33% of homicides used a knife. Female victims on average received lesions in three to four anatomical regions compared to male victims who received most frequently in one. The authors hypothesise that a possible explanation for this was that the female victims more often were killed by someone closely related to them, and that multiple wounding was evident when the perpetrator was emotionally related to the victim.

Weapon Use against the Elderly

Bachman (1998) examined violence against the elderly over a two-year period. It was found that older victims, particularly women, were more likely to sustain injuries as the result of a violent attack using a weapon and more likely to require medical care for these injuries. Safarik, Jarvis and Nussbaum (2002) and Safarik and Jarvis (2005) examined the homicide of elderly women. These studies devised a scale of injury and reported that there was a predominate use of personal weapons (feet, fists) and firearms were only evident in 3% of cases. In the cases present, 10% of offenders to conduct the sexual murder of elderly females brought weapons to the scene.

Weapon Use in the Mentally Disordered

A number of studies examined the weapon use of individuals with mental disorders, examining whether symptom type was associated with weapon type. Stueve and Link (1997) reported that weapon use was elevated in psychotic and bi-polar community based individuals with mental illness. Swanson, Swartz and Van Dorn (2006) conducted a large-scale study into the violent behaviour of 1410 schizophrenic patients finding that positive symptoms were associated to high levels of violence, including the use of weapons.

Michie and Cooke (2006) examined 250 Scottish prisoners who were subject to a range of psychological assessments. A nine-question tool, interviews, the Psychopathy Checklist-Revised (PCL-R) and a number of other scales were used with the aim of developing a hierarchical model of violence. Two factors provided the best fit to the violent data, namely "violence with a weapon" and "violence without a weapon". Violence with a weapon was particularly associated with psychopathy, a history of childhood violence and the frequency of aggressive fantasies. Violence without a weapon was associated with level of anger (NOVACO scale), the Barratt impulsivity scale and age at interview. The authors likened this distinction to predatory aggression (weapon use) compared to affective aggression (non-weapon use). The authors also note that further

work examining the difference choices of weapon (i.e. knives vs. guns) may be useful in further model refinement.

Catanesi et al. (2011) examined psychopathology and weapon choice, reporting a significant correlation between some mental disorder and weapons. A strong correlation was reported between delusional disorders and sharp weapons, whereas depressive disorders were more strongly associated with asphyxia. Organic disorders were highly correlated with the use of blunt weapons.

Sexual Offenders and Weapon Use

Greenfeld (1997) examined a range of databases held by the US Bureau of Justice Statistics. Offenders were five times more likely to use a gun in the rape of a stranger (10%) than in the rape of a family member (2%). Rapes committed by African-American offenders against African-American victims were about twice as likely as Caucasian against Caucasian rapes to involve the use of a gun or knife (14% vs. 7%). Interracial rapes were equally likely to use a gun or knife (22%).

Woodhams, Gillet and Grant (2007) examined stranger juvenile sexual offences. In particular, how victim characteristics and the number of suspects affected the use of physical violence and the occurrence of penetration in 495 allegations of sexual assault. Victims experiencing penetrative offences were significantly younger than victims to receive no penetration. Group assaults were associated with a higher level of violence and penetration as compared to lone individual offenders. However, in this study victim age was not found to be associated with weapon use or number of assailants.

Beauregard and Leclerc (2007) interviewed serial sexual offenders whom discussed issues around control, intimidation and the functional value of weapons before, during and after their offence. Guay, Ouimet and Proulx (2004) studied individuals (sexual and non-sexual offenders) and their processing through the US Criminal Justice System (CJS). Weapon use was reported to be of principal importance, in that offenders using weapons were more likely to be treated more harshly and sent to custodial institutions. This seems to indicate that courts view weapon use as a measure of increased severity and substantial risk to the community. Accordingly, Bachman (1998) reported that the key factors that increased the likelihood of a rape being reported to the police were weapon use and severity of injury. In an examination of young sexual offenders (n = 46) in Sweden, Langstrom and Grann (2000) found recidivism was low (20%) but significantly associated with previous criminality, conduct disorder, psychopathy and weapon use.

Brecklin and Ullman (2001) reported that alcohol use prior to rapes (n = 362) was associated with an outdoor assault, night-attack, stranger attack and increased victim resistance. There was no difference between pre-assault alcohol use and offender aggression or weapon use (11% of alcohol and 10% non-alcohol rape groups). Coker, Walls and Johnson (1998) examined 213 female and 664 male victims of sexual assault in South Carolina between 1991 and 1994. On average, females received more injuries than males and were at significantly greater risk of severely violent, non-penetrative sexual assault, in offences involving multiple assailants, sodomy, weapon use, being kidnapped, stranger offender(s) and offender intoxication. Ruback and Ivie (1998) examined information about the rapes of 2526 adult females from the records of a rape crisis centre, finding that attacks by strangers were more likely to involve a weapon and to occur outdoors than were attacks by non-strangers and victims were less likely to physically resist strangers than non strangers.

English, Retzlaff and Kleinsasser (2002) developed the Colorado Sex Offender Risk Scale. A sample of 494 sex offenders was followed for an average of 30 months. A risk scale was developed based upon criminal and therapeutic outcomes. The final risk scale included a range of factors such as previous youth convictions, denial in therapy, sexual deviance in therapy and weapon use during the crime. The risk scale provided significant relative risk ratios against program failure at 12 and 30 months for those using weapons during their offences.

Vinogradov, Dishotsky, Doty and Tinklenberg (1988) interviewed 63 adolescents accused of rape reporting that the "typical" rapist often had a criminal record and carried a weapon. Quinsey and Upfold (1985) examined adult male rapists that had been referred to a maximum-security psychiatric institution. Rapists were more likely to complete the rape when the attack was conducted in an inside location, with a weapon and not against a stranger.

Pino and Meier (1999) found that the rape of males were more likely to involve a weapon, although there was no gender differences regarding injury received. Cohen, Frenda, Mojtabai, Katsavdakis and Galynker (2007) reported offenders against children were less likely to use a weapon. Muram, Hostetler, Jones and Speck (1995) reported that sexual assaults versus females more often involved weapons and physical injury in comparison to young victims, indicating that weapon use may be associated to victim age.

Motivations of Weapon Use

As we have seen research pertaining to weapons would appear to be relatively broad in nature covering many crime types, although there has been some valuable research that may be of value to a police force (e.g. criminal history of weapon enabled offenders). Moving forward, while there has not been extensive research on weapon use within an offender profiling context, there has been several investigative and psychological typologies that incorporate weapon use. The most notable of the psychological based typologies are Canter, Bennel, Alison and Reddy (2003) and Salfati and Taylor's (2006) multidimensional scaling thematic representations of stranger rape and sexual assault, respectively. From an investigative viewpoint the Organised/disorganised (Ressler, Burgess, & Douglas, 1988), the Massachusetts Treatment Center's (MTC: R3) (Knight, Warren, Reboussin, & Soley, 1988) classification system for sexual offenders and Groth's (1979) power and anger typology have been recently adapted the Federal Bureau of Investigations (FBI) (Hazelwood & Burgess, 1987) respectively, for application to offender profiling. These typologies, although approaching the topic from different perspectives do have considerable overlap in underlying theory. Therefore, rather than a series of separate discussions of each typology, the main underlying themes will be highlighted and discussed in relation to weapon use.

Control of the Victim

An element within a number of the typologies is the issue of achieving control and compliance of the victim. According to Canter, Bennel, Alison and Reddy (2003) offenders in the *control* domain view the victim as an inanimate object, one that

needs to be trussed and controlled. The use of bindings, ropes, gags and a weapon are highlighted as behaviours demonstrating this theme. This view is shared by Salfati and Taylor (2006) whom also highlight behaviours designed to control the victim as an important discriminatory factor in their domain. In this respect, the weapon can relate to the enhanced control of the victim enabling the offence to be completed with greater ease. Salfati and Taylor further theorise that weapon use reflects a predominantly functional or instrumental behavioural aspect of the offence demonstrating the offender's need for control and characteristic of a planned offence. A so called organised offender would also be ascribed more likely to use a weapon to control and facilitate the crime (Ressler, Burgess, & Douglas, 1988).

Power and Intimacy

The next theme is also predominantly instrumental in nature as a weapon is shown by the offender in order to gain power over the victim in an attempt to offer the offender a level of victim compliance in which they can pursue pseudo-intimacy with the victim. Hazelwood and Burgess's (1987) FBI typology, based on the work of Groth (1979), suggests *power-reassureance* offenders commit offences in an attempt to challenge their own sexual doubts and their own personal inadequacy. As such the offender may ask the victim to participate in the offence, though importantly, without any motivation to either degrade or harm the victim. According to Keppel and Walter (1999) serial offenders motivated by power-reassurance may begin their offences with no weapon but progress to bringing a weapon to better gain full compliance from the victim, without the need to excessively physically harm them. For these offenders, the hostile or aggressive use of a weapon and associated higher levels of physical violence could be seen as counter-productive to their overall aim of achieving pseudo-intimacy through power.

Anger and Weapon Use

Groth (1979) argues that anger plays an important psychological role in rape and is also a central aspect to each aforementioned typology. To relate the different psychological processes of anger to weapon use, anger is separated into general and targeted anger.

In terms of general anger, Salfati and Taylor (2006) describe a *violent* theme associated with a hostile frenzied attack in both rapists and sexual murderers. The key variables composing the violent theme were multiple wounding, non-controlled violence and the offender using a weapon from the crime scene. Interestingly, they reported that rapists were more likely to bring a weapon to the crime scene (43% vs. 14%), whereby sexual murders were more likely to use a weapon from the crime scene (35% vs. 5%). The lack of a weapon in the sexual murderer sample may indicate the impulsivity and highly emotional offence of sexual murder.

Knight, Warren Reboussin and Soley (1988) describe a *pervasive anger* domain within the MTC: R3 in which offenders have enduring "global" anger "against the world", alongside a history of antisocial aggressive behaviours. As such, offenders express their anger though their rapes and victims are likely to receive a high level of injury. The *power assertive* domain involves an element of planning and physical aggression and is viewed as an expression of virility, masculinity and dominance on the part of the offender. Keppel and Walter (1999) state that regarding sexual murder this type of offender will often use a weapon and view it as an extension of their personality, carrying an element of symbolic importance to deliberately hurt and intimidate the victim.

Whereas the previous section considered general, or global, anger towards victims, there are offenders that have specific/targeted anger towards their victim; either as a specific person (e.g. girlfriend, prostitutes, etc.) or a particular misogynistic hatred of females for example. Canter, Bennel, Alison and Reddy (2003) found that factors such as tearing clothing, single and multiple acts of violence, demeaning behaviours, anal sex and verbal insults were commonly associated with each other composing a thematic region dubbed *hostility*. Likewise, Salfati and Taylor (2006) proposed a theme associated with violent behaviours such as anal penetration and the use of foreign objects in penetration, termed *exploit*. However, no definition of foreign object was provided, but there could be some crossover between the use of foreign objects and weapons as it is possible that some weapons could be used in this sexual manner. Previous literature indicates the correlation between head/face wounding, multiple wounding and a relationship to the victim (Salfati & Canter, 1999; Haugen, Slungard, & Schei, 2005).

Of relevance here is the term "overkill" that Douglas, Burgess, Burgess and Ressler (2006) describe as excessive violence that is personal against the victim, with anger as the common underlying drive. The example being a husband that severely bludgeons and stabs his wife 20 times, in comparison to a burglar whom they posit would not use such violence. They argue that overkill, especially to the face is often an attempt to dehumanise the victim-but may also indicate the killer knows the victim or represents a specific person.

Groth (1979) defined the *anger-retaliatory* domain, which included an expression of anger towards females, including a disregard for the victim, selfish behaviours and strong violence delivered through a perceived explosive retribution. In terms of sexual murder this type is more likely to assault with fists or weapons of opportunity, indicating an emotional and impulsive element to the crime. The MTC: R3 incorporates a *vindictiveness* domain that involves high levels of misogynistic anger directed and focused on women. The primary aim for such offenders is to degrade, harm and to humiliate women. In such cases of targeted anger, it could be inferred that weapon use would be used deliberately to harm and terrorise the victim. However, the choice of weapon could be relatively impulsive with offenders using any available object found at the crime scene.

Opportunism

Both the MTC: R3 (Knight, Warren, Reboussin, & Soley, 1988) and FBI (Hazelwood & Burgess, 1987) typologies involve an element of *opportunism*. Such crimes are influenced by contextual and environmental factors as opposed to deep-seated motivations. These seem to be criminally minded individuals, of which sexual crimes are but one element of an overall criminality and anti-social nature. It is unclear whether these individuals are more probable to generally carry weapons and then utilise them during an opportunistic offence or offend when opportunities arise utilising any weapon they can fashion at the crime scene.

Deviant Use

The final theme to be discussed from the typologies relates to the extreme of both instrumental and expressive factors. Groth (1979) discusses the *anger-excitation* motivation stating that it relates to a strongly pre-planned offence whereby the offender inflicts pain and terror on the victims in order to derive pleasure. The *sexual* theme within the MTC: R3 classification similarly assumes that some form of sexual preoccupation with sadistic fantasies serves to motivate the rape. Within the MTC: R3 highly sexual offences are sub-divided into sadistic and non-sadistic. In both the FBI and MTC: R3 typologies the sadistic elements would be likely to increase the use of weapons both to fully control the victim to enable the playing out of the fantasy and for the sadistic violence directed at the victim. As such, weapons go far beyond a functional use and are more likely utilised to enable the expression of deep psychological motivetions for power, control and sadism.

Discussion

The paper has sought to identify literature to inform thinking about the issue of weapon use both in sexual and violent crimes within a police context. It is clear that weapon use, while not the focus of a considerable amount of research itself, is discussed within a variety of offender and offence types. This paper has sought to bring this research together, identify a gap and to progress the topic forward. In consideration of the results from the literature and how weapon use has been viewed by a number of typologies the following dimensions of weapon use are proposed. These illustrate the range of offenders and motivations where weapon use may aid in discriminating offenders.

Evidence of Planning (Opportunism and Control)

Evidence of planning, be this high or low, emerged as a theme underpinning weapon use. This was found in a variety of the samples. High planning demonstrating forethought in bringing a weapon and a facilitative or controlling element to the crime compared to crimes of opportunity. Such a theme is consistent within an organised/disorganised offender and instrumental violence (Bartol, 1991).

Emotional Use of a Weapon (Anger and Power)

Weapon choice and use can also demonstrate an offenders' emotional expressiveness, feelings of inadequacy and anger towards the victim. In some research the weapon moves beyond a utility function to facilitate a crime and appeared to be related to an intent to harm the victim. This is consistent with expressive violence (Salfati, 2000). A practical example would be an offender brandishing a hammer or axe as compared to a knife in order to elicit terror and increase the damage potential. The choice of weapon in these instances may indicate differential motivations and thus generate discriminatory offender characteristics able to aid in offender profiling.

Conclusion

The above dimensions have implications for differentiating between offender characteristics, for example; levels of impulsivity, evidence of planning, anger and aggression, basic demographics and previous convictions. For example, offenders using a weapon as a strategy for control or to facilitate the crime would be, it is hypothesised, have a longer and more extensive criminal career than the other weapon dimensions. Those within the emotional use would be likely to have a violent criminal history.

While many aspects of a criminal career will be in constant development and subject to learning and other environmental factors, it is proposed that the underlying motivations of using a weapon are likely to remain static. Research on this topic would be valuable. Other unexplored concerns regarding weapon use would be issues such as the transition from youth to adult weapon use, different choices of weapon, escalation and de-escalation and consistency in weapon use. These are all key areas, not only academically but also of practical use to police investigations.

The current paper has examined the use of weapons within a number of crime types, but with a specific focus on sexual crimes. This research has been discussed and considered within an offender-profiling context. Key results have been presented from the literature review and proposed motivations underpinning the use of a weapon. The topic of weapon use has not been explored adequately in the previous literature-while the present study is far from comprehensive, it can hopefully lay some important groundwork to extend research on the issue of weapon use.

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CHAPTER 2

PRELIMINARY INSIGHTS AND ANALYSIS INTO WEAPON-ENABLED SEXUAL OFFENDERS

Chapter rationale

Chapter 1 outlined the weapon literature both within general and sexual offending before drawing upon the offender profiling research to explore motivations around weapon use. Indeed, the review was the first of its type to exclusively examine the role of weapons within a forensic focus. Within the review, the identification of themes focussed upon 'evidence of planning' (e.g., control, opportunistic motivations) and 'emotional use' (e.g., power or anger motivations) and attempted to orient the motivations around weapon-enabled sexual offending and generate a testable model that could act as one of the primary threads throughout the thesis.

Continuing this analytical thread, Chapter 2 can be seen as the first empirical step in exploring weapon-enabled sexual offending in England and Wales. While at face value, a number of the aims could be perceived as relatively basic, such as exploring the prevalence of weapons and exploring the potential differences between weapon-enabled and non weapon-enabled sexual offenders, these issues have not previously been explored in sufficient depth. Nor have they been explored within the focus of offender profiling, which is relevant because it seeks to derive insights from specific crime scene behaviours. The chapter furthermore explores the homology assumption of offender profiling, which would suppose that weapon enabled sexual offenders ought to be demographically different than those without a weapon. If this premise holds, it would be of practical value for investigations in terms of suspect

prioritisation and resource allocation. As such, the focus on weapons herein is an original and creative exploration of the homology assumption and the attempt to derive applied learning.

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Preliminary insights and analysis into weapon enabled sexual offenders

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Abstract

Purpose – *Weapon use is recognised as a key crime concern in England and Wales but has received relatively little focused research. The purpose of this paper is to examine weapon use by sexual offenders to develop new insights relevant for a police audience. Specifically, to examine the prevalence of weapons within sexual offenders and explore the differences between weapon and non-weapon enabled offenders on a range of characteristics.*

Design/methodology/approach – *A sample of 1,618 single, stranger, solved, serious sexual assaults were provided by the Serious Crime Analysis Section of the Serious Organised Crime Agency. In all, 20 per cent of offenders were weapon enabled.*

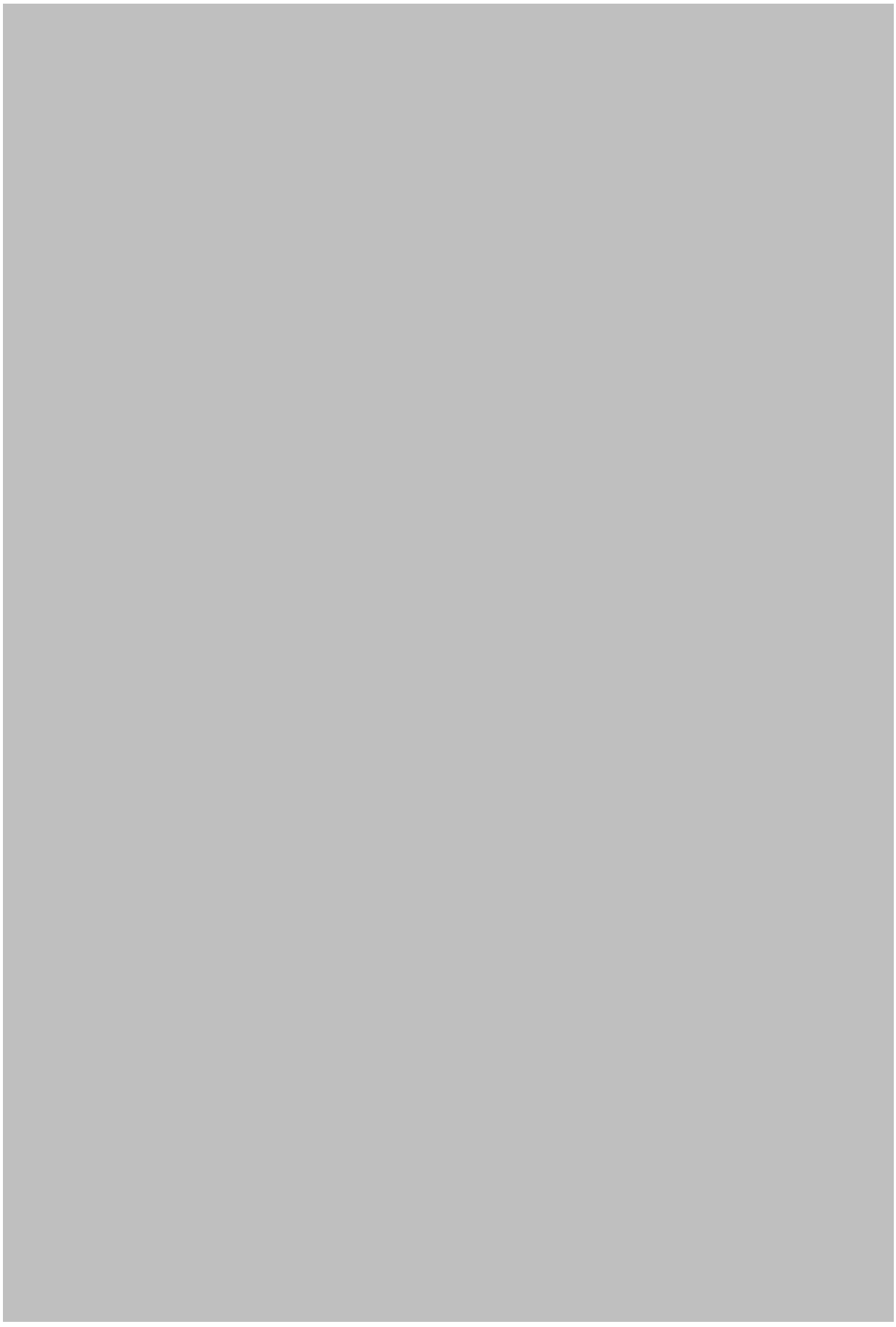
Findings – *There were almost no demographic differences between weapon enabled and non-weapon enabled offenders. In terms of the offence itself, there were many significant differences between the groups in terms of precautions used, victim involvement, injury, attack behaviours, victim approach and attack location. Further multivariate analysis revealed aspects of the offence that were associated with weapon use; these are broadly discussed within themes of violence and evidence of planning.*

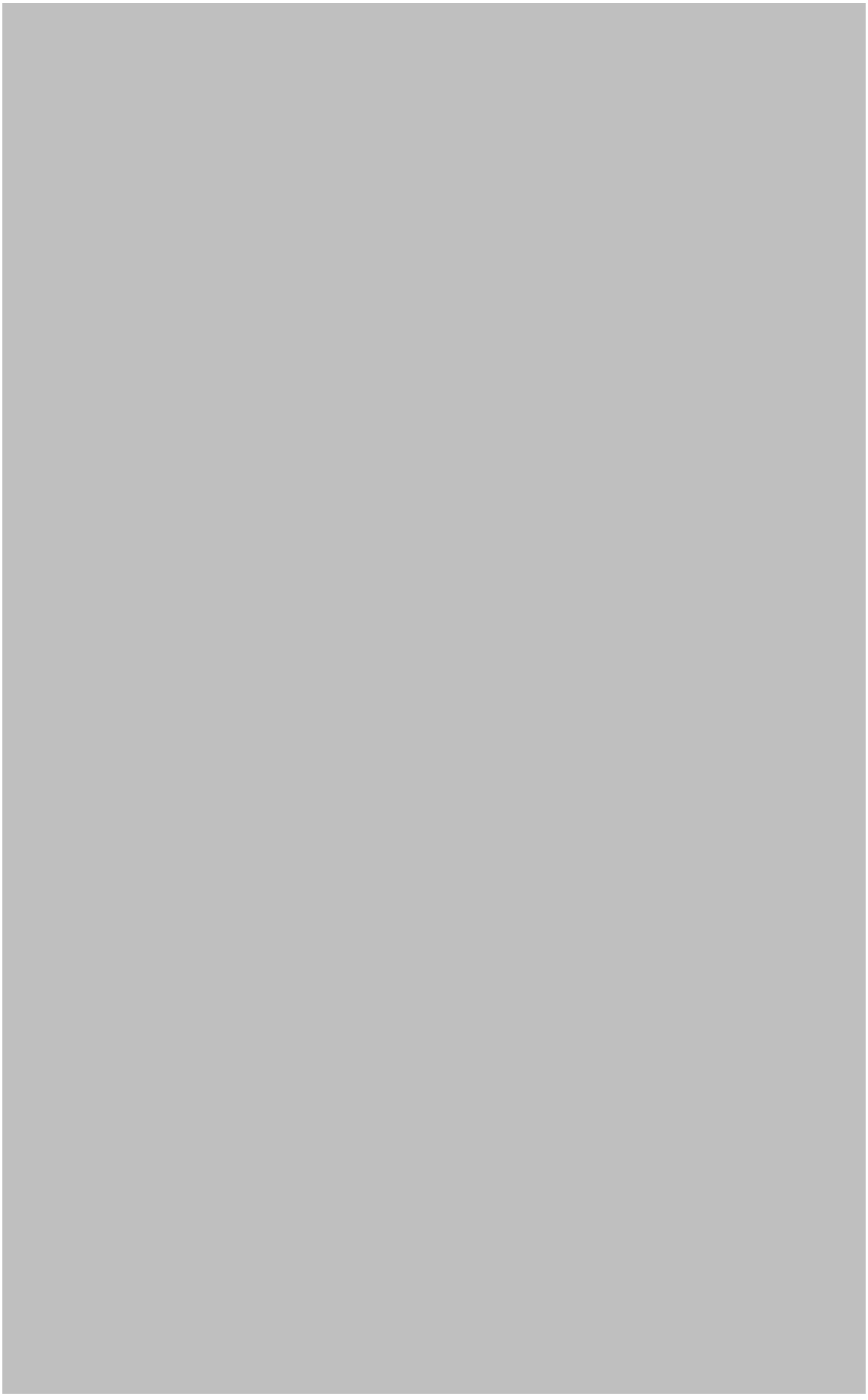
Originality/value – *The authors argue that an examination of weapon use is valuable in illustrating how offenders differ in their offence and provide insights for the investigation of such crime.*

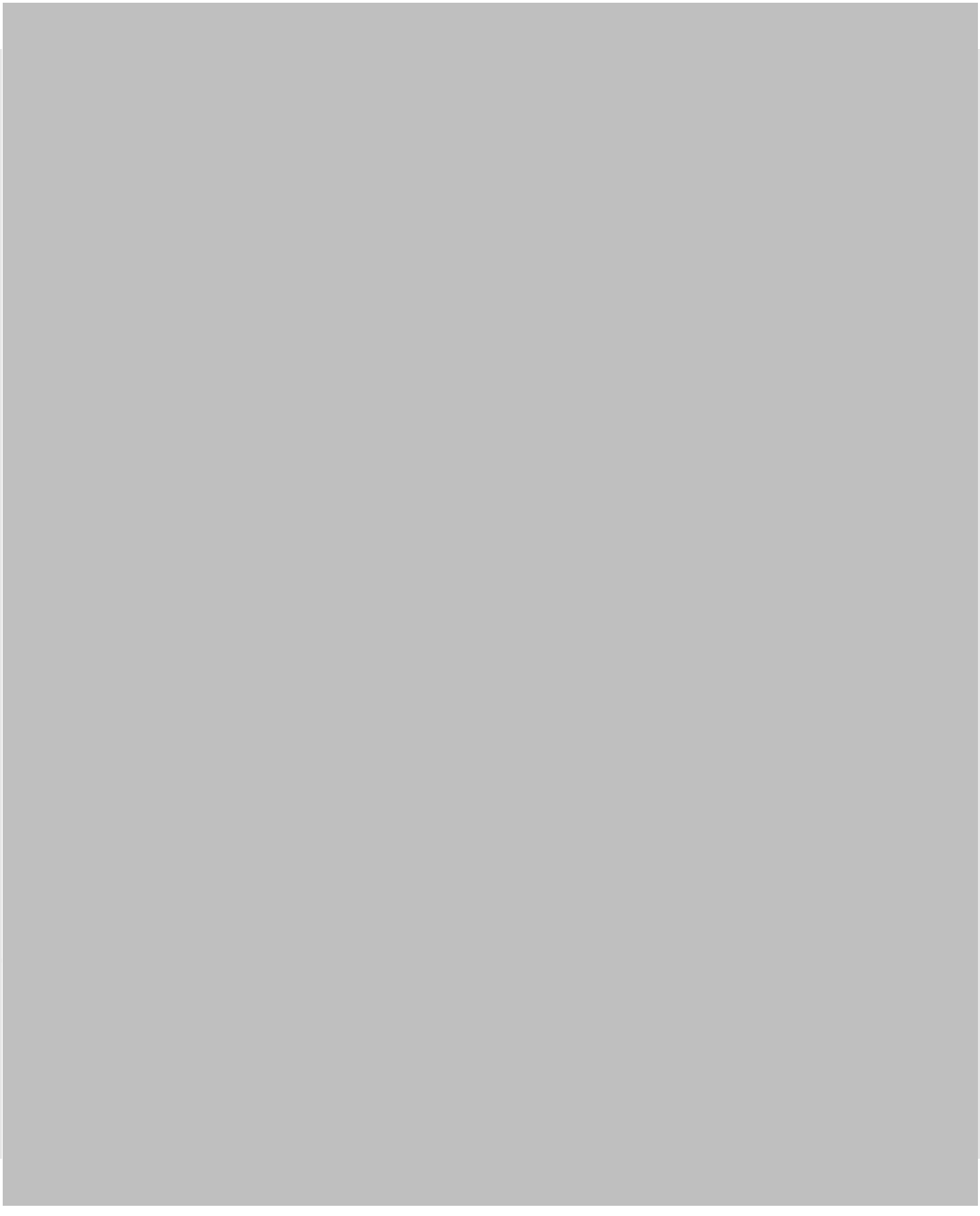
Keywords *Violence, Police, Weapons, Offender profiling, Sexual offences, Sexual offenders*

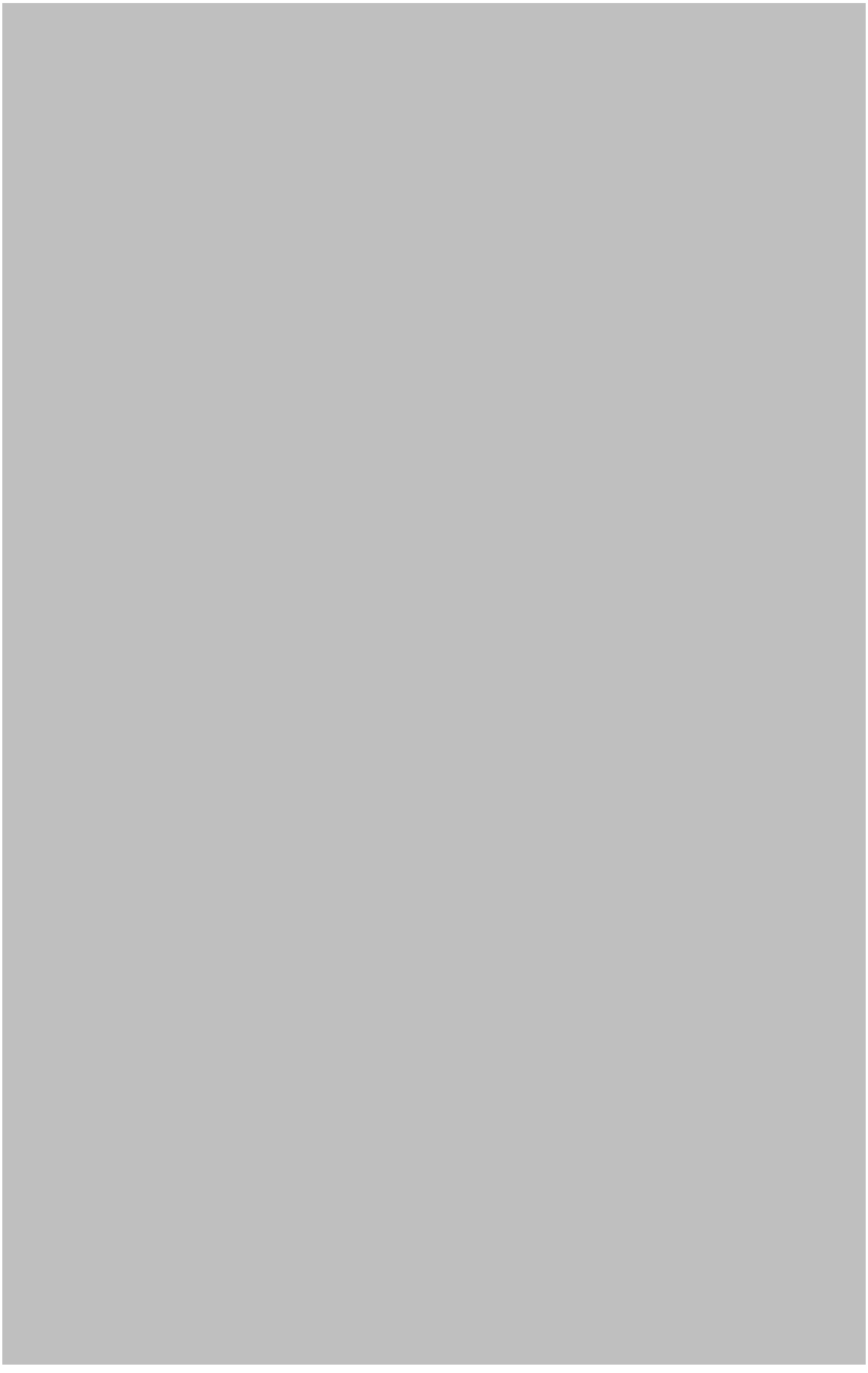
Paper type *Research paper*

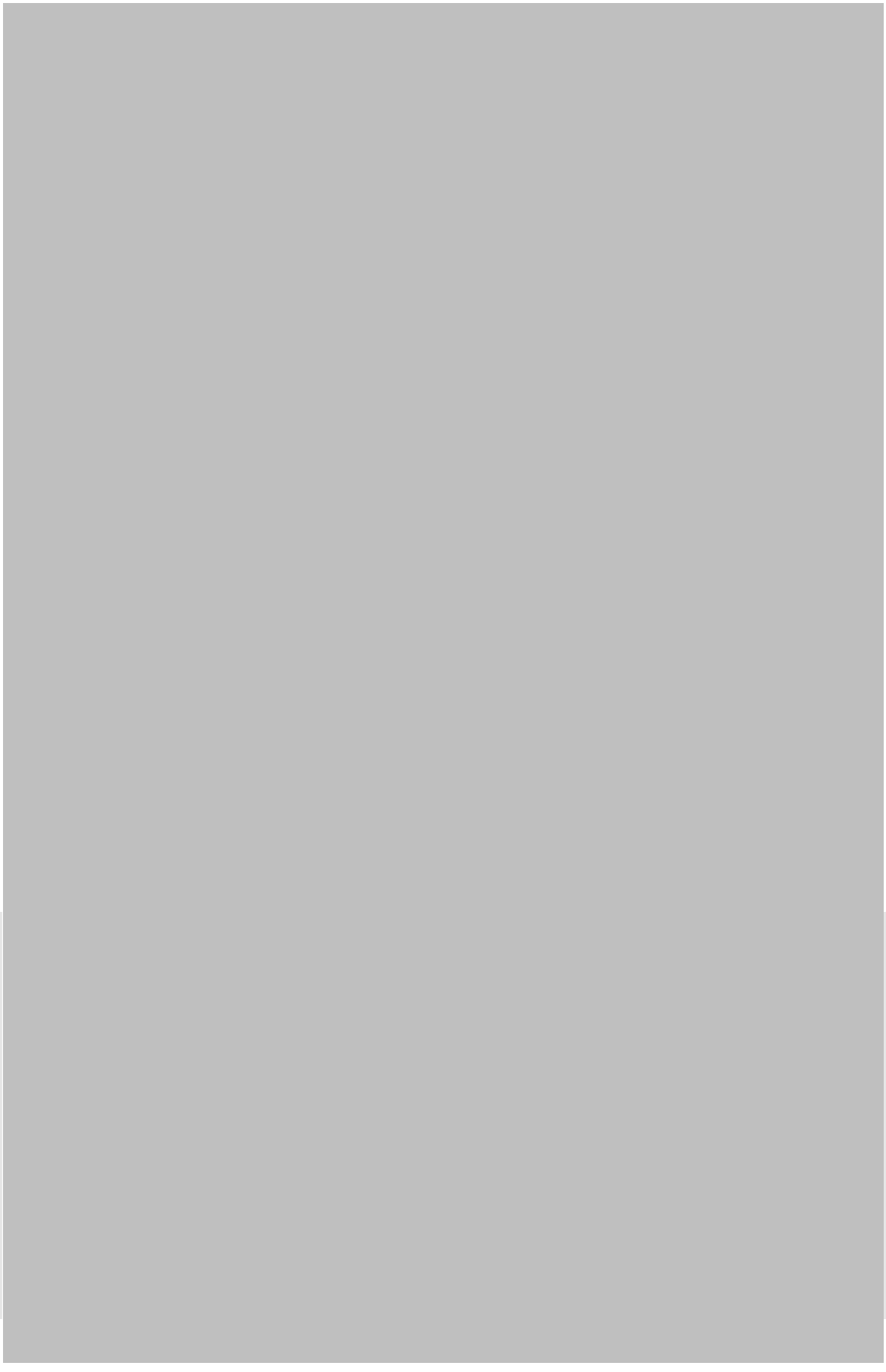
The authors would like to thank Dr Jess Woodhams for their valuable contribution to the current paper.

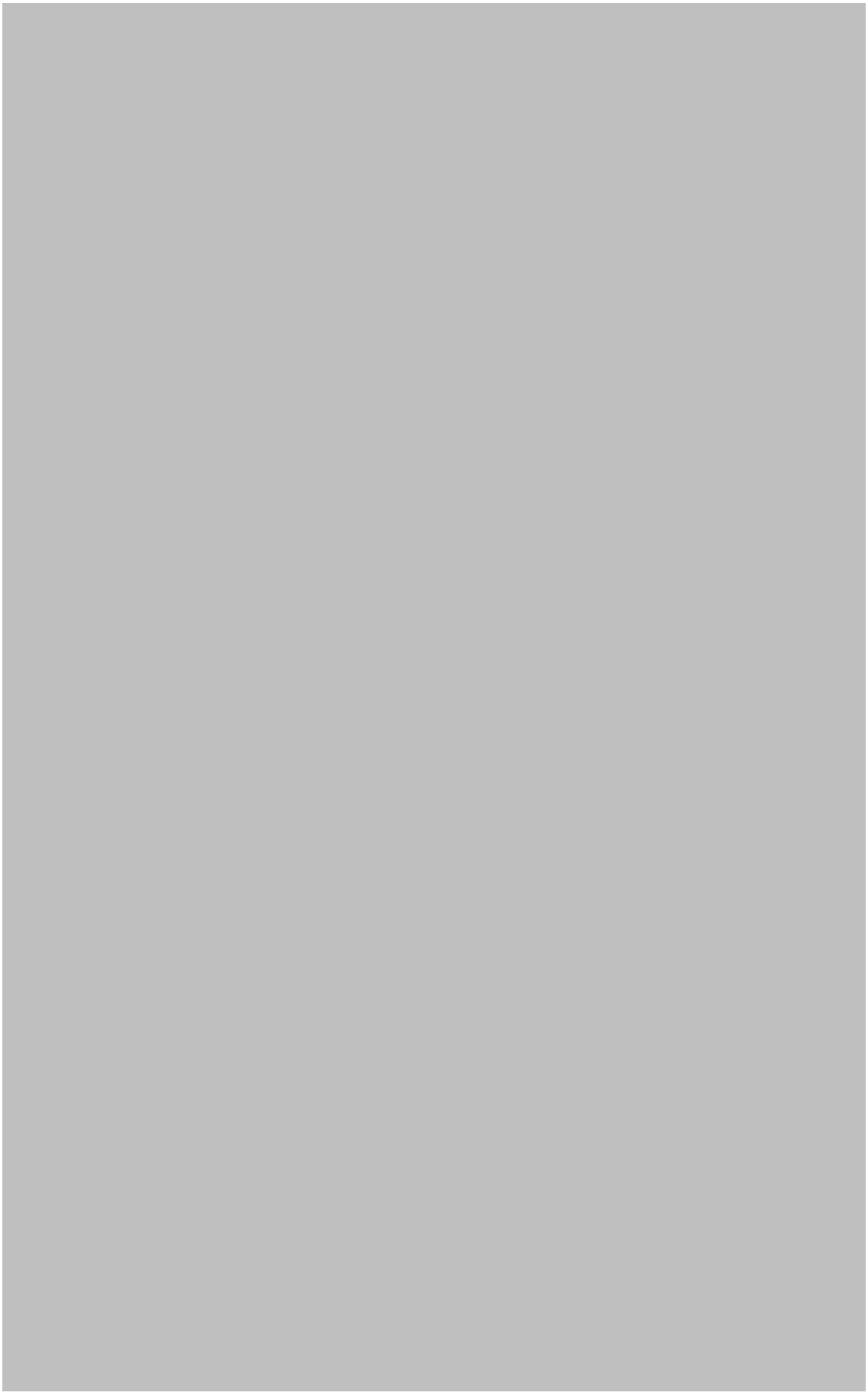


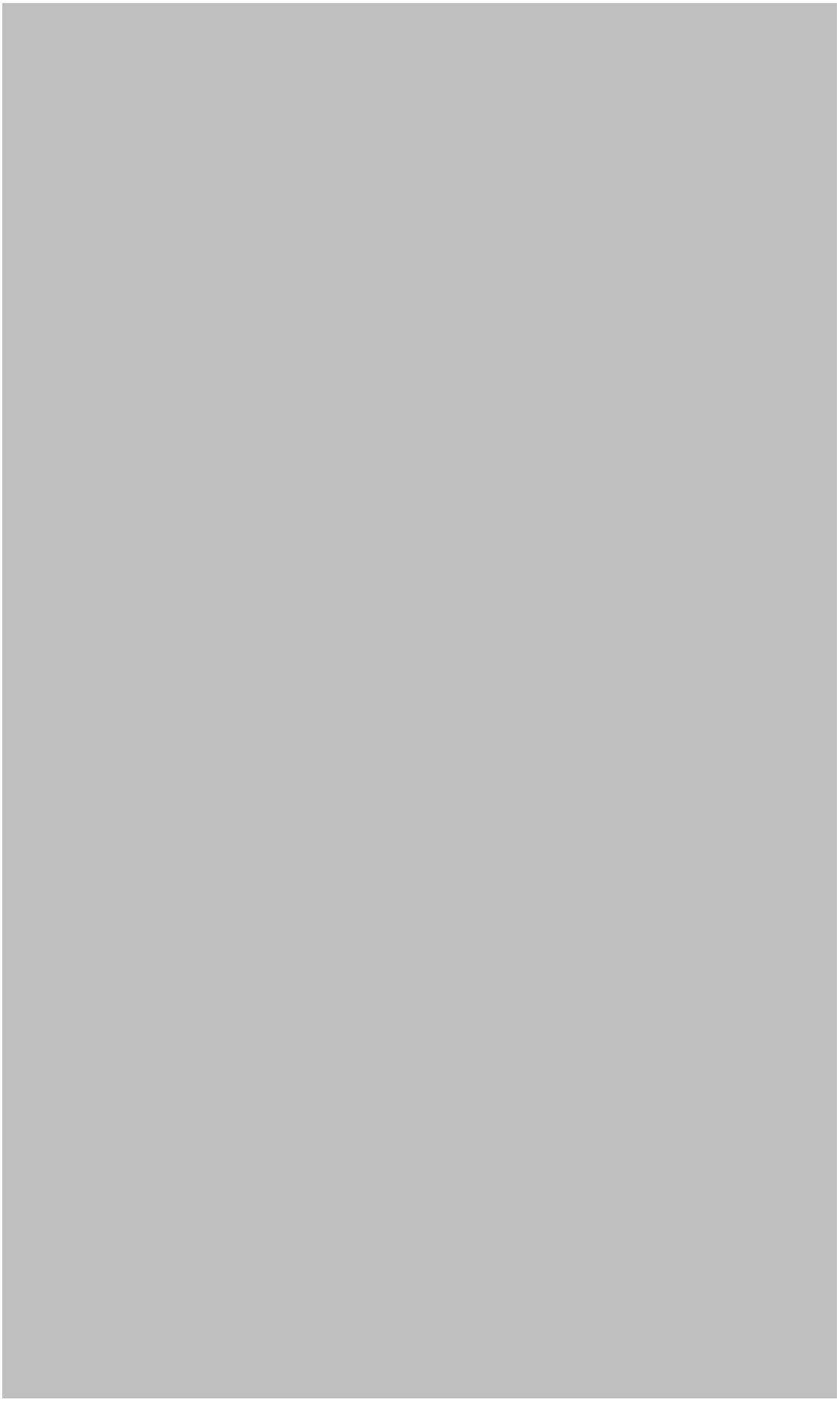


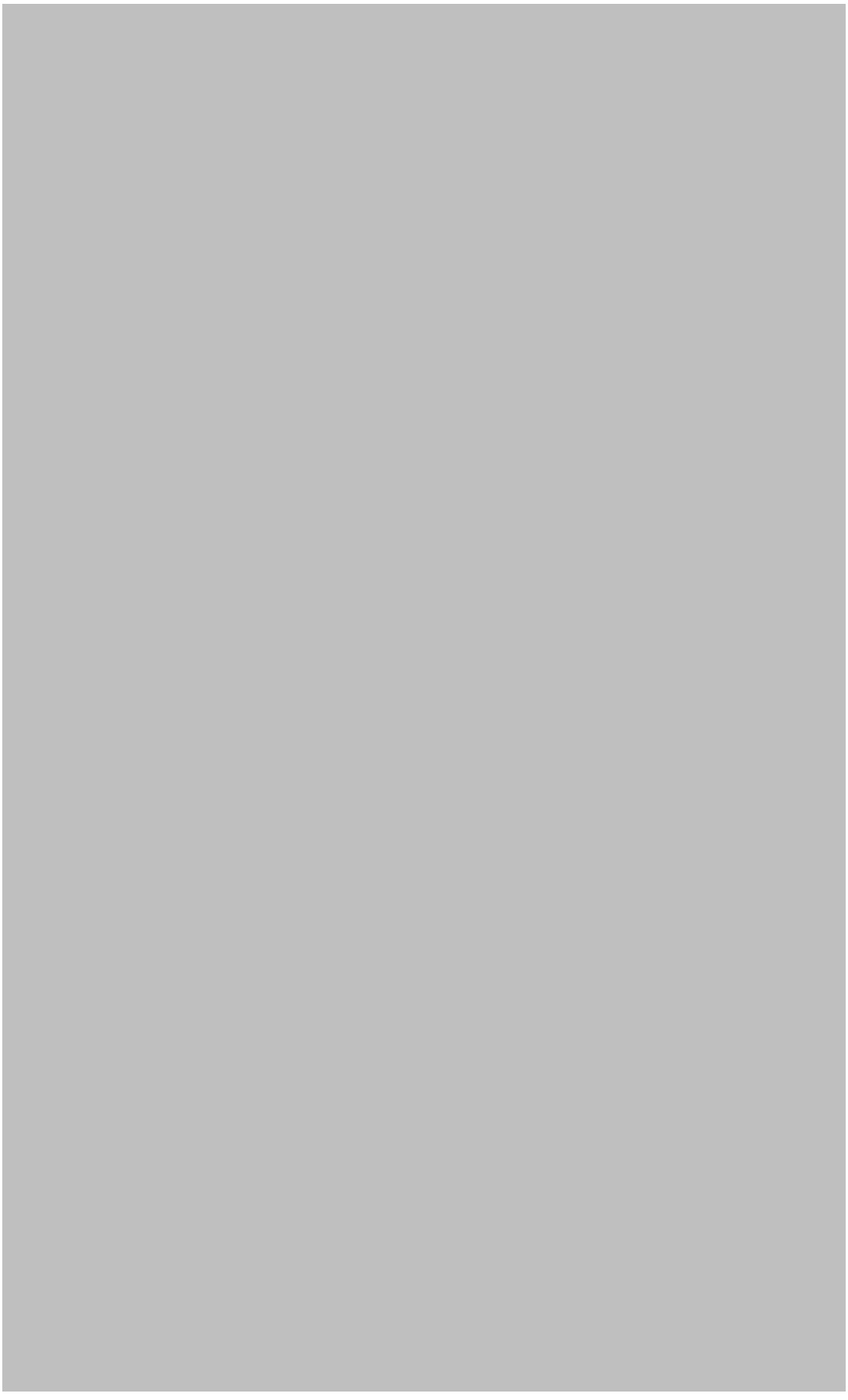


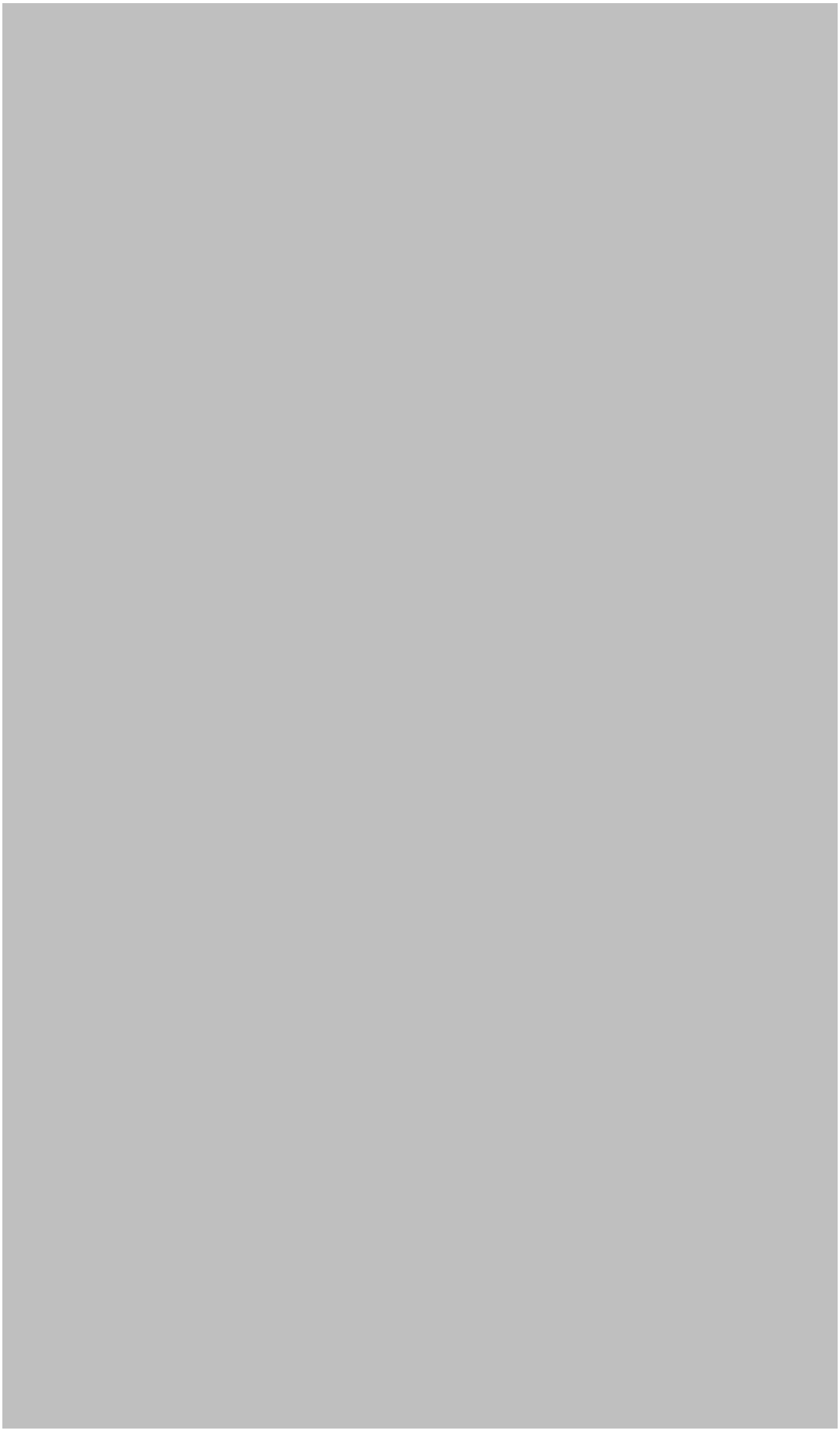


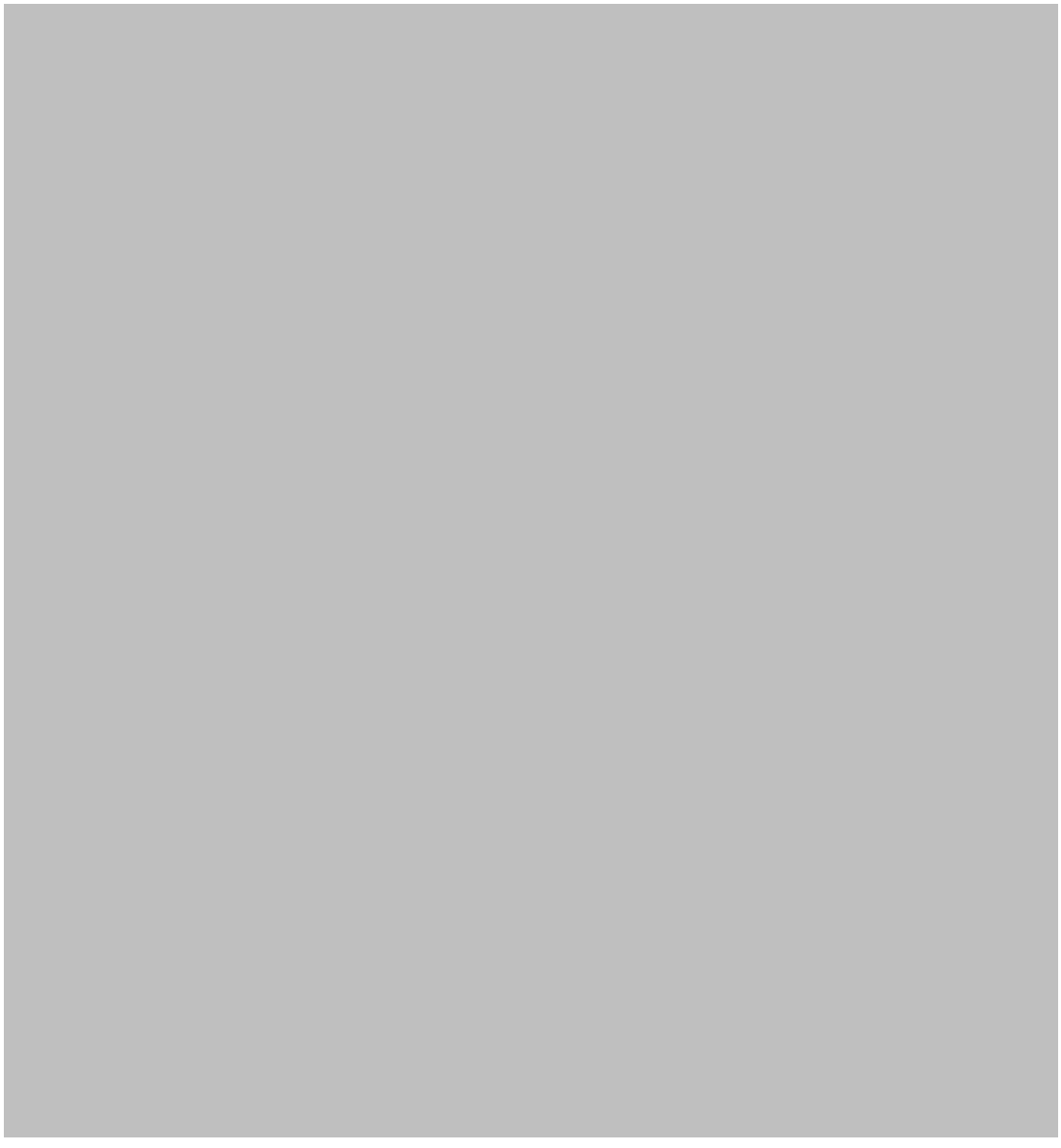












CHAPTER 3

WHETHER THE WEAPON IS BROUGHT OR FOUND AT THE CRIME SCENE - IMPLICATIONS FOR OFFENDER PROFILING AND THE HOMOLOGY ASSUMPTION

Chapter rationale

Results from Chapter 2 did not support the homology assumption given the lack of differences in demographic characteristics between weapon versus non weapon-enabled sexual offenders. However, there were many behavioural differences, indicating value in exploring the topic further. Previous research to involve weapons has not explored the different nuances behind weapon-enabled offending: to illustrate, the excellent research by Canter *et al.,* (2003), one of the more well regarded typological studies, only included one variable, that of 'weapon used to control'. This highlights an existing gap in the literature in terms of weapons. Chapter 3 continues the study of weapons within sexual offenders with a specific focus upon one of the nuances behind weapons; specifically, weapon obtainment and again the concept of homology. In this respect, the chapter draws inspiration from the organised/disorganised model of violence (outlined in the Introduction to the thesis) that predicts differences between offenders based upon weapon obtainment. This direction is also consistent with recent studies exploring which specific crime scene behaviours or potentially wider themes, such as evidence of planning (Goodwill & Alison, 2007), may be of greater value for drawing inference and empirical learning around the offender.

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Abstract

The homology assumption predicts an association between offender characteristics and crime scene behaviour. If valid, such relationships could benefit a police service through a 'offender profiling' theme. To date, the homology assumption has received little scientific support. The current paper focussed upon weapon-enabled sexual offenders and drawing on the organised/disorganised theory of crime, examined the homology assumption in terms of demographic differences between offenders who either found a weapon (*n*=57) or brought one to the scene (*n*=165). There were numerous differences comparing crime scene behaviour of these groups, many of which consistent with the organised/disorganised model. There were no significant differences in terms of offender age, employment, offender ethnicity and relationship status. A multivariate model to predict weapon obtainment was generated and achieved good predictive ability. The implications of the lack of demographic differences are discussed in terms of both the organised/disorganised theory and the homology assumption.

Introduction

Offender profiling is an umbrella term for a variety of different practices (see Alison, Goodwill, Almond, Heuvel, & Winter, 2010, for a description of the three main approaches to offender profiling: Clinical, Investigative and Statistical, and largely due to the glamourisation of media and film has garnered somewhat of a mythical reputation (Herndon, 2007). Recent reviews of the literature on offender profiling have concluded that there is little robust evidence of profiling proving of practical value to the police (Dowden, Bennell & Bloomfield, 2007; Snook, Eastwood, Gendreau, Goggin, & Cullen, 2007). In parallel, there has been a drive in the field of offender profiling to ensure it is a more evidence-based practice (see Alison & Rainbow, 2011). The current paper is an attempt to contribute to the limited empirical study of the principles of offender profiling by investigating one of its core principles.

The Homology Assumption

Profiling rests on two core assumptions (Alison *et al.,* 2002). The consistency assumption would predict that offenders will show a degree of consistency in their crime scene behaviour over a series. The homology assumption would suppose that the manner in which a crime is committed is related to the characteristics of the offender responsible. It follows that the more similar the crime scene of two offenders, the more similar their characteristics should be. Equally, if the behaviour displayed in two crimes differs in key areas, one would expect the traits of the two offenders responsible to be different. Without these assumptions holding it would be difficult to make accurate predictions about an offender's characteristics based upon a given crime scene.

Despite being a core assumption of offender profiling, the homology assumption has been the subject of limited empirical research. Of the four studies conducted, three have found no/little evidence in support of the assumption (Doan & Snook, 2008; Mokros & Alison, 2002; Woodhams & Toye, 2007). The crimes under inspection in these studies were stranger rape, commercial robbery and arson. However, Tonkin, Bond and Woodhams (2009) examined a sample of burglars and reported a positive and significant relationship between similarity in deprivation and similarity in footwear cost. Indeed, unemployed offenders wore significantly more expensive footwear to the crime scene than employed offenders. Reflecting on the general failure to empirically demonstrate evidence of homology, Mokros and Alison (2002) highlight the importance of wider situational influences on behaviour, using the example of offender violence during an offence potentially being influenced by wider issues such as personality disorder or offender alcohol use.

In what can be argued as an important step forwards for profiling and the homology assumption, Goodwill and Alison (2007) reported that offender age predicted victim age - but only when the offender displayed *evidence of planning* and *gratuitous violence*. This continued to demonstrate the importance of exploring the broader themes within the analysis of offending behaviour (e.g., situational, behavioural and contextual factors). There has been other research that has explored these more nuanced aspects of offending such as the influence of alcohol, pornography or personality disorder on crime scene behaviour (Barbaree & Marshall, 1991; Cervone & Shoda, 1999; Ouimet, Guay & Proulx, 2000; Taylor, Bennell, & Snook, 2002). Indeed, Beauregard, Lussier and Proulx (2010) demonstrated that sexual interests,

alcohol use and an offender's emotional state were all related to how the crime was committed.

In this way, profiling now has a greater focus on these broader themes, and moving forward, the key question is whether such psychological characteristics, thought processes and so on can be linked to different socio-demographic characteristics of an offender (Goodwill & Alison, 2007; Woodhams, 2012). However, this brings with it tensions - especially regards how the underlying assumptions of profiling (consistency and homology) or the 'A to C equation' (whereby 'A' are the specific crime scene behaviours and 'C' are the characteristics of the offender) (Canter & Young, 2003) have been interpreted. Essentially, this challenges the assumption of gleaning *direct* relationships between behaviour(s) and characteristics, especially within the context of individual offender differences and subjective experiences.

Such discussions continue to raise questions about the viability of profiling, especially within the concept of 'homology'; as Goodwill and Alison (2007) conclude, "the real challenge [for profiling] is to identify what kinds of behaviour should be used to profile what kinds of characteristics". (p. 838). There is a new research direction for profiling, but it is still unclear which wider themes are most suitable for profiling and more research is required to narrow that focus.

Can the organised / disorganised dichotomy suggest a way forward?

In 1974 the Federal Bureau of Investigation (FBI) set up their Behavioural Science Unit to utilise the known information about a crime to make inferences about an unknown offender (Ressler, Burgess, Douglas, Hartman & D'Agostino, 1986). The

unit was initially set up to investigate serial rape and homicide cases and the published material from the unit was based upon a mixture of interviews with offenders and expert knowledge. Possibly the most well known product from the unit was the organised/disorganised dichotomy of crime. This dichotomy was initially developed as a means of understanding violent serial killers, although the scope has expanded to encompass other crimes such as rape and arson (Douglas, Burgess, Burgess & Ressler, 1992; Kocsis, Irwin & Hayes, 1998) and it has become one of the most widely known classifications of criminal behaviour.

The core concept underpinning the dichotomy is that offenders can be differentiated through two primary themes and that the crime scene is considered to reflect the personality of the offender. An organised offender is posited to demonstrate a high level of planning and a methodical approach to their crime. Such organised behaviours (e.g., planning the offence, targeting victims, moving or hiding a body, leaving less evidence at the scene, bringing restraints, bringing a weapon) would be taken to infer an offender of above average intellect, older, one that is socially competent, that had a controlled mood during the crime and is likely to be in skilled employment. The disorganised offender is the opposite, lacking any planning or forethought, whose crime will portray a spontaneous or chaotic lifestyle (Ressler *et al.*, 1986). Such an offender would also be expected to be socially immature, younger, living alone, of below average intelligence, less likely to be in skilled employment and present in an anxious mood during the offence. Whilst this dichotomy would appear to have been embraced and glamorised by the media, it has not received such a welcome from academia, where it has been described as lacking in scientific rigour and as an

oversimplification of criminal behaviour (see Canter, Alison, Alison & Wentink, 2004; Snook, Bennell, Taylor & Gendreau, 2008).

However, there is evidence for the value of the dichotomy within offending. Beauregard and Field (2008) reported some support when exploring body disposal patterns; that is, the presentation of organised psychological characteristics was a strong predictor of body disposal even when controlling for situational factors. Likewise, Kocsis, Irwin and Hayes (1998) provided evidence of the dichotomy with their sample of arson offenders. They reported two distinct clusters of arson: organised (e.g., accelerants usually taken to the crime, attempts to maximise damage, no or little evidence left at the scene) and unorganised (e.g., accelerants not taken to the crime, haphazard fire damage, forced entry, evidence left at the scene).

As discussed earlier, there is no clear consensus on the type of broader themes of behaviour that may be most suitable within the offender profiling context. The present chapter draws influence from the organised/disorganised dichotomy, as one of the longstanding (if controversial) aspects within the profiling literature through which to test the homology assumption.

Weapon use as a proxy for levels of organisation or disorganisation

Previously, the authors have explored weapon enabled sexual offending and argued that the subtleties of using a weapon have not been represented within the profiling literature to date. They have also demonstrated weapon-enabled offenders to be, in some respects, different than non weapon-enabled offenders in how the offence was conducted. For example, weapon-enabled offenders were more likely to be

employed and more likely identified as a frequent criminal than a non weapon-enabled group (Dawson, Goodwill & Dixon, 2014). Such differences are consistent with what the organised/disorganised model would suppose - that there is a positive relationship between criminal history and employment and the use of a weapon. Moving into the subtleties of weapon use, according to the organised/disorganised model, those offenders who *bring* a weapon to the crime scene should be organised and those who *find* a weapon at the scene disorganized (Douglas, *et al.,* 1992) and therefore they should be demographically different.

The authors argue that whether the weapon was found or brought should not be viewed as just another individual crime scene behaviour - but one that has the potential to represent broader underlying themes of offending (in this instance, levels of planning through organisation and disorganisation). An analysis of weapon related behaviour within this context provides a novel exploration of the homology assumption: there ought to be demographic (and other) differences between those that bring rather than find a weapon at the crime scene. Specifically the aims of the current paper were:

1. To outline the basic frequency of how the weapon was obtained within the offences of weapon-enabled sexual offenders.

2. To test for the homology assumption in relation to levels of planning (through whether the weapon was found or brought) within:

- Offender and victim demographics;
- Crime scene behaviours;
- Identify those behaviours that best predict how the weapon was obtained.

Method

Sample

The sample was provided by the Serious Crime Analysis Section (SCAS) of the National Crime Agency, United Kingdom. The sample consisted of all solved lone stranger serious sexual assaults held by the SCAS that had occurred between 1973 and 2008[4] (a total of 1618 assaults) of which a total of 316 were weapon-enabled, that is to say a weapon was reported to have played a role during the offence. The data was captured on the Violence Crime Linkage Analysis System (ViCLAS[5]). All weapon-enabled offenders were male. Ages were available for the majority of offenders (*n*=310, 98%): the mean age was 27 years, albeit with a wide range (14 to 63, *SD*=9.4). One-quarter (*n*=73, 23%) of offenders were described as presenting with a frequent criminal lifestyle. Nearly half (*n*=145, 46%) of the offenders were employed in some way; fewer were students (*n*=94, 29%) or unemployed (*n*=59, 19%). The majority of offenders were of White European ethnicity (*n*=231, 73%).

Procedure

The data for the study were provided to the authors in an anonymised state in the form of an Microsoft Excel spreadsheet containing variables that described: the basic demographics of the victim and offender (where known); weapon use; how the offender approached the victim; offence behaviours; levels of victim injury; precautions used by the offender; and any verbal dialogue by the offender during the offence. No assessment of the inter-rater reliability of the coding was possible because the variables had been coded previously by SCAS employees, however, various steps to ensure data

[4] The data request originated from 2008.
[5] For more information of the ViCLAS data and variables - see the Royal Canadian Mounted Police http://www.rcmp-grc.gc.ca/tops-opst/bs-sc/viclas-salvac-eng.htm.

quality are employed by the SCAS which have been described elsewhere (Dawson, Goodwill & Dixon, 2014)

All variables regarding offending behaviour were coded in a binary fashion (i.e., the behaviour was present or not). Variables with frequencies greater than 95% or less than 5% were removed in accordance with previous research (Canter, 1994; Santtila, Junkkila & Sandnabba, 2005). The variables that were removed were: assault (99%); sexual assault (99%); severe wounding (3%), any verbal theme (98%); attacking in a unfamiliar location (2%); all body specific injury sites not including the head or face (i.e., genital 0.3%; breasts 0.9%; hands 0.3%); immediate violence (4%); offender separated (2%); offender divorced (4%); offender physical disability (2%); offender homeless (2%); a blitz approach (2%) and offender masturbates the victim (2%).

Where appropriate, less frequent, thematically similar, variables were collapsed into a higher level variable representing a common theme: a **'sexual dysfunction'** variable was created that merged 'retarded ejaculation', 'premature ejaculation' and 'inability to maintain erection'; a 'degrading sex variable' merged 'object insertion', 'anal sex', and 'ejaculating on the victim'; a **'verbal aggression'** variable merged 'offender insults victim' and 'offender uses abusive language'; a 'personal verbal' theme merged 'offender 'reassuring', 'victim enjoyment', 'relationship', 'complimenting' and 'apologising' to the victim'; a **'forensic precautions'** variable merged the offender using 'gloves', a 'condom', 'destroying forensics' or 'bathing/cleaning the victim' after the offence and a **'protect identity'** theme that merged (use of disguise, covering victim eyes, telling the victim not to look). In addition, a small number of new variables were created from the data to examine some more extreme behaviour such as the

offender presenting with 'more than one weapon', causing 'two or more head or facial injuries' to the victim and taking 'two or more precautions'.

These variables were subject to chi-square analyses, leave-one-out logistic regression and ROC analyses. When multiple chi-squared analyses are run, it is advisable to calculate a correction to adjust for possible statistical errors. The Benjamini–Hochberg (1995) method has been shown to be less conservative and have greater statistical power than the Bonferroni correction (Williams, Jones, & Tukey, 1999); therefore the Benjamini–Hochberg correction was used to correct for type 1 errors. Significant results post-correction are focused upon, although results that were not retained after the statistical correction are noted in the text.

Cross-validation is a widely used approach to evaluate modeling methodologies. The leave-one-outcross validation was used in the current paper (Herrmann, 1998). This process involves taking each case out of the dataset one at a time and then developing a logistic regression model on the remaining dataset which is then applied to the extracted case to produce a predicted probability. This process is repeated for every case in the original dataset. The predicted probabilities subsequently form the input data to enable ROC analysis (Woodhams & Labuschagne, 2012). ROC is a widely used and accepted non-parametric technique for visualising and analysing the behaviour of diagnostic systems (Swets, 1988) and has been demonstrated to add value even within police decision making accuracy and decision making utility (Bennell, 2005). The technique is not significantly affected by the shapes in the underlying population and the curve plots the true positives (sensitivity) versus false positives (specificity) and assesses decision making accuracy across a range of decision

thresholds. They are able to provide a richer measure of classification performance compared to other evaluation techniques (Fawcett, 2006). The Area Under the Curve (AUC) of a ROC serves as a quantitative summary of the strength of association - its value will always be between 0 and 1.0. A AUC of 0.50 indicates the diagnostic ability is no better than chance. Generally, AUC's between 0.7-0.8 are viewed as acceptable, 0.8-0.9 as excellent and above 0.9 as outstanding discrimination (Hosmer, Lemeshow & Sturdivant, 2000).

Results

1. Outline the basic frequency of how the weapon was obtained within the offences of weapon enabled sexual offenders.

Of the 316 weapon-enabled offences, the most frequently reported weapon was a knife (*n*=255, 81% of weapon users) with guns (*n*=24, 8%) or blunt objects (*n*=42, 13%) less frequent. A small number of offenders were attributed to have more than one weapon (*n*=22, 7%). Where known, offenders were more likely to bring the weapon themselves to the crime scene (*n*=165, 74%) as opposed to it being found at the crime scene (*n*=57, 26%), in 88 cases this information was not known. Analysis has a focus upon these cases where it was known how the weapon was obtained[6].

2. Test for the homology assumption in relation to levels of planning (through whether the weapon was found or brought) within[7]:

[6] Out of the total weapon enabled offenders - there were six cases where a weapon was both found and brought. Given the uncertainty, these six were excluded from further analysis.
[7] Refer to Dawson, Goodwill & Dixon (2014) [e.g., chapter 2] for baseline statistics of crime scene behaviours in the wider 'weapon' and 'non weapon-enabled' groups.

Offender and victim demographics

In terms of offender and victim demographics there were many similarities between the groups: those who find the weapon had a mean age of 28 compared to 27 for those that brought the weapon; almost three quarters of both were White ethnicity (found *n*=42, 74%, brought *n*=118, 72%) and a minority of both attacked a victim with a physical or mental disability (brought *n*=11, 7% vs. found *n*=4, 7%).

In terms of basic offender demographics there were no significant differences between the groups. This includes, employed status (found, *n*=24, 42%, vs. brought *n*=82, 50%, *p*=.202); student status (found, *n*=13, 23%, vs. brought *n*=53, 32%, *p*=.122); single relationship status (found *n*=25, 38%, brought *n*=62, 44%, *p*=.247); and a frequent criminal variable (found *n*=16, 28%, brought *n*=34, 21%, *p*=.164). The variable of mental disability (as captured by ViCLAS) was more likely in those offenders that found as opposed to brought the weapon (found *n*=6, 11%, vs. brought *n*=6, 4%, *p*=.056) although this was a minority of both groups and the difference approached but did not reach significance.

In terms of victim demographics, those who found the weapon had significantly older victims compared to those who brought the weapon (mean age 34 vs. 25, df=215, *t*=4.12, *p*=.001). Elsewhere, there were no other significant differences in terms of male victims (brought *n*=14, 9% vs. found *n*=9, 16%, *p*=.098); student victims (brought *n*=36, 22% vs. found *n*=15, 26%, *p*=.300) and whether the victim was a drug user (brought *n*=16, 10%, vs. found *n*=7, 12%, *p*=.371). Table 1 shows the significant group differences after Benjamini–Hochberg (1995) statistical correction[8].

[8] Statistics here were chi-square for associations and an independent samples t test for offender age.

Table 1: Significant differences between those offenders that brought the weapon as opposed to found it.

All comparisons X2 unless stated	**Found weapon** *n*=57,	%	**Brought weapon** *n*=165,	%	***Bivariate significance (p)***	**Phi effect size**
Mean victim age (*T Test statistic)	34		25		0.001	0.559 *Cohen's d
Outdoor offence	8	14%	104	63%	0.001	0.428
Indoor offence	30	53%	35	21%	0.001	0.302
Offender drug use	7	12%	1	1%	.0001	0.274
Familiar location	30	53%	39	24%	.0001	0.274
Knife	37	65%	142	86%	.0010	0.234
Duration of contact: < 1 hour	15	26%	84	51%	.0040	0.216
Blunt	15	26%	16	10%	.0030	0.209
Duration of contact: 4 + hour	19	33%	25	15%	.0040	0.199
Surprise approach	16	28%	82	50%	.0030	0.192
Offender alcohol use	13	23%	17	10%	.0180	0.161
Burglary motive	14	25%	19	12%	.0180	0.161
Offender younger than victim	31	54%	61	37%	.0160	0.154
Confidence approach	38	67%	82	50%	.0190	0.149
Use vehicle	5	9%	36	22%	.0190	0.147

Crime scene behaviours

Turning to the crime scene behaviours, there were no differences in terms of inflicting any injury (found *n*=27, 44% vs. brought *n*= 73, 47%, *p*=.440); use of any precaution (found *n*=36, 63%, % vs. brought *n*=106, 64% *p*=.502); vaginal penetration (found *n*=39, n=68% vs. brought *n*=126, 76%, *p*=.157); use of a forensic precaution (found *n*=9, 16%, vs. brought n=34, 21%, *p*=.279); stealing from the victim (found *n*=24, 42% vs. brought *n*=62, 38%, *p*=.326) and the use of restraints (found *n*=7, 12%, vs. *n*=11, 7%, *p*=.146).

However, there were a variety of significant differences between the groups, to illustrate, offenders who brought a weapon to the scene were significantly more likely to:

- Have a duration of contact between victim and offender of less than one hour (brought *n*=84, 51% vs. found *n*=15, 26%, *p*=.001);
- Attack outdoors (brought *n*=104, 63% vs. found *n*=8, 14%, *p*=.001);
- Use a vehicle in the offence (brought *n*=36, 22% vs. *n*=5, 9%, *p*=.019);
- Use a surprise approach (brought *n*=82, 50% vs. found *n*=16, 28%, *p*=.003);
- Use a knife (brought *n*=142, 86% vs. found *n*=37, 65%, *p*=.001).

Outside of these, the variables of using a firearm (brought, *n*=15, 9% vs. found *n*=1, 2%, *p*=.049) and involving the victim in the offence sexually (found *n*=92, 56% vs. brought *n*=23, 40%, *p*=.032) both initially achieved significance but did not remain following Benjamini–Hochberg correction. Elsewhere, whilst not reaching significance, those offenders that brought a weapon demonstrated higher levels of using the weapon

to threaten (brought *n*=23, 14% vs. found n=3, 5%. p=.058); verbal aggression (brought *n*=137, 83% vs. found *n*=42, 74%, *p*=.091) and for their offences to involve an abduction and false imprisonment aspect (brought *n*=41, 25% vs. found *n*=8, 14%, *p*=.062).

In comparison, those who found the weapon at the scene were significantly more likely to:

- Use drugs[9] (found *n*=7, 12% vs. brought, *n*=1, 1%, *p*=.001);
- Use alcohol[10] (found *n*=13, 23% vs. brought *n*=17, 10%, *p*=.018);
- Attack at a familiar location (found *n*=30, 53% vs. brought *n*=39, 24%, *p*=.001);
- Have a duration of contact between victim and offender of longer than four hours (found *n*=19, 33% vs. brought, *n*=25, 15%, *p*=.004);
- Attack indoors (found *n*=30, 53% vs. *n*=35, 21%, *p*=.001);
- Adopt a confidence approach (found n=38, 67% vs. brought *n*=82, 50%, *p*=.019);
- Include a burglary motive (found n=14, 25% vs. brought, n=19, 12%, *p*=.018);
- Use of a blunt weapon (found *n*=15, 26% vs. brought *n*=16, 10%, *p*=.003);
- Involve an offender younger than the victim (found *n*=31, 54% vs. brought *n*=61, 37%, *p*=.016).

Outside of the above differences, the variables of encounter victim physical resistance (found *n*=39, 68% vs. brought *n*=91, 55%, *p*=.054) and use violence deemed

[9] Presence of such a variable is sometimes difficult to ascertain and as such will not always be reliable.
[10] Presence of such a variable is sometimes difficult to ascertain and as such will not always be reliable.

unnecessary (found *n*=23, 40% vs. brought *n*=45, 27%, *p*=.048) both initially achieved significance, but did not remain following Benjamini–Hochberg correction. The variable of inflicting a head injury was more likely in those who found the weapon (found *n*=22, 39%, vs. brought *n*=45, 27%, *p*=.077) although it did not reach significance.

Identify those behaviours that best predict how the weapon was obtained.

The 'rule of 10' (Peduzzi, Concato, Kemper, Holford & Feinstein, 1996) was followed, that is a guide as to the number of cases in the smallest group to be predicted per predictor variable entered into the final logistic regression model. Given the smallest group, that of the weapon being brought included 57 cases - it was decided to enter the **six significant variables** with the largest effect sizes. The final model derived through logistic regression is presented in Table 2 and has a moderate strength (Nagelkerke R Square .433; Cox & Snell R .296; *p*=.001). Those variables in the model significantly associated with bringing the weapon were an outdoor offence location, use of knife and victim age. The offender's use of drugs and attacking in a familiar location were the variables related to the offender finding the weapon at the scene. ROC analysis was conducted to assess the predictive accuracy of the model using the predicted probabilities generated by the leave-one-out logistic regression (see figure 1). The AUC was .75 (SE=.039, 95% CI=.67-.83) representing a moderate level of prediction (*p*=.001) (Hosmer, Lemeshow & Sturdivant 2000).

Table 2: Significant factors associated with the weapon being brought or found

Variable name	B Coefficient	P value	OR	95% lower	95% Upper
Outside offence	1.959	.000	7.095	2.458	20.483
Knife	1.334	.003	3.795	1.598	9.012
Victim Age	.036	.009	1.037	1.009	1.065
Familiar location	-1.101	.007	.333	.150	.739
Offender Drug Use	-2.770	.015	.063	.007	.583
Constant	-.428	.764	.652		

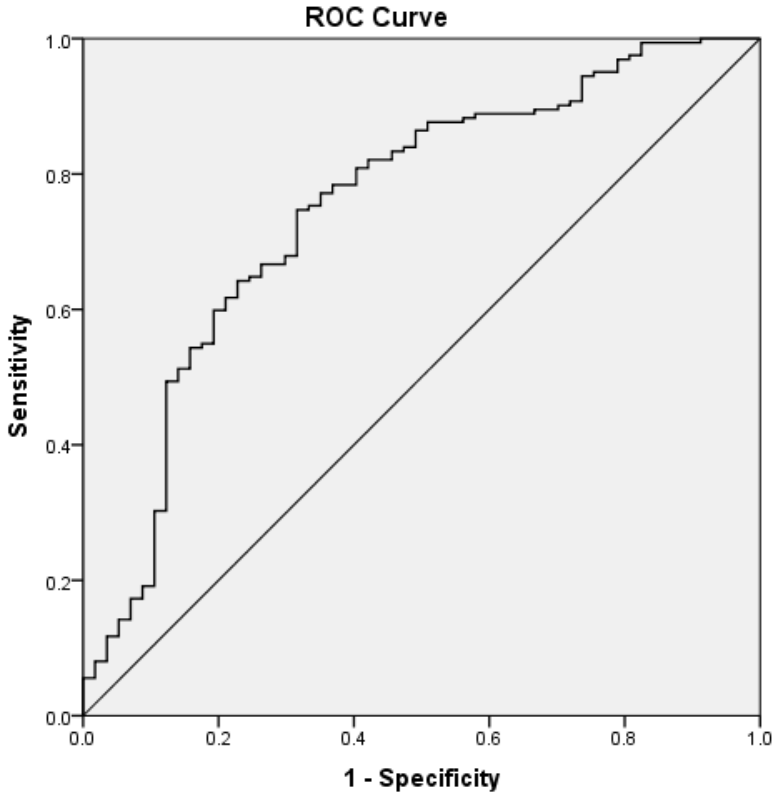


Figure 1: the ROC curve illustrating the predictive accuracy of the leave-one-out logistic regression model

Discussion

The paper focused upon weapon enabled lone stranger sexual offenders with specific attention as to how the weapon was obtained. The aspiration of the paper was to use how the weapon was obtained at the crime scene as a test of wider criminal themes (e.g., organised/disorganised) through which to explore the homology assumption. This was deemed possible given that the organised/disorganised theory is clear in expecting both demographic and behavioural differences between offenders that are organised compared to disorganised. A variety of findings were obtained that require further interpretation.

An evidence of homology?

When comparing offenders that found the weapon at the scene against those that brought it to the offence we see mixed results in terms of homology. For offender demographics; there were no significant differences between these two offender types in terms of offender age, employment, offender ethnicity, relationship status, student status and frequent criminal background. The authors note that offender mental disability approached significance, but this could be a statistical anomy given the variable applied to a minority of both groups. On a similar note, generally there were no differences between victim demographics (e.g., victim drug user, victim physical or mental disability, victim gender) between the groups. The only significant difference found was that victims were significantly older when the weapon was found as compared to being brought by the offender (e.g., 34 vs. 25 years of age). Similarly, victim age was a significant predictor in the final model.

This finding regarding victim age could be interpreted as those who find the weapon felt they required it precisely because the victim was older (and older than themselves). This is in accordance with the physical strength hypothesis (Heide, 1993), which discusses that younger offenders are more likely to use weapons for this specific purpose. Heide's (1993) work was in relation to parricide, but it plausible the core aspect is relevant for sexual offenders. This also aligns to the concept that sexual offenders are rationalising and capable of assessing risk and reward (Beauregard *et al.,* 2007) - offenders may deem a weapon necessary for older, less vulnerable or physically stronger victims in order to gain control or compliance. This is again consistent with previous research demonstrating offenders are more likely to use weapons when the victim is male (Pino & Meir, 1999) and as such continues to generate learning around offender behaviour.

This thread also raises explicitly the concept of victim targeting within weapon-enabled offenders. Previous research had found clear victim age preferences in the majority of sexual offences, victims of sexual crimes are generally young. Indeed, if viewed from an evolutionary perspective, it is hypothesised that offenders assess the fertility and attractiveness of the rape victim (Thornhill & Palmer, 2000). Human female fertility begins to decline in the late 20's (Dunson, Colombo & Baird, 2002) and this is the typical age profile of victims of rape (Shields & Shields, 1983, Thornhill & Palmer, 2000). Similarly, Goodwill and Alison (2007) highlight the concept of 'near-peer' within rape, which theorises that offenders target victims similar to societal age preferences for sexual partners. Echoing this, is it perhaps a coincidence that the average victim age when the weapon was brought was 25 years of age and significantly older (i.e., 34 years) when a weapon was found. Again, one interpretation is that

bringing the weapon is demonstrating an evidence of planning and preference towards victim selection. This is consistent with previous research suggesting evidence of planning is inversely related to victim age (Goodwill & Alison, 2007; Guay *et al*., 2001; Harry, Pierson & Kuznetsov, 1993).

However, outside of the victim age differences between groups, there were no demographic differences when comparing those offenders who found versus brought the weapon. To reiterate, this is relevant as the organised/disorganised theory would predict demographic differences (e.g., organised offenders ought to be older, more likely to be employed) and the current results clearly do not support such assumptions. In this respect, the results initially appear to support previous studies that question the value of the organised/disorganised theory (Canter *et al.,* 2004) and those unable to demonstrate the homology assumption (Doan & Snook, 2008; Mokros & Alison, 2002; Woodhams & Toye, 2007).

Is there value in the organised / disorganised dichotomy

The lack of demographic differences between the groups would appear to challenge both the organised/disorganised theory and the homology assumption. However, when the broader crime scene behaviours were incorporated, a range of significant differences was found between the groups of which many were entirely consistent with the organised/disorganised theory.

At the bivariate level, those that brought the weapon were more likely to have a duration of contact between offender and victim of under an hour, use a vehicle, a surprise approach and use a knife. Comparable here are the variables of sexually

involving the victim and using a firearm[11] that were initially significant but did not remain after Benjamini–Hochberg correction. The significant predictors of bringing the weapon in the final model were an outdoor offence, use of a knife and younger victim age. Generally, such crime scene behaviours have been discussed within an organised framework in terms of facilitating the offence, enabling control and achieving sexual aims/goals (Block & Block, 1992; Ressler, Burgess, & Douglas, 1988; Salfati & Taylor, 2006).

In comparison, those that find the weapon at the scene demonstrated significantly increased levels of alcohol use, drug use (also a significant predictor in the final model) and use of a blunt weapon. Using violence was initially significant but did not remain significant following Benjamini–Hochberg correction. Each of these crime scene behaviours have been reported by other researchers as indicating a lack of planning (Goodwill & Alison, 2007) and otherwise proxies for disorganisation (Ressler, Burgess, & Douglas, 1988).

However, upon closer inspection of the results the picture is less clear in terms of levels of organisation. To illustrate, there were no differences in the use of restraints, stealing from the victim or using a forensic precaution - variables that *ought* to be more frequent within organised offenders (Ressler, Burgess, & Douglas, 1988). Likewise, the majority of both groups used some type of precaution during their offence. In this sense, we are demonstrating that the majority of weapon-enabled sexual offenders express evidence of planning within their offence. The concept of a *wholly* organised or

[11] It is not surprising so few firearms were 'found' given that in the UK firearms are tightly controlled by the law and require certificates for ownership (Home Office, 2013).

disorganised sexual offender seems overly simplistic, indeed such a criticism has been directed towards the theory previously (Canter *et al.,* 2004) and as such should feed into practical learning for investigations.

There were other inconsistencies within the results; for example, attacking in a familiar location was a significant predictor of finding the weapon in the final model, which would initially appear to be at odds with a disorgansied offender. However, attacking in a familiar location has been previously discussed in connection with low impulse control, opportunism and impulsivity (Burgess & Ressler, 1985; Farrington *et al*., 1990; Godwin, 2002; Gottfredson & Hirschi, 1990; Hazelwood & Warren, 2000; Prentky & Knight, 1991). When also viewed alongside the increased likelihood that offenders who found the weapon were more likely to demonstrate a burglary aspect (see also Toch & Adams, 1994) - there is a compelling case that this group are criminally minded opportunistic offenders that deem it necessary during the offence to find a weapon as opposed to being disorganised. While it is possible investigators may not know whether an offence is taking place in a familiar location until after the crime has been solved, information around where the weapon was obtained can be of value to investigators if it can be established the offender obtained a weapon at the scene. As in such cases the offender was significantly more likely to be attacking in a familiar location. Overall, similar to Beauregard and Field (2008), the results demonstrate some support for the organised/disorganised dichotomy albeit only in a limited way.

Many authors have discussed the importance of situational factors within the concept of offender profiling (e.g., Goodwill & Alison, 2007; Mokros & Alison, 2002). There are some demonstrations of these wider issues within the current research, for

example, the offenders who found the weapon were more likely to use drugs, alcohol and encounter victim resistance[12]. In these cases, it may also be relevant that such offenders were, as discussed earlier, younger than the victim. All of these issues are potentially subjective and could result in many different outcomes demonstrating the complexity in attempting to form predictions within the offence based upon only crime scene behaviours without wider context, individual and situational complexity. This stresses the importance of potential moderating factors within profiling and the challenge to incorporate offender individual differences within any analysis given the potential subjective reactions or experiences.

Limitations

Some criticisms of ViCLAS coding in Canada have been made (Snook, Bennell, Taylor, House, MacDonald & Luther, 2012), however, the method of populating the database differs between the UK and Canada. The UK SCAS incorporates extensive quality assurance and training procedures and data entry is conducted by trained crime analysts, not police officers. A quality control guide assures consistency in data entry.

The use of the organised/disorganised dichotomy in this study could be seen by many as a limitation given many of the academic critics (Canter *et al.,* 2004). Indeed, in this respect the theory is controversial, albeit longstanding and established. The rationalisation of using this model to underpin the work was to draw influence in respect of a crime scene behaviour (weapon obtainment) that appeared well matched and able to illustrate a broader behavioural theme. The results partially demonstrate the

[12] This was initially significant but did not remain following Benjamini–Hochberg correction.

purpose of supporting the use of weapon obtainment as a proxy of levels of organisation.

Furthermore, our modest sample size (that is a total of 165 offenders who found the weapon and 57 who brought it to the offence) could be perceived a limitation. Indeed, in this respect, it is most appropriate to view the findings as preliminary and in need of future replication. However, the sample size is comparable to similar studies, such as Brennan, Moore and Shepherd (2010) (15 weapon-using offenders, 15 non-violent offenders and 10 violent offenders) or Beauregard and Field (2008) (a total of 85 sexual murderers and within this a group of 32 that moved the body and 53 that did not move the body). In addition, both the Benjamini–Hochberg correction, Leave-one-out cross validation and ROC analysis was conducted to enhance the statistical rigour of the study.

Conclusion

The aims of this manuscript was to explore how the weapon was obtained at the crime scene as a test of wider criminal themes through which to explore the homology assumption. Understanding such subtleties may be able to inform practitioners around motivations, actions and hold implications for risk assessment or treatment of offenders. The lack of homology between whether the weapon was found or brought and offender characteristics is of relevance for offender profiling and equally could inform practical investigations. The weight of evidence suggests that the organised/disorganised theory, whilst providing some value, is perhaps overly simplistic and not in itself adequate to classify offenders or base investigative decisions upon.

CHAPTER 4

EVIDENCE OF PLANNING AND VIOLENCE: A PSYCHOLOGICAL CONCEPTUALISATION OF WEAPON USE WITHIN SERIOUS SEXUAL ASSAULT

Chapter rationale

Chapter 4 continues the progression and empirical study into weapon-enabled sexual offenders. Returning to the themes of 'planning' and 'emotional use of the weapon' that were derived in the review of the literature (Chapter 1), the current chapter seeks to verify the presence of such themes as underlying facets of weapon-enabled sexual offending. To achieve this, the chapter utilised Multi-dimensional Scaling (Canter, Hughes, & Kirby, 1998, Goodwill, Alison & Humann, 2009), a method that is able to use dichotomous crime scene behaviours and present them in a two dimensional space in terms of their underlying relationship to one another. Such an analytical technique is viewed by many as a controversial approach given the potential subjectivity of interpreting the output, the low likelihood of supporting a null hypothesis and the risks of drawing out conceptual importance from high frequency variables (Taylor *et al.,* 2012). The current chapter sought to adopt a theoretical starting point and a 'centre of gravity' approach to mitigate many of the drawbacks of the Multi-Dimensional approach in deriving learning about weapon-enabled sexual offending.

Abstract

The subtleties and psychological implications of weapon-enabled crime have not been explored adequately in the previous literature. Levels of violence and evidence of planning are proposed to be key themes underpinning weapon-enabled sexual crime and the paper sets out to specifically test this viewpoint. A sample of 316 convicted, weapon-enabled, sexual offenders against strangers were analysed using Multi-Dimensional Scaling. The analysis was theory led and incorporated a 'centre of gravity' approach to attempt to overcome many of the perceived weaknesses of the MDS approach. Four broad thematic representations are interpreted within the sample reflecting differing levels of violence and levels of planning (criminal opportunity; criminal control; destructive violence; destructive weapons). Whilst these themes differ in terms of crime scene behaviours, type and use of the weapon, offender - victim age relationship and location of offence, there were no obvious demographic differences: something that poses a challenge to the homology assumption. Finally, the authors argue that weapon use should be regularly integrated into the analysis of offender behaviour and that the proposed conceptualisation may offer potential in the understanding of other non-sexual and violent crimes.

Introduction

Much of the literature on weapon-enabled crime has had a focus on prevalence via police records, victimisation surveys or hospital statistics (Office for National Statistics, 2014a; Rand, 2008) often with a strong focus on youth violence and weapons (Barlas & Egan 2006; Silvestri, Oldfield, Squires & Grimshaw, 2009; Thurnherr, Michaud, Berchtold, Akre, & Suris, 2009). There is value in such epidemiological data for monitoring police performance or the development of crime reduction strategies, but less value from a psychological perspective. A literature review conducted by Brennan and Moore (2009) was a useful step forward in the general understanding of weapons, albeit the review omitted forensic psychology literature. Weapons have been included, 'in-part', in many studies, but have rarely been the primary focus of analysis (Dawson & Goodwill, 2013), the authors posit the potential value of analysing the use of weapons, arguing that this is a crime scene behaviour of import that may be able to generate new insights into sexual offending.

Two of the most in-depth studies to demonstrate a focus on weapons in terms of criminal behaviour are Kleck and McElrath (1991) and Wells and Horney (2002). Kleck and McElrath (1991) examined violent incidents among strangers discussing weapons largely in terms of the power achieved and in particular emphasising the various stages of a crime and the different roles played by weapons. They also reported that while certain weapons (firearm and knife) appear to inhibit attack and reduce probability of injury, once an injury occurs, the probability of death increases. In contrast, Wells and Horney (1991) examined over 2000 violent and potentially violent events described by offenders to assess the role of weapons. They reported that the offender's intent to injure did not appear to play a role in determining an attack. Both of

these studies conclude that weapon enabled crime is complex and able to produce seemingly paradoxical results (e.g., gun attacks being less likely to result in victim injury than other weapons) and that weapon violence appears to depend upon the stage of a given conflict (Kleck & McElrath 1991; Wells & Horney, 2002).

To progress the study of weapons and forensic psychology - a literature review (see Chapter 1) was conducted by the authors of the current chapter (Dawson & Goodwill, 2013) which specifically considered the use of weapons within violent and sexual offences drawing upon both general and the offender profiling literature. A variety of motivational sub-sets were identified - issues around *control*, *power and intimacy, anger, opportunism* and *deviant use of the weapon*. In summary, the authors collapsed these sub-sets into two dominant themes representing *evidence of planning* (e.g., opportunism and control) and the *emotional use of a weapon (e.g., anger and power, and intimacy).* The aim of the chapter is to build upon this and test the value of these themes within a sample of weapon-enabled sexual offenders. For a full background to these themes readers are referred to Chapter 1 (Dawson & Goodwill, 2013), but for the purposes of the chapter, there follows an overview.

Emotional use of the weapon

This theme sought to collapse issues surrounding anger, power and intimacy regarding the use of a weapon. There are numerous researchers that include these aspects within their explanations of rape: some examples include themes of *'violent' and 'exploit'* (Salfati & Taylor, 2006); *'hostility'* (Canter, Bennell, Alison & Reddy, 2003); *'pervasive anger, vindictiveness'* (Knight, Warren Reboussin & Soley, 1988);

'anger-retaliatory', 'power-reassurance', 'power-assertive' (Groth & Birnbaum, 1979; Hazelwood & Burgess, 1987).

At the core of this theme is the concept of expressive aggression, in that the violence used goes beyond what is required to merely complete the offence and appears related to a specific intent to harm the victim (Salfati & Taylor, 2006). This aggression is perceived to involve an emotional component for the offender; potentially including a perceived level of personal 'rights' being wronged or retaliation (Bartol, 1991). Furthermore, Beauregard, Lussier and Proulx (2007) report that expressive violence was positively linked to offender alcohol use.

As an illustration, Rogde, Hougen and Poulsen (2000) examined homicide by sharp weapons in two Scandinavian capitals between 1985 and 1994 reporting that female victims on average received lesions in three to four anatomical regions compared to males who received injuries most frequently to one area. Rogde *et al.,* (2000) hypothesised that female victims were more often killed by someone closely related to them, and multiple wounding was likely evidence of an emotional connection to the victim. This is supported by other literature reporting head/face wounding, multiple wounding and a relationship to the victim (Haugen, Slungard & Schei, 2005; Pratt & Deosaransingh, 1997; Salfati, 2000; Salfati & Canter, 1999). This violence is ‘expressive’, potentially driven by the emotion given the connection between victim and offender. The variables are attributed to anger and violence, the aim here appears to be to harm the victim and the weapon can facilitate this desire.

Evidence of planning and weapon use

The ability of the offender to show forethought or to plan their offence has long been recognised and gleaned from crime scenes (the *'control'* theme Canter, Bennell, Alison & Reddy; Cornish & Clarke, 1986; Goodwill & Alison, 2007; Hazelwood & Warren, 2000; Ressler, Burgess, Douglas, Hartman & D'Agostino, 1986). Likewise, little evidence of planning, whether due to lack of forethought, self-control or impulsivity has been discussed within the literature on an array of criminal activities (Cohen *et al* 2002; Craig, Browne & Stringer, 2003; Gottfredson & Hirschi, 1990; Prentky & Knight, 1986; Raymond, Coleman *&* Miner, 2003).

Beauregard and Leclerc (2007) interviewed 69 serial sexual offenders who had committed offences against strangers. Offenders talked of using the weapon to control, intimidate and prevent the victim resisting. Others highlighted the functional value of the weapon such as in assisting to break into the house. One offender even differentiated between types of weapon assigning them to specific crimes:

*'For night attacks, I used a knife since I was able to get close to the victim. Then she would be afraid to move not to get cut and was very easy to control. For day attacks, I had a fake gun. It was better to threaten a victim with a gun when she was further away; she knew I could shoot her from that distance, which isn't the case with a knife'. (*Beauregard & Leclerc, 2007, p. 123).

The 'organised/disorganised' (Ressler *et al.,* 1986) dichotomy is one theory which attempts to predict offender characteristics based upon crime scene behaviours. It has been a popular conceptualisation; although one that has attracted criticism around

a lack of scientific underpinning and validity (Canter, Alison, Alison, & Wentink, 2004; Snook, Cullen, Bennell, Taylor, & Gendreau, 2008). Within this theory, a crime that appears to demonstrate high levels of planning (e.g. hiding a victim body, not leaving evidence at the scene, bringing a weapon to the crime) would be taken to be 'organised', resulting in predictions of an offender with above average intelligence and who is in employment. Similarly, a disorganised offender may obtain a weapon at the scene or show a lack of planning. Related to the lack of planning would be opportunistic crimes: Knight, Warren, Reboussin and Soley (1988) as part of the MTC:R3 classification of rapists present a major theme termed 'opportunism'. Such crimes are influenced by contextual and environmental factors as opposed to any deep-seated motivations such as expressive anger. These individuals are described as showing little planning or preparation and the primary aim of the rape is sexual gratification.

A conceptualisation of weapon use within serious sexual assault

Violence and evidence of planning as inferred by crime scene behaviours are proposed to be key themes underpinning weapon-enabled sexual crime. It was hypothesised that these two themes would be visible within a 2x2 model of sexual crime yielding different thematic representations of weapon use.

Method

Participants

The sample was provided by the Serious Crime Analysis Section (SCAS) of the Serious Organised Crime Agency (SOCA). SCAS is an analytical unit with national responsibility to carry out analytical work on behalf of all police forces. SCAS collates

and analyzes information on serious crimes that fulfill its criteria, predominately stranger murders, and serious sexual assaults and/or rapes. The data were captured on the Violence Crime Linkage Analysis System (ViCLAS). The sample consisted of all single, stranger serious sexual assaults held by the SCAS from 1973-2008. There were 1618 assaults, all of which took place in the United Kingdom. The majority of cases (1375, 85%) were committed post-2000[1]. A total of 316 (20%) of this overall sample were weapon-enabled and these offences were the focus of the current study.

All weapon-enabled offenders were male. The majority of offenders were of White European ethnicity (*n*=231, 73%). Ages were available for the majority of offenders (*n*=310, 98%): the mean age was 27 years, albeit with a wide range (14-63, *SD*=9.4). One-quarter (*n*=73, 23%) of offenders were described as having a frequent criminal lifestyle. Nearly one-half (*n*=145, 46%) of offenders were employed in some way; fewer were students (*n*=94, 29%) or unemployed (*n*=59, 19%).

Procedure

The anonymised data were provided to the authors in the form of an Microsoft Excel spreadsheet containing variables that described the basic demographics of the victim and offender (where known), weapon use, how the offender approached the victim, offence behaviours, levels of victim injury, precautions used by the offender and any verbal dialogue by the offender during the offence. No inter-rater reliability was possible, although the data were quality assessed by SCAS before it was sent to the researchers and all data inputted into the SCAS database is completed by a team of highly trained individuals, and is done in-house in a controlled environment. A 'quality

[1] The data were received in 2008 as part of the first author's PhD study.

control guide' is also utilized by everyone inputting data into the database, which is designed to ensure consistency in decision-making.

All variables in the data were binary (i.e., the behaviour was present or not). Variables above 95% or below 5% frequency were removed in accordance with previous research that argues they are not valuable in terms of potential themes given their frequency (Canter, 1994). The variables that were removed are as follows; assault (99%); sexual assault (99%); severe wounding (3%), any verbal theme (98%); attacking in a unfamiliar location (2%); all body specific injury sites outside the head or face (i.e., genital 0.3%; breasts 0.9%; hands 0.3%); immediate violence (4%); offender separated (2%); offender divorced (4%); offender physical disability (2%); offender homeless (2%); a blitz approach (2%); masturbates the victim (2%).

Groups of less frequent variables were collapsed upwards into single variables in thematically similar cases. These included a 'sexual dysfunction' variable being created that merged the individual variables of 'retarded ejaculation', 'premature ejaculation' and 'inability to maintain erection'; a 'degrading sex variable' that merged 'object insertion', 'anal sex', 'ejaculating on the victim'; a 'verbal aggression' variable that merged 'offender insults victim' and 'offender uses abusive language'; a personal verbal theme that merged the offender 'reassuring', 'victim enjoyment', 'relationship', 'complimenting' or 'apologising' to the victim; a 'forensic precautions' variable that merged the offender using 'gloves', 'condom', 'destroying forensics' or 'bathing/cleaning the victim' after the offence. A small number of new variables were created by summing from the data, for example, to examine the more extreme cases such as the offender presenting 'more than one weapon', 'two or more head or facial injuries' and

'two or more precautions'. See Table 1 for the full list of variables, their description and frequency.

Multi-dimensional scaling (MDS) was used to examine the latent structure of the variables. MDS is based on the assumption that underlying structures will be identified by examining the relationship each variable has with every other variable. Analysis was conducted with SPSS Statistics 20. The PROXSCAL procedure has been identified as the most appropriate to implement (Goodwill, Alison & Humann, 2009) and was therefore conducted. The relationships between variables were measured using Jaccard's coefficients (Canter, Hughes, & Kirby, 1998; Jaccard, 1908). Within an MDS solution, high frequency co-occurring variables are situated in the centre of the plot, with increasingly lower frequency co-occuring variables towards the periphery.

MDS attempts to find a structure in a set of proximity measures between variables. Taylor, Donald, Jacques and Conchie (2012) note the frequency of the MDS approach over the past two decades in generating models of offending types and broadly critique the use of MDS where conceptual import is derived from the behaviours at the centre of the MDS output. The implications of the work of Taylor and colleagues are covered in the discussion section of the current chapter.

Table 1: List of variables and the frequency/percentage of occurrence in the sample of sexual offenders.

Variable name	Description	Percentage (*n*)
Abduction	Offence included abduction of the victim	22% (69)
Frequent_criminal	SCAS data reported a frequent criminal lifestyle for the offender	23% (73)
Familiar_location	offence took place at a familiar location for the offender	29% (93)
Vehicle_used	a vehicle was used during the offence	17% (54)
Violence_after_contact	violence was committed after initial contact between victim and offender	11% (36)
Violence_during	violence was inflicted during the offence	28% (89)
Weapon_threat	the weapon was used to threaten during the offence	27% (86)
Weapon_displayed	the weapon was displayed during the offence	55% (175)
Weapon_used	the weapon was physically used during the offence	23% (72)
Weapon_brought	the weapon was brought to the crime by the offender	74% (165)
Weapon_found	the weapon was obtained at the scene during the offence by the offender	18% (57)
Confidence	a confidence approach was used by the offender (e.g. posing as authority, engaged in conversation, asked for assistance)	53% (166)
Surprise	a surprise approach was used by the offender (e.g. lay in wait, sneaking up, victim sleeping)	45% (141)
Burglary	an element of the crime included burglary	16% (49)
No_injury	the offender did not physically injury the victim	53% (166)
Minimal	minimal injury was inflicted upon the victim	66% (103) total
Moderate	moderate injury was inflicted upon the victim	30% (47)
Violence_on_resistance	violence was committed upon victim resistance	23% (73)
Violence_not_upon_resistance	violence was committed not upon victim resistance	32% (100)
Vaginal	any vaginal penetration	74% (234)
Theft	an element of the crime included theft	35% (111)
Own_safety	Offender showed a concern for their own safety during the offence (telling victim not to go to the police, safe departure)	42% (131)
Alcohol	Offender alcohol use was apparent at the offence	14% (43)
knife	weapon was a knife or sharp instrument	81% (255)

Gun	Weapon was a gun	8% (24)
Blunt	weapon was a blunt object	13% (42)
More_then_1_weapon	Offender reported to have had more than one weapon	7% (22)
Resistance	victim resistance during the offence either verbal or physical	91% (286)
Verbal_aggression	offender verbal aggression during the offence (insults or abusive language).	82% (260)
Forensic_precautions	offender demonstrated forensic precautions (i.e. gloves, condom, destroying forensics or wiping victim clean).	17% (56)
Protect_identity	offender appeared to protect their identify (disguise, covering victim eyes, telling the victim not to look)	23% (73)
KissesFace	offender kissed the face of the victim	42% (131)
Victim_sex_invovle	the victim was sexually involved in the offence (e.g. oral sex or telling the victim to participate),	52% (164)
Sexual_verbal_theme	offender displayed language of a sexual nature	58% (184)
Personal_questions	offender asked personal questions during the offence to the victim (i.e ask name).	59% (186)
Verbal theme - personal/ relationship communication (aka nice talk)	offender polite to victim (i.e reassures, apologises, compliments, relationship, victim enjoyment)	43% (136)
Sexual_behaviours	offender performs sexual behaviours (non vaginal / anal penetration - e.g. fondling, kissing, masturbating)	25% (80)
Degrade_sex	offender degrading sexual behaviours (i.e object insertion, anal penetration, ejaculating on victim)	32% (100)
Sex_dysfunction	offender sexual dysfunction - individual 'retarded ejaculation', 'premature ejaculation' and 'inability to maintain erection'	10% (31)
Two_face_injury	two or more facial injuries during the offence	20% (62)
Two_ormore_precautions	offender used two or more precautions during the offence	29% (90)
AnyRestraint	the offender used restraints on the victim	7% (23)

Results

Analysis of Crime scene behaviours

The MDS analysis produced a two-dimensional solution (see Figure 1). Stress levels in an MDS measure the goodness of fit of the data to the two-dimensional space upon successive 'fitting' iterations. Fitting in effect, is completed by maximising the relationship in which the closer any two points are to one another, the more likely it is that the actions they represent co-occur across offences. The two dimensional solution appears to be a good fit (Schiffman, Reynolds & Young, 1981) in that the stress measures are low (Stress-I .2; Stress II .48 and S-Stress .17) and the DAF (.94) and Tuckers scores (.97) are high.

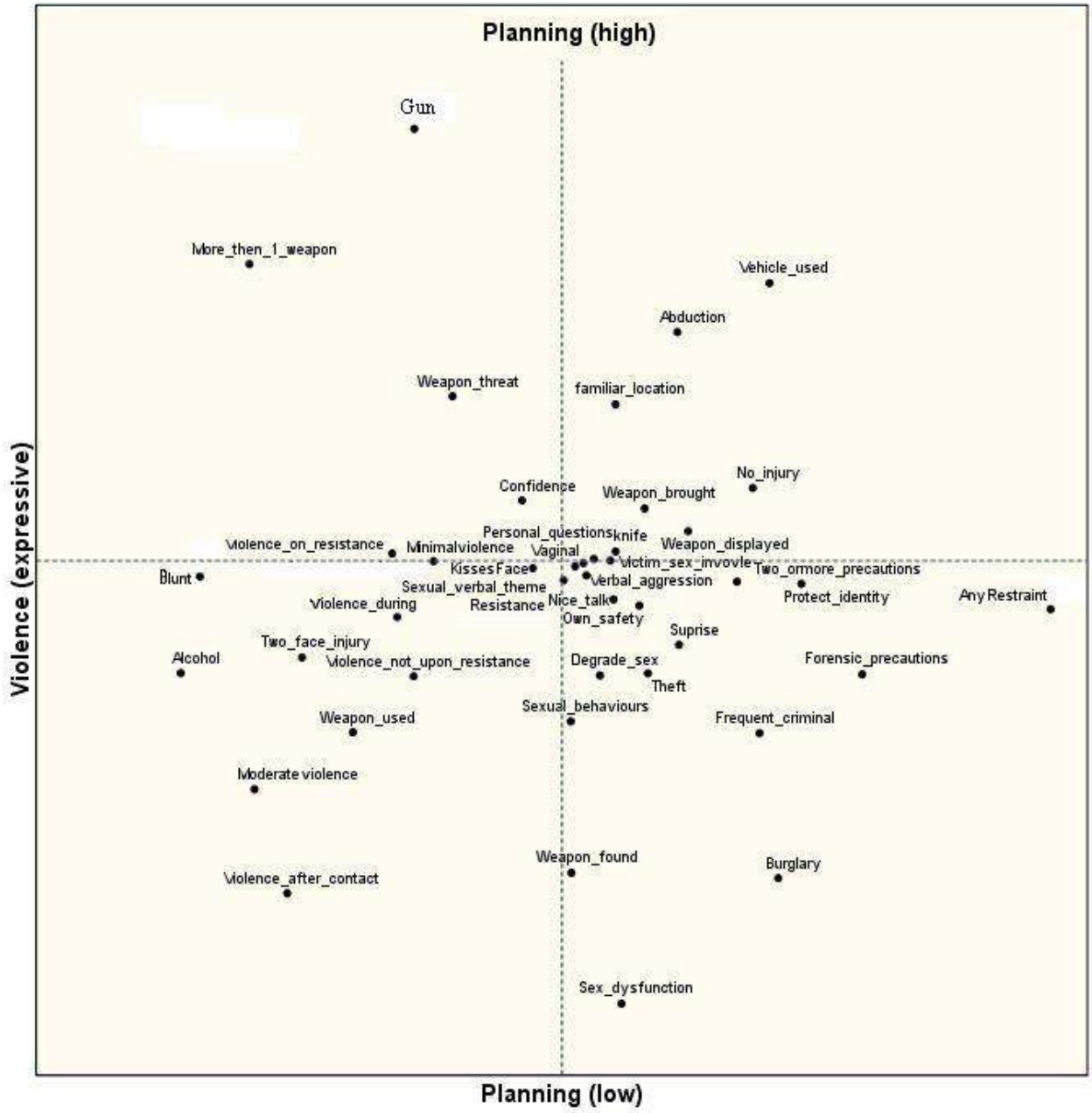


Figure 1: A presentation of weapon-enabled serious sexual offenders

In an MDS plot, the most frequent behaviours are located in the centre of the plot. In the current dataset, these frequent behaviours were victim resistance (91%), vaginal penetration (91%), knife-use (81%) and verbal aggression (82%) and they co-occur near the centre of the plot.

Interpretation of the MDS output reveals the presence of two behavioural themes inferred through the crime scene behaviours, namely: *violence*, with an expressive, (i.e., blunt weapon, injury, head/face wounds) to instrumental (i.e., frequent criminal lifestyle, two or more precautions, use of restraints) dimension running from left to right, and *planning with a* high (i.e., vehicle use, abduction element, firearm) to low (i.e., weapon found, burglary element) dimension running from top to bottom. It is also possible to separate the output into a 2x2 model of weapon-enabled sexual crime forming four categories.

Behaviours located in the top right of the plot were interpreted as 'criminal control' (high planning/ Instrumental violence): these behaviours infer both criminal experience (such as bringing the weapon, two or more precautions bordering the theme) and those that can be related to apparent control (such as using a vehicle, displaying the weapon and an abduction element).

Behaviours located in the top left were interpreted as ‘destructive weapons’ (*high planning/ expressive violence*) given the importance of weapons within this theme, that is the use of a firearm and more than one weapon (and blunt weapon bordered this theme): both can be inferred to demonstrate high levels of planning and

the willingness to use an expressive method, although the use of violence appears to be primarily upon resistance.

Behaviours located in the bottom right were interpreted as 'criminal opportunity' (*low planning/instrumental violence)* given that the behaviours indicate criminal experience (forensic precautions, a theft element, a burglary element, the frequent criminal lifestyle variable) and a seemingly low planning/opportunistic aspect to the sexual offence (a surprise attack and finding the weapon at the crime scene). This theme also included a number of sexual variables (e.g., sexual behaviours, sexual dysfunction, degrading sexual behaviours).

Behaviours located in the bottom left were labelled 'destructive violence' *(low planning/expressive violence)* given that the crime scene behaviours demonstrate unnecessary violence during the offence, two or more head/face injuries, moderate injury and violence not upon victim resistance, the involvement of alcohol and a blunt weapon.

Classifying the themes

MDS has attracted criticism and generated considerable debate as to its merits in the analysis of criminal behaviour (Taylor *et al.,* 2012; Goodwill, Alison, & Humann, 2009; Trojan & Salfati, 2008). In an attempt to overcome a perceived weakness of the subjectivity in the interpretation of an MDS output, a 'centre of gravity' technique was conducted (Goodwill, Stephens, Oziel, Yapp & Bowes, 2012). Through the MDS procedure each individual variable generates a unique spatial coordinate (on both X and Y coordinates to represent its position on the final output. By summing the

X and Y coordinates separately for each offender and dividing by the total number of variables, it is possible to identify the mean X and Y coordinates for each offender for all of their crime scene behaviours. This provides a single coordinate or centre of gravity per offender on the two dimensional output representing the themes of planning and violence. The objective is to classify an offender into their predominant behavioural theme based upon the majority of their behaviours. This can be seen in Figure 2 where each dot represents an offender's overall position on the two dimensions.

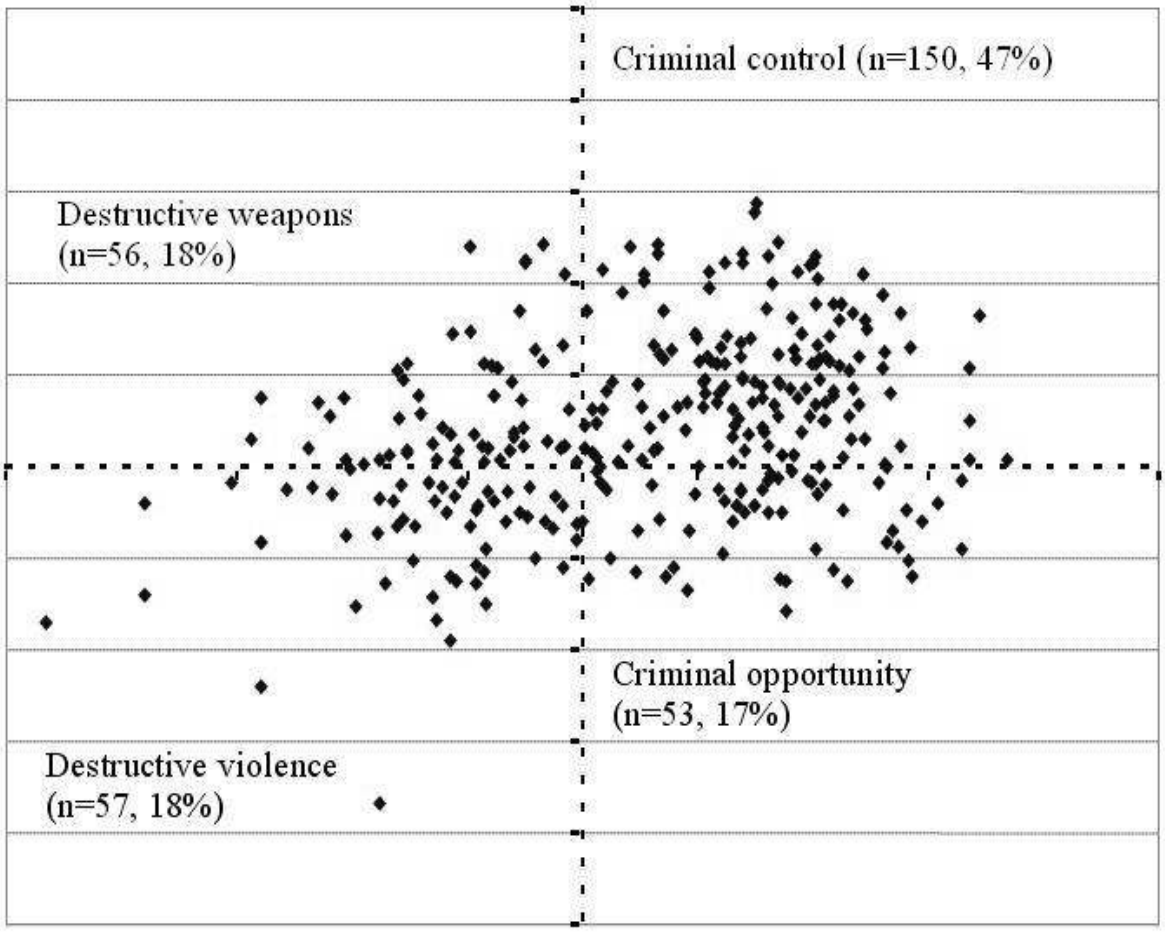


Figure 2: The centre of gravity demonstrating dominant behavioural theme for weapon-enabled mean coordinates

The results of the centre of gravity analysis indicated that of the 316 offenders just less than one-half could be attributed to the criminal control theme (*n*=150, 47%). The remaining offenders were relatively evenly spread across the three remaining types: destructive weapons (*n*=56, 18%), destructive violence (*n*=57, 18%) and criminal opportunity (*n*=53, 17%).

Classification of the offenders into one of each of these four themes allowed for further analysis to investigate any key differences in terms of demographic characteristics of victim and offender or offence location. A series of chi square analyses and ANOVAs were conducted to examine differences on these variables between the themes. There were no significant differences in mean offender age, marital status or employment between the four groups. However, there were other significant differences that emerged (see Table 2 for an overview of group differences).

Table 2. Group differences between the four behavioural themes of weapon-enabled sexual offenders.

Variables	Criminal Control	Destructive Weapons	Criminal opportunity	Destructive violence	$\chi_{2 / T}$	*p*
Weapon found	16 (11%)	7 (13%)	21 (40%)	19 (33%)	29.2	.001
Weapon brought	98 (65%)	24 (43%)	25 (47%)	24 (42%)	14.8	.002
Weapon threat	40 (27%)	32 (57%)	4 (8%)	10 (27%)	38.3	.001
Violence not upon resistance	9 (6%)	31 (55%)	15 (28%)	45 (79%)	119.3	.001
No injury	123 (82%)	10 (18%)	31 (59%)	2 (4%)	134.9	.001
Minor injury	22 (15%)	31 (55%)	19 (36%)	20 (35%)	36.0	.001
Moderate violence	4 (3%)	11 (20%)	3 (6%)	29 (51%)	80.5	.001
Alcohol	7 (5%)	16 (39%)	7 (13%)	13 (23%)24.9	24.9	.001
Knife	135 (90%)	44 (79%)	44 (83%)	32 (56%)	30.7	.001
Blunt	4 (3%)	11 (20%)	5 (9%)	22 (39%)	49.0	.001
Single	60 (40%)	22 (39%)	19 (36%)	22 (39%)	.29	.960
Married	13 (8%)	5 (9%)	5 (9%)	3 (5%)	.84	.840
Offender employed	64 (43%)	32 (57%)	22 (42%)	27 (47%)	3.9	.280
Offender younger than victim	48 (32%)	23 (41%)	30 (57%)	34 (60%)	17.6	.001
Offender older than victim	93 (62%)	31 (55%)	20 (38%)	19 (33%)	18.5	.001
Indoor assault	25 (17%)	8 (14%)	31 (59%)	88 (28%)	44.9	.001
Outdoor assault	89 (59%)	36 (64%)	14 (26%)	22 (39%)	24.4	.001

Victim male	16 (11%)	1 (2%)	6 (11%)	5 (9%)	4.4	.210
Victim prostitute	15 (10%)	4 (7%)	1 (2%)	1 (2%)	6.9	.071
Victim drug or alcohol use	19 (13%)	10 (18%)	0 (0%)	6 (11%)	9.6	.021
Degrading sex behaviours	47 (31%)	8 (14%)	22 (42%)	23 (40%)	12.1	.001
Sexual dysfunction	8 (5%)	3 (5%)	12 (23%)	8 (14%)	15.6	.001
Surprise attack	61 (41%)	19 (34%)	40 (76%)	21 (37%)	25.3	.001
Confidence attack	86 (57%)	34 (61%)	11 (21%)	35 (61%)	26.2	.001
Burglary aspect	7 (4.7)	1 (2%)	31 (59%)	10 (18%)	96.4	.001
Theft aspect	47 (31%)	9 (16%)	33 (62%)	22 (29%)	27.3	.001
Any head injury	20 (13%)	34 (61%)	13 (25%)	40 (70%)	81.9	.001
Two face/head injury	3 (2%)	28 (50%)	2 (3.8)	29 (51%)	106.0	.001
Forensic precautions	29 (19%)	2 (4%)	20 (38%)	5 (9%)	25.6	.001
Two or more precautions	42 (28%)	11 (20%)	26 (49%)	11 (19%	15.5	.001
Any restraint	11 (7.3)	0 (0%)	11 (21%)	1 (2%)	21.2	.001
Average offender age	28	27	26	27	1.7	.141
Average victim age	23	25	37	33	19.3	.001

To illustrate, the criminal control group were most likely to use a knife, bring a weapon to the crime, be older than the victim, whilst also having the youngest mean victim age of the four groups and being most likely to not cause injury. Offenders in the destructive weapons theme were significantly more likely to conduct their attack outdoors, take fewer forensic precautions and were the most likely group to attack a victim under the influence of drugs or alcohol. Offenders in the criminal opportunity theme were significantly more likely to attack indoors, use a surprise attack, take forensic precautions, use more than two precautions, commit a sexual offence that included a burglary or theft aspect, find the weapon at the crime scene and select victims who, compared to the other offender groups, had the highest mean age. Offenders in the destructive violence theme were significantly more likely to be younger than the victim, use violence not upon resistance, inflict moderate injury and to the head/face.

Discussion

Weapon use has been identified as a key concern for policy makers, police forces and researchers, however, until now, it has not been the sole focus of psychological study. Previous research by the authors (Dawson & Goodwill, 2013) suggested that levels of violence and evidence of planning could provide value in the examination of sexual violence. The results are broadly supportive of our hypothesis of a 2x2 model of sexual violence differentiated by levels of aggression and evidence of planning. It is accepted that the themes proposed are not definitive, but warrant further investigation.

A) **Destructive weapons** (*expressive violence/ high planning)*

This offence type represented both a willingness to use expressive violence and engage in planning. A total of 18% of the sample was identified as this type. Behaviours included the use of a firearm, more than one weapon, overt threats of violence, use of a confidence approach (i.e., such as offering help to the victim as a ruse prior to the attack), minimal injury and violence upon victim resistance. These offenders were significantly more likely to attack outdoors. Offenders in this theme had the highest levels of employment, although this did not reach significance. Offenders in this theme were significantly less likely to use precautions during the offence, this could be an aspect of the confidence approach (i.e., as the use of a confidence approach required the offender to approach and therefore be visible to the victim). Alternatively, the higher levels of victims under the influence of alcohol/drugs, or the firearm itself, could have negated the need for precautions.

These appear to be offenders with the foresight to bring and use potentially highly damaging (i.e., a firearm) or multiple weapons, but as stated, predominantly inflict minimal injury upon the victim, a finding consistent with Kleck and McElrath's (1991) finding relating to firearms and injury. This theme also shares similarities with the power assertive rapist (Hazelwood & Burgess, 1987), presenting a macho image (demonstrated here by the firearm and having more than one weapon) whereby violence is used to control the victim often within a confidence approach. In terms of the MTC:R3 (Prenkty & Knight, 1991) there is no clear type this group falls within (e.g., it is neither sadistic, opportunistic or vindictive) - although would likely be comparable to the 'Sexually motivated, non-sadistic' group.

B) **Destructive violence** *(expressive violence/ low planning)*

Key behaviours in this theme included multiple head/face wounds, violence used not upon victim resistance, violence throughout the offence and higher levels of injury as compared to the other three themes. The weapon use and subsequent violence is excessive and not necessary to complete the crime, comparable to previous findings on expressive violence and anger (Groth & Birnbaum, 1979; Salfati & Taylor, 2006). Impulsive crime scene behaviours, demonstrating a lack of planning such as the use of a blunt weapon and alcohol, were part of the theme (in accordance with Beauregard *et al.,* 2007). This also somewhat mirrors both the 'Pervasively Angry' and 'Vindictive' subtypes within the MT3:R3 (Prenkty & Knight, 1991) in which the offender is largely motivated by anger. The offender was significantly more likely to be younger than the victim in the offence. A total of 18% of the sample were identified as demonstrating the destructive violence theme.

C) **Criminal control** *(instrumental violence/ high planning)*

Key behaviours included the use of a vehicle, a familiar crime location, an abduction element to the offence, and a lack of injury to the victim. The behaviours of ‘two or more precautions’ and ‘protecting their identify’ also bordered this theme. This group was also the most likely to target a prostitute as a victim, although this did not reach significance. The victim age was significantly younger than all other subgroups and, as a result, the offenders within this theme were more likely to be older than the victim. With regards to the weapon, these offenders were more likely to bring a knife to the scene but only display it to the victim. This seems to indicate criminal experience and the desire for control; the weapon appears to facilitate the offence. In terms of the MTC:R3 (Prenkty & Knight, 1991) such a grouping would likely fall within the

'Sexually motivated, non-sadistic' offender type given the lack of opportunism, anger or vindictiveness. The majority (47%) of the sample were identified within this type.

D) **Criminal opportunity** *(instrumental/low planning)*

This theme initially appeared improbable, including contradictory behaviours indicating an instrumental aspect (restraints, forensic precautions) alongside low planning behaviours (the weapon found by the offender and a surprise attack). However, other key elements were the indoor location, theft during the offence, a burglary element and a verbal theme regarding their own safety (i.e., telling the victim not to contact police). This is comparable to Salfati (2000) whom reported that obtaining a weapon from the crime scene was an instrumental act. One interpretation of such a behavioural theme is that these offenders are experienced criminals and have taken the opportunity during another crime to sexually offend, but are sentient and able to acquire a weapon. The mean victim age for this theme was significantly older than the other themes, potentially demonstrating the need to acquire a weapon prior to attacks on less vulnerable victims (Beauregard & Leclerc, 2007; Pino & Meir, 1999). The weapon appears not to hold any more importance other than to facilitate the sexual offence. This theme also includes a strong sexual element, which may be indicative of the opportunistic aspect indicating a strong sexual desire within the offence. This type is entirely consistent with the MTC:R3, which outlines opportunism as one of the primary motivations for rape and has two types of opportunistic rapist (differentiated in terms of social competence) (Prenkty & Knight, 1991). A total of 17% of offenders were classified within this type.

A new conceptualisation: violence and evidence of planning

The proposed conceptualisation of violence and evidence of planning goes beyond the current literature on what is known about weapon-enabled offending. Our findings highlight the complexity of weapon-enabled crime, a weapon can be brought or found at the crime scene, physically used to harm or only to threaten, and different weapon types appear to reflect diverse goals that an offender aims to accomplish during the offence. Previous research has not been able to capture such subtleties of weapon use, something that in itself is of value in enhancing our knowledge of such crime. There are also implications from the current study for a variety of other topics.

As previously discussed, many previous studies have discussed concepts such as violence and evidence of planning within criminal behaviour (e.g., Canter *et al.,* 2003; Cornell, Warren, Hawk, Stafford, Oram & Pine, 1996; Ressler *et al.,* 1986; Salfati & Taylor, 2006). The current project adds further evidence that such latent themes can be statistically measured through crime scene behaviour. Going further, it could be argued that the current conceptualisation of weapon enabled sexual crime may prove valuable as a model of other sexual and violent crimes providing a framework from which to conduct further work on a range of different samples.

There are also implications for the psychological assessment and treatment of weapon-enabled offenders. It may be that the different types of behavioural themes present unique psychological needs to be addressed within a therapeutic milieu. Offenders within a *destructive violence* theme may present anger management needs or individuals in the *criminal opportunity* theme present impulsivity needs. Such examples are for illustrative purposes and not comprehensive – the issue being highlighted is the

possibility that different types of weapon-enabled offenders may present unique therapeutic treatment needs. A range of psychological research has explored attachment style and offenders (Marsa, O'Reilly, Carr, Murphy, O'Sullivan, Cotter & Hevey, 2004); pornography and crime (Langevin & Curnoe, 2004); childhood victimisation and empathy (Simons, Wurtele & Heil, 2002); deviant fantasy (Maniglo, 2010); psychopathy (Cornell *et al.,* 1996; Skovran, Huss & Scalora, 2010) and criminogenic needs (Ward & Stewart, 2003). Sadism within sexual offending has been explored by many researchers (Langevin & Curnoe, 2013; Stone, 2010; Proulx, Beauregard, Lussier & Leclerc, 2014). Indeed, the MTC:R3 includes two types of sadistic rapist (Overt and Muted). The current research found no compelling evidence of sadism within the sample. This could be due to limitations of the data (e.g., no information on deviant fantasy, ritualistic behaviours or personality disorders) or the sample itself, that is sexual offenders as opposed to sexual murderers (Salfati & Taylor, 2006). Future research on such topics would benefit from the inclusion of the weapon to explore potential psychological traits. For example, would a highly violent group (e.g., the destructive violence theme) be attracted to violent non-consensual pornography or fantasy? Such research would be of value as little is known about the psychological implications of wielding a weapon or weapon choice.

For the police, the conceptualisation allows an insight into weapon use during an offence and the associations with individual characteristics. Each of the four themes presented different crime scene behaviours, valuable for investigations in understanding the psychology behind the weapon use. A practical implication for the police based on the findings from the current study is the need to record accurate details in victim statements or other crime reports in terms of the weapon and how it is used within an

offence. This will allow police analysts to conduct additional analysis on weapon use so to develop information to inform strategic documents or tactical operations. Such analysis is also compatible with the recent drive towards evidence-based policing (Dawson & Stanko, 2013).

The current research also holds relevance to offender profiling, a somewhat controversial concept that has yielded mixed results in attempting to predict offender characteristics from crime scene information (Mokros & Alison 2002, Goodwill & Alison, 2007; Snook *et al.,* 2008). One finding of substantial importance is that there were no significant demographic differences between the four groupings, and given the different crime scene behaviours and weapon types within each, according to the homology assumption we should see differences (Alison, Bennell, Mokros & Ormerod, 2002). That we do not is a challenge to the assumption if it is framed in terms of a predicted relationship between *demographic* characteristics and crime scene behaviour. Investigations into the relationships between weapon related behaviours and psychological characteristics might be a more fruitful direction (Woodhams, 2012).

Limitations

The current study investigated stranger, single offender/victim offences suggesting that the current findings may not be representative of all sexual offences. It is accepted that rape and sexual assault are underreported (Myhill & Allen, 2002) and, as such, the sample of serious sexual offenders may also be affected by reporting bias. Questions have been raised as to the reliability of data on ViCLAS systems (Snook, Bennell, Taylor, House, MacDonald & Luther, 2012). It is important to note with regards to this that the SCAS incorporates extensive quality assurance procedures for

the coding of their ViCLAS system and they provide training for their staff specific to this. The MDS technique using Jaccard coefficients has been extensively used within the psychological literature for a number of years however it has received criticism for the low likelihood of supporting a null hypothesis and the risks of drawing out conceptual importance from high frequency variables (Taylor *et al.,* 2012). However, critics do maintain that the technique can still provide insights in terms of behavioural subgroups (Taylor *et al.,* 2012). The current work used a theoretical starting point alongside the 'centre of gravity' analysis to bring more rigour to the MDS technique.

Conclusions

The subtleties and psychological implications of weapon-enabled crime have not been explored adequately in the previous literature. The results of this empirical study have sought to present violence and evidence of planning as the basis for a conceptual framework for weapon-enabled sexual offences. Four broad behavioural themes were identified, each demonstrating different crime scene behaviours from which different goals and roles of the weapon were inferred. The present study is far from comprehensive; but it suggests a new conceptualisation of weapon use to lay important groundwork to enhance our understanding of the topic and promote further research on the issue of weapon use, which may hold relevance in the understanding of other non-sexual and violent crimes.

CHAPTER 5

PREDICTING ESCALATION OF VIOLENCE AND BEHAVIOURAL CONSISTENCY OF WEAPONS WITHIN SERIAL SEXUAL OFFENDERS

Chapter rationale

Previous chapters (Chapters 2, 3 and 4) have subject the homology assumption, underlying offender profiling, to the test with respect to weapon related behaviours in sexual offending. Chapter 5 changes focus to the second main assumption of offender profiling, the consistency assumption, again with the weapon being the specific focus of analysis. One of the core questions of the chapter was whether a weapon can provide investigative or other practitioners applied insights around consistency.

A new serial sample of sexual offenders was obtained from the SCAS. Two areas were explored within the chapter; (1) the consistency of the weapon (and of weapon related behaviours) and (2) the escalation of weapon related violence. It has been suggested previously that serial sexual offenders show a degree of consistency in their offending behaviour (Bennell, Gauthier, Gauthier, Melnyk, & Musolino, 2010; Mokros & Alison, 2002; Winter *et al*., 2013; Woodhams & Labuschagne, 2012); however, such research has not considered consistency in weapon related behaviours specifically. In regards of escalation of violence, again there is inadequate research as to the value of the weapon. Both areas can be viewed as significant gaps in the literature, in particular the unanswered questions as to whether the weapon can contribute (or not) to such discussions. Some previous research suggests this may be the case, for example, Warren, Reboussin, Hazelwood, Gibbs, Trumbetta and Cummings (1999) demonstrated that by examining an offender's first serial sexual

offence it was possible to identify those that would continue to escalate. However, this was only in terms of their perceived use of blunt force, as opposed to other weapon related violence. This chapter aimed to assess the investigative benefit of focusing upon weapons within serial sexual offending with regard to policing objectives around crime linkage, assessing risk and dangerousness, and subsequent resource allocation.

Abstract

Issues such as effective behavioural crime linkage and predicting the escalation of violence within series have generated considerable research and are of immense practical importance to investigations. I have previously argued that weapons have not been incorporated adequately into the analysis of offending and such topics could benefit from inclusion of more detailed weapon aspects. The chapter focused on a sample of 155 serial sexual offenders recorded by the Serious Crime Analysis Section (SCAS) of the National Crime Agency and also drew upon a sample of 316 'one-off' weapon-enabled sexual offenders. In terms of escalation, approximately one-third (53 out of 155, 34%) were identified as increasing in violence within their series of offences. There were no demographic differences between increasers and non-increasers, although increasers' series spanned a longer period of time, on average. A multivariate model identified being unemployed and using a surprise attack during/at the time of the first offence as significant predictors of increaser status. Just over half of serial offenders had at least one offence in their series that was weapon-enabled. Regarding consistency, for one-third of these offenders, every offence in their series was weapon enabled, with the majority being consistent in the use of knives. Very few offenders used more than one weapon type within their series. Additionally, the serial and one-off samples were used to generate different groups of crime pairs (serial-linked; serial-unlinked; oneoff-oneoff unlinked; serial-oneoff unlinked) to assess consistency and distinctiveness in weapon related behaviours. The linked pairs (those committed by the same offender) were significantly more similar (with a larger effect size) in weapon related behaviours than all types of unlinked pairs. Results and practical limitations are discussed.

Introduction

The linking of crimes

Behavioural crime linkage, also known as comparative case analysis or crime linkage analysis, is used by many police agencies to link crime series together based upon behavioural similarity and other characteristics to benefit investigations (Woodhams, Hollin & Bull, 2007). It rests on the theoretical assumptions of behavioural consistency and inter-individual variation (Alison *et al*., 2002; Canter, 1995, 2000). Consistency refers to the assumption that an offender's behaviour is consistent across a crime series. Inter-individual variation would suppose that the crime scene behaviour of one offender is able to be differentiated from that of other offenders. In simple terms, if offenders do not display a degree of consistency across a series of crimes, it would be very difficult to link crimes and also make other accurate predictions as to offender characteristics from behaviour.

There have been demonstrations of a degree of behavioural consistency and distinctiveness within a variety of crime types: for example, burglary (Goodwill & Alison, 2006; Tonkin, Santtila & Bull, 2011); robbery (Burrell, Bull & Bond, 2012), serial murder (Santtila *et al.,* 2008; Salo, Sirén, Corander, Zappalà, Bosco, Mokros, & Santtila, 2012), arson (Santtila, Fritzon, & Tamelander, 2004). Much of the research of behavioural crime linkage has explored and consistency and distinctiveness across the crime scene behaviours of serial sexual offenders (Canter, 1995; Grubin, Kelly, & Ayis, 1997; Grubin *et al.,* 2001; Lundrigan, Czarnomski & Wilson, 2010; Santtila, Junkkila, & Sandnabba, 2005; Winter, Lemeire, Meganck, Geboers, Rossi, & Mokros, 2013; Woodhams & Labuschagne, 2012; Yokota *et al.*, 2007).

In terms of consistency, Knight *et al.,* (1998) reported that the use of a 'firearm', 'cutting/slashing clothing', 'excessive response to victim resistance' and the victim being 'bound' were crime scene behaviours with the highest levels of consistency within a series. Further evidence would suggest that sexual offenders demonstrate some consistency within victim selection (Guay, Proulx, Cusson & Ouimet, 2001; Soothill *et al*., 2000). Overall, there is a compelling case for the assumption that serial sexual offenders behave with a degree of consistency across their series.

Bennell, Mugford, Ellingwood, and Woodhams (2013) provide a recent review of the behavioural crime linkage research across a range of crime types (including a total of 19 published studies) noting the unstandardised approach taken in assessing consistency, highlighting Receiver Operating Characteristic (ROC) analysis and the calculation of the Area Under the Curve (AUC) as a means of enabling more rigorous comparisons across studies. It is common in behavioural crime linkage studies for the Jaccard's coeffiicent to be used to measure the similarity in behaviour between two incidents or crime pairs - with the resulting value ranging between 0 (no similarity) to 1 (perfect similarity). Linked crime pairs are expected to have larger Jaccard's coefficients than unlinked pairs. ROC analysis is then used to plot the probability of a hit versus a false alarm at each decision threshold (representing the various Jaccard's coefficients in the sample). The overall accuracy of differentiating linked from unlinked pairs is assessed using the AUC statistic (see Bennell *et al.*, 2009). If linked crimes can be differentiated from unlinked crimes accurately, such analysis would result in a high ROC curve and therefore a large AUC. To date, several studies of serial sexual assault report linked crimes to be more similar than unlinked crimes, with significantly larger Jaccard's coefficients, and moderate/excellent levels of predictive accuracy (AUCs

between 0.7 to 0.9) (Bennell, Gauthier, Gauthier, Melnyk, & Musolino, 2010; Mokros & Alison, 2002; Winter *et al*., 2013; Woodhams & Labuschagne, 2012).

Woodhams and Labuschagne (2012) propose that behavioural crime linking will not be an 'exact science' given that both stability and evolution have been reported within the crime scene behaviour of serial sexual offenders. Indeed, an added potent factor in the ability to link crimes accurately would be the range of individual differences explored and how these contribute to or moderate the offence itself, for example, the offender's learning experiences, the role of fantasy in rape, sexual interests, use of alcohol, power, pseudo-intimacy, use of pornography, victim resistance and so on (Barbaree & Marshall, 1991; Beauregard, Lussier and Proulx, 2010). These could produce "noise" in the data making clear predictions difficult (Ouimet, Guay & Proulx, 2000; Sorochinski & Salfati, 2010; Woodhams *et al*., 2007). Nonetheless, Bennell *et al.* (2013) note the increasing research into the consistency of crime scene behaviour and the growing ability, thanks to the increasing adoption of ROC analysis by researchers, to compare and contrast levels of discrimination accuracy across studies.

Within series escalation of violence

Since the late 1980's, the prediction of violence or violence risk assessment has been the subject to considerable clinical and academic interest (Fazel, Singh, Doll, & Grann, 2012). Such risk assessments have also been developed for the criminal justice system in terms of predicting general (Howard, Francis, Soothill & Humphreys, 2009), sexual (Thornton, 2007) and violent reoffending (Howard & Dixon, 2012). Such

instruments play a key role in public protection, assessing and managing offenders - yet are of less value from an investigative perspective.

In a similar vein, much of the academic exploration of criminality and escalation has tended to focus on what can be learned exploring overall criminal careers, offence types and their development (Armstrong & Britt, 2004; Britt, 1996). To illustrate, individuals with a prior conviction for kidnap, arson or blackmail are far more likely to escalate to murder at a later stage of their criminal career (Soothill *et al*., 2002; Soothill, Francis & Liu, 2008). Likewise, offenders whom committed robbery, burglary or vehicle theft as their debut offence are far more likely to become chronic or lifetime offenders (Home Office, 2013). Other general criminal career research demonstrates the consistent finding that an early age of criminal onset (typically between the ages of 8-14 years) indicates both a future of more serious offending as well as a longer criminal career (Eklund & Klinteberg, 2006; Farrington, 1997). Such research is valuable from a theoretical perspective, but again, is of less practical use for active investigations.

A key paper in terms of escalation within the series of sexual offenders was that of Warren, Reboussin, Hazelwood, Gibbs, Trumbetta and Cummings (1999). This study attempted to determine which information provided to the police by the victim could be useful in determining, early in a series of rapes, the offenders most likely to escalate in the use of violence within their series of crimes. Warren *et al.,* (1999) examined 41 serial rapists (responsible for 837 rapes) to see whether behaviours *in the first offence* were able to predict a future escalation of violence. In total, one-quarter (25%) of offenders showed an increase in blunt force over their crime series. Logistic

regression indicated rapists that were White, used profanities and raped for longer periods of time in their first offence, were more likely to escalate in the use of blunt force over time. Other variables that approached significance included targeting victims over the age of 40, inflicting less injury during their first offence and more frequent foreign object penetration.

This concept of some sexual offenders being "increasers" and the ability to identify them has been studied by other researchers using a variety of techniques. Grubin and Gunn (1990) examined serial and one-off rapists, reporting that increasers were generally younger (i.e., a mean age of 23 years as compared to 29 years) and were more likely to ejaculate prematurely during the offense as compared to non-increasers. Grubin and Gunn also stated that *''more gratuitous violence tended to be present in the non-increasing group''* (p. 85).

Hazelwood *et al*., (1989) focused on the consistency and change in behaviour manifest by rapists during their *first* and *last* offenses. The results indicated that only a minority of rapists became more violent over their series - only 10 were defined as increasers whilst 29 were defined as non-increasers. When the non-increasers and increasers were compared, no differences were found on a range of variables (including age at first and last assaults, race, marital status, education, the offender's relationship with the victim, sexual abuse of the offender as a child). The increasers did, however, assault more victims (a mean of 40 offences as contrasted with 22 for non-increasers), assault more frequently and tended to inflict their most serious injury during their last offence.

Research has also examined the temporal nature of offending pertaining to escalation. Liu, Francis and Soothill (2011) through the use of multi-level modelling reported that individuals with many convictions within a short time period were more likely to escalate (e.g., offenders younger than 18 with more than five convictions a year, or offenders aged 18 or older with more than two convictions a year).

Examining 72 serial sex offenders, Hewitt and Beauregard (2013) categorised rapists as either stable, escalators or de-escalators. The majority of the sample were considered to be consistent in both their sexually intrusive behaviours and their levels of physical force used within the crime across their series. The authors report that victim resistance and in which crime in the series the offender experienced such resistance impacted upon escalation of violence. To illustrate, if the first victim resisted, the offender was more likely to de-escalate; whereas if the second victim resisted, the offender was less likely to de-escalate. In discussing their results, Hewitt and Beauregard (2013) raise issues such as fantasy, location of offence, use of substances, sexual gratification and victim targeting as contextual issues that could influence escalation. Such reflections sit comfortably within the broader discussion around the potential impact of such situational or contextual issues on crime scene behaviour (Carabellese, Maniglio, Greco, & Catanesi, 2011; Gee, Devilly & Ward, 2004; Taylor, Bennell, & Snook, 2002).

Overall, the majority of research into escalation has focussed its attention on offence types as opposed to within series behaviours to predict escalation. There is no doubt that the ability to predict which serial offenders may escalate in violence over their remaining series would be of great importance to investigations, and as such it is a

positive that the majority of research conducted on this topic have identified a group that do increase over their crime series. However, further research is required to continue to drive this forward and fine-tune the learning.

Can weapon related behaviours add value to exploring consistency and escalation of violence?

In this thesis I have argued that the concept of incorporating weapons, along with all the relevant subtleties (e.g., displayed, threatened, used and so on) into the analysis of crime can add value (Dawson & Goodwill, 2013). In addition, it is also an issue that has not been sufficiently explored in the analysis of behavioural crime linkage or in studies of escalation in crime scene behaviour. The aim of the current paper was to conduct novel analysis relating to escalation and consistency of serial sexual offenders, but with a specific focus on weapon related aspects.

There is limited research on which to develop firm hypotheses. Some authors would postulate that the very presence of a weapon would lead people to behave more aggressively (e.g., the *'weapons effect'*, Berkowitz & Lepage, 1967, or the '*weapon instrumentality hypothesis'*, Phillips & Maume, 2007). Elsewhere, there is mixed research as to whether the presence of weapons increases or not the levels of injury sustained by a victim (Kleck & McElrath, 1991; Wells & Horney, 2002). Examining over 1618 serious sexual offenders (of which 316 were weapon enabled), the authors previously demonstrated that weapon enabled sexual offenders were more likely to cause injury to the victim during the offence and displayed more evidence of planning (e.g., taking more precautions, false imprisonment/abduction, offences more likely to have a duration of contact between offender and victim of less than one hour) (See

Chapter 2). Similarly, broader evidence has highlighted weapon enabled sex offenders to be a complex group, for example, showing more violence in their career, psychoses, sadism, alcoholism, drug addiction and personality disorder (Langevin & Curnoe, 2013). However, little research has specifically sought to examine consistency or distinctiveness of weapon related behaviours.

The current paper aimed to add value to the research of consistency, distinctiveness and escalation, but specifically through the lens of weapon-enabled offenders to seek to derive any added benefit from this crime scene behaviour. Whilst it could be argued that exploring both consistency *and* escalation is contradictory, as yet, not enough is known regarding weapon-enabled behaviours and, as such, this was exploratory research aimed to enhance the evidence base and attempt to derive investigative insights.

I have previously argued that weapon related behaviours are not only another crime scene behaviour and proposed that such behaviours have the potential to represent many different underlying themes. To illustrate, the first author (Dawson & Goodwill, 2013) has previously outlined a range of themes that potentially influence the use of a weapon (e.g., power, anger, control, organisation, disorganisation) - although their impact on consistency or escalation is unknown.

The aim in this chapter was to generate findings that could have practical benefits for police forces and investigations around issues of behavioural crime linkage and predicting escalation. Both are highly valuable practical concepts, which if conducted accurately, could assist investigations - in terms of suspect prioritisation,

effective investigation, risk and harm reduction and resourcing decisions (Grubin, Kelly & Brunsdon, 2001). Whilst empirical research has explored consistency, distinctiveness and escalation within serial sexual offenders, weapon related aspects have not been given specific attention; rather such behaviours would be subsumed within a general modus operandi category. Little is therefore known about their specific value in predicting series membership or escalation. In particular, the aims of the current chapter were:

Aims

1. Can those offenders that increase in the use of violence later in their offence series based upon aspects of the first known offence be identified?

2. To explore levels of consistency and distinctiveness within weapon and weapon related behaviours.

Method

Sample

The overall sample consisted of 155 serial sexual offenders with a total of 545 solved offences (at an average of 3.5 per series, with a range between 2 - 13 offences in the series) recorded by the Serious Crime Analysis Section (SCAS) of the National Crime Agency. SCAS is an analytical unit with national responsibility to carry out analytical work on behalf of all police forces. SCAS collates and analyzes information on serious crimes that fulfill its criteria, predominately stranger murders, and serious sexual assaults and/or rapes. Specifically the data were captured on the Violence Crime Linkage Analysis System (ViCLAS[13]). The focus was on lone (e.g., single) victim and a lone (e.g., single) offender. There were no duplicate cases. All cases held by SCAS that met these criteria were provided for analysis. All offences took place in the United Kingdom. The majority of cases had start dates of either the 1990's (*n*=212, 39%) or the 2000s (*n*= 270, 50%). To illustrate, there was only one case in the 1960's, 11 in the 1970's and 51 in the 1980s.

All offenders were male. Ages were available for all offenders: the mean age at first offence was 29 years (with a range between 13 to 55, *SD*=9.4). The majority of offenders were White European (*n*=122, 79%), and one-third were single at the time of the first known offence (*n*=42, 27%) with a lesser number married (*n*=25, 16%)[14]. Just over half reported having a job at the time of the first offence (*n*=88, 57%)[15]. The majority of victims were female (n=143, 92%) with only a minority male (n=12, 8%).

[13]For more information of the ViCLAS data and variables - see the Royal Canadian Mounted Police http://www.rcmp-grc.gc.ca/tops-opst/bs-sc/viclas-salvac-eng.htm.
[14] The majority *(n*=70, 45%) had a relationship status of unknown at first offence.
[15] The presence of such a variable is sometimes difficult to ascertain and as such will not always be reliable.

The paper also made use of a sample of 316 'one-off' weapon-enabled lone (single) offender – lone (single) victim sexual offenders, drawn from a larger sample of 1618 sexual offenders provided by the SCAS. The reasons for inclusion of this comparison sample are outlined in more detail below. For more information on this data set, see Dawson, Goodwill and Dixon (2014).

Procedure

Data were anonymized and provided to the authors in the form of a Microsoft Excel spreadsheet including variables that described the basic demographics of the victim and offender (e.g., age, gender, relationship, employment), weapon use, offence behaviours, location of offence, additional aspects (e.g., robbery or burglary), victim participation, levels of victim injury, precautions used by the offender during the offence and some aspects of criminal history (e.g., history of prison, frequent criminal variable). Whilst it was not possible to conduct inter-rater reliability assessments, data were quality assessed by SCAS before it was sent to the researchers, and a team of highly trained individuals (Assistant Crime Analysts) working within a controlled environment completes all data inputted into the SCAS database. Furthermore, a 'quality control guide' is utilized by the Assistant Crime Analysts inputting data into the database to ensure consistency in decision-making.

Groups of less frequent variables were collapsed into single variables in thematically similar cases. To illustrate, an 'any confidence approach' was derived from a total of 17 different individual types of confidence approach, and an 'any surprise approach', from a total of seven different surprise types. Similarly, an 'any precaution variable' was created (which comprised of a total of 22 variables) and a 'degrading sex

variable' was coded that merged 'object insertion', 'anal sex', and 'ejaculating on the victim'.

The current paper only utilised weapon related and violence behaviours from this larger dataset. These were the variables of the type of weapon, how the weapon was used (threatened, only displayed, physically used); injury levels (minimal, moderate, severe, extreme), and whether the violence was used 'upon resistance' or 'not only upon resistance'. A small number of new variables were developed from the data to examine the more extreme cases, such as the offender presenting 'more than one weapon' during the crime. All of these variables were coded in a binary manner with "1" indicating presence of the behaviour and "0" the absence of a behaviour.

Having coded the offence behaviours, each serial offender was categorised as an increaser or non-increaser. Previous increaser research typically collates groups of crime scene behaviours and sums these together to create a scale to measure any 'increase'. For example, Warren *et al.,* (1999) created a 5 point scale including (no force, victim struck to intimidate, victim stuck painfully, victim beaten, victim severely beaten or killed). Such coding was limited as it was both subjective (e.g., painful strike) and only examines blunt injury. A similar broad approach was adopted, but in terms of identifying the increasers, the variables of 'weapon use' and 'levels of injury' were scored in such a way that when summed, would provide a proxy of overall violence. Weapon use was coded: as 0 = no weapon, 1 = weapon threat/displayed, 2 = weapon used. The injury variable was coded as 0 = no injury, 1 = minimal injury, 2 = moderate injury, 3 = severe/extreme injury. Each crime in an offender's series was summed in this way, resulting in a score between zero and a maximum of five for each crime.

Increasers were those serial offenders who showed any increase in this score subsequent to their first known offence in the series. Hence in the case where offence two in the series contained more violence than the first, and the remaining offences were lower in violence, this offender would still be an increaser. This decision was taken given the elevated risks of *any* increase in violent behaviour and the need for prioritisation within such cases. These groups were then subject to chi-square analysis, Mann-Whitney U tests and logistic regression.

To examine consistency and distinctiveness of weapon related behaviours, pairs of crimes were created in an approach first outlined by Bennell in 1999. Such an approach involves creating a subset of 'linked crime pairs' (that is offences conducted by the same offender) and a subset of 'unlinked crime pairs' (that is pairs of crimes committed by different offenders) and then generating a measure of behavioural similarity for each pair - Jaccards' coefficient. This approach has been used frequently to test assumptions of behavioural case linkage with the rationale being that linked crime pairs (committed by the same offender) should have larger coefficients that unlinked pairs (see Bennell & Canter 2002; Woodhams & Toye 2007). Given the analysis was seeking to explore the consistency of weapon-enabled behaviours, only those crimes in an offender's series that were weapon enabled were incorporated for this analytical aspect. This resulted in a total number of 137 weapon enabled linked crime pairs, and 7123 unlinked pairs created from the serial dataset (called unlinked serial pairs). Additionally, the sample of 316 weapon enabled lone offender-lone victim 'one off' offences were incorporated into the analysis resulting in a group of serial-one off unlinked pairs (n=37728) and one off-one off unlinked pairs (n=50278) being generated. The weapon related behaviours included in this analysis were type of

weapon (knife, blunt, firearm), level of injury (minimal, moderate, extreme/severe), how the weapon was used (threat, display or used) and if violence was used upon resistance or not.

Leave-one-out logistic regression and ROC analyses were conducted. Cross-validation is a widely used approach to evaluate modeling methodologies. The leave-one-out cross validation was used (Herrmann, 1998). This process involves taking each case out of the dataset one at a time and then developing a logistic regression model on the remaining dataset which is then applied to the extracted case to produce a predicted probability. This process is repeated for every case in the original dataset. The predicted probabilities subsequently form the input data to enable ROC analysis (Woodhams & Labuschagne, 2012) to assess how accurately linked crime pairs can be distinguished from unlinked crime pairs.

Results

1) Can we identify those offenders that increase in the use of violence later in their offence series based upon aspects of the first known offence?

As previously described, each offence in the series was scored for violence with a higher score equating with greater violence. Approximately, one-third of offences scored either zero (*n*=53, 34%) or one (*n*=52, 33%), with fewer offences receiving scores of two (*n*=26, 17%), three (*n*=15, 10%), four (*n*=4, 3%) and five (*n*=6, 4%). Increasers were defined as those offenders who showed an escalation in this score subsequent to their first crime in the series. Using this approach, of the 155 serial offenders, 53 (34%) were defined as increasers.

Table 1

Significant Differences Between Increasers and Non Increasers

Variable (and description where necessary)	Increasers (*n*=53)		Non-increasers (*n*=102)		X^2	*Bivariate significance (p)*	Phi effect size
	%	*n*	%	*n*			
Attack a female victim	100	53	88	90	6.7	.005	.209
Use a surprise attack	55	29	35	36	4.3	.026	.187
Unemployed	55	29	36	37	4.8	.021	.177
Previous prison sentence	21	11	8	9	4.4	.035	.169
Attack a stranger	80	42	62	64	4.3	.026	.168

The comparison of increasers to non-increasers found no significant differences in terms of the age of the victim (either at the first offence or overall mean age across

the entire series), number of overall offences in the series, offender age, the SCAS defined "frequent criminal[16]" variable, offender relationship status (e.g., single, married), degrading sexual behaviours[17], any precautions used during the offence, SCAS defined "additional aspects to the offence" (e.g., offence included robbery or burglary), victim sexual participation, location of the offence (e.g., inside or outside), use of a vehicle within the offence, the length of contact between victim/offender or previous adult or juvenile conviction of the offender.

However, there were significant differences between those that increased compared to those that did not across their series (see Table 1). The mean number of days between the first and last offence in each offender series was calculated - for increasers (*n*=53, 1213 days, *SD*=1748) and non-increasers (*n*=102, 761 days, *SD*=1796). Mann-Whitney tests indicated that this difference was significant (*U*=1924, *p*=.003). At the time of the first offence, the increasers were significantly more likely to present the variable of unemployment (*n*=29, 55% vs. *n*=37, 36% X^2= 4.8, *p*=.021); use a surprise attack (*n*=29, 55% vs. *n*=36, 35%, X^2=5.4, *p*=.016); attack a stranger victim (*n*=42, 80% vs. *n*=64, 62%, X^2= 4.3, *p*=.026); attack a female victim (*n*=53, 100% vs. *n*=90, 88%, $X^{2=}$6.7, *p*=.005); and having a previous prison sentence in their history (*n*=11, 21% vs. *n*=9, 8%, X^2=4.4, *p*=.035).

Logistic regression analysis was conducted on the five significant variables allowing for a sufficient case to variable ratio (Peduzzi, Concato, Kemper, Holford & Feinstein, 1996). To note, *female victim* was not entered here as it was a constant for all

[16] SCAS data reported a frequent criminal lifestyle for the offender.
[17] A variable that combined 'object insertion', 'anal sex', and 'ejaculating on the victim'.

increasers and almost all non-escalators (100% and 88%). The statistically significant variables within the final model derived through logistic regression are presented in Table 2. While significant overall, the model explained relatively little of the variability in increaser status (Nagelkerke R Square .143; Cox & Snell R .103; p=.002). The significant variables in the model associated with predicting future escalation was the unemployed variable (p=.020) and using a surprise attack (p=.027) at the time of first offence.

Table 2

Significant Factors associated with Predicting Increaser Status

Variable Name	*B*	*p*	*OR*	*95% Lower*	*95% Upper*
Unemployed	.886	.020	2.425	1.152	5.107
Surprise attack	.854	.027	2.350	1.101	5.016
Previous prison sentence	.706	.170	2.025	.739	5.551
Attack stranger	.577	.175	1.781	.773	4.103

2) Explore levels of consistency and distinctiveness within weapon and weapon related behaviours

In terms of basic weapon use, of the 155 serial offenders in the sample, half (n=79, 51%) had at least one offence in their series that was weapon-enabled. In order to examine consistency of weapon type over a series, the focus had to be on those offenders that had *more than one* weapon enabled offence in their series. To demonstrate, just under half of the weapon-enabled offenders (n=34, 43%) only had

one weapon-enabled offence in their series and so could not be examined from a consistency point of view. This in itself demonstrates a level in inconsistency.

In cases where there was *more than one weapon offence in the series* (*n*=45), in almost all cases the same type of weapon was used within the offenders' series (*n*=36, 80%). However, in terms of distinctiveness, these were almost exclusively knives (in 32 out of these 36 cases). The remaining four cases here comprised of offenders that used blunt instruments or firearms exclusively or more than one weapon within their series. Only a minority of the weapon-enabled serial offenders (*n*=9, 20%) used more than one type of weapon within their series. Finally, in terms of basic consistency, just over half of weapon-enabled offenders used a weapon in two or more (offences) in their series, and within these, the majority used a weapon in every offence in their series.

To explore consistency and distinctiveness in more detail, a total of 137 linked crime pairs and 7123 unlinked serial-serial pairs were generated from the serial weapon enabled offenders who had more than one weapon-enabled offence in their series. Additionally, the sample of 316 weapon enabled 'one off' offences were used to generate additional unlinked pairs resulting in 37728 serial-one off unlinked pairs and 50278 one off-one off unlinked pairs. The mean Jaccard's coefficient for the linked crime pairs and the various types of unlinked crime pairs can be seen in Table 3.

Table 3

Group Medians for the Different Offence Pairs

	Median Jaccard's	Range	CI (95%)	
Linked	.50	0 - 1	.53	.64
Serial-Serial Unlinked	.29	0 - 1	.35	.36
One off - One off Unlinked	.25	0 - 1	.33	.34
Serial-One off Unlinked	.29	0 - 1	.34	.35

The Kolmogorov-Smirnov test of normality was significant for each pair type indicating that the distribution of Jaccard's coefficients for each group were not normally distributed. As such, the Kruskal-Wallis test was used to explore the different conditions (Linked; Serial-Serial unlinked; One off-One off unlinked; Serial-One off unlinked). The Kruskal-Wallis test returned a significant result (H=133, df=3, p=.001) indicating there was a statistically significant difference between the four groups in their distribution of Jaccard's coefficients.

Follow-up Mann Whitney U tests were conducted to evaluate the differences amongst the groups. The results of these tests indicated a significant difference between each of the groups (see Table 4). However, large sample sizes can often generate significant results, even when the differences in outcomes are negligible. To investigate further, the effect size *r* was approximated, using the following equation suggested by Pallant (2010, p. 230): $r = z$ / square root of N, where N = total number of cases. Moderate/ very strong effect sizes were observed between the Linked pairs and all the unlinked pair groups (e.g. serial-serial unlinked (.09), one off-one off unlinked (.04), and serial-one off unlinked (.05)). The effect sizes between all other combinations of unlinked offences were very small.

Table 4

Resulting p and r Values for the Comparison of Crime Pair Types

	1.Linked		2.Serial-Serial Unlinked		3.One off-One off Unlinked		4.Serial-One off-Unlinked	
	p	*r*	*p*	*r*	*p*	*r*	*p*	*r*
1.Linked	-	-						
2.Serial-Serial Unlinked	.001	.09	-	-				
3.One off-One off Unlinked	.001	.04	.001	.02	-	-		
4.Serial-One off Unlinked	.001	.05	.004	.01	.001	.02	-	-

Finally, ROC analysis (see Figure 1) was conducted to assess the discrimination accuracy of similarity in weapon related crime behaviours using the predicted probabilities generated by a leave-one-out logistic regression analysis. The resulting AUC of .68 (*SE*=.02, 95% CI=.63 -.72) represented a significant ($p<.001$) level of predictive accuracy but would not be considered of a moderate size (Swets, 1988).

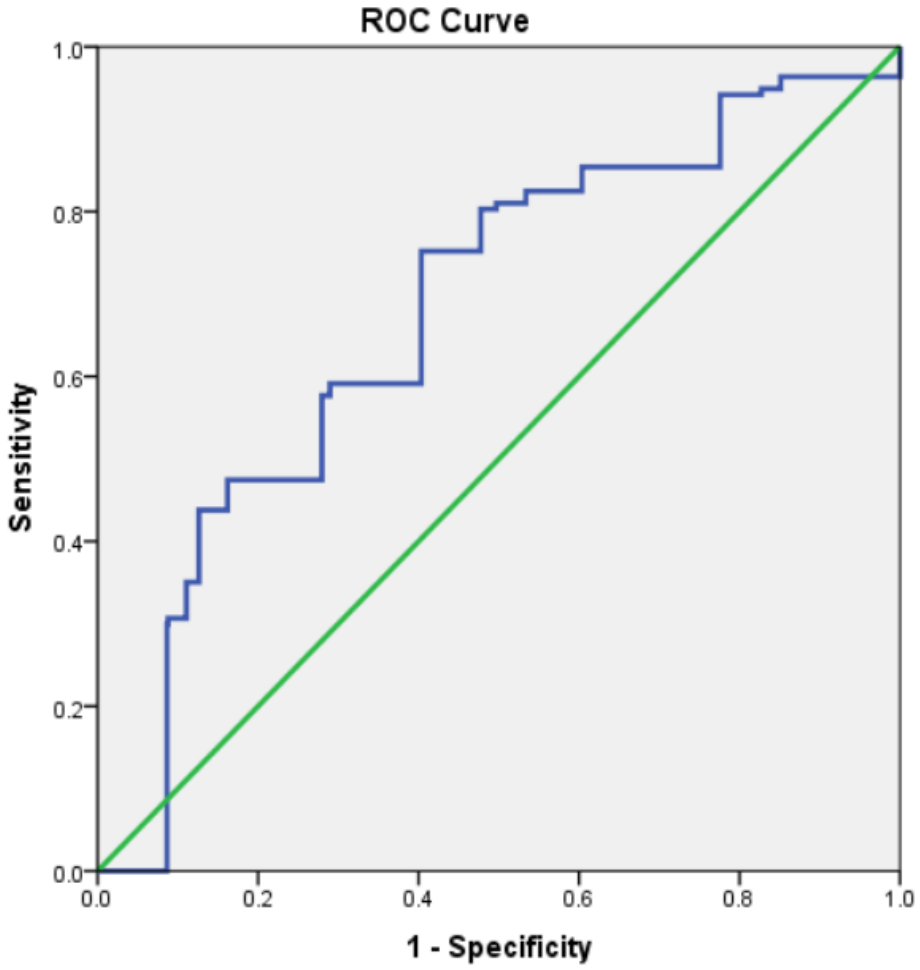


Figure 1

ROC graph for differentiating serial linked and unlinked crime pairs using probabilities from the leave one out logistic regression

Discussion

The existing literature on the consistency of serial sex offending has indicated that while a degree of consistency can be observed, there is considerable variation between offences/offenders. Other previous studies have indicated that some offenders escalate in their violence over time therefore suggesting that there is the potential for behavioural variation over time, rather than consistency. Neither concept has been explored previously with regard to weapon related behaviours. The current paper aimed to examine these issues in detail.

Before discussing the major findings, there are some basic observations that warrant highlighting. In terms of the prevalence of weapon-enabled offending within the crimes of serial sex offenders, the current research indicates that serial offenders are far more likely to be weapon enabled than one-off sexual offenders. In terms of basic weapon use, of the 155 serial offenders in the sample, half (*n*=79, 51%) had at least one offence in their series that was weapon-enabled. Whilst there are official prevalence statistics around weapon use within sexual offending (e.g., Office for National Statistics, 2012), these were not established to collect weapon data, serial compared to single offences and tend to underestimate weapon use. To illustrate, specifically examining weapon enabled lone (i.e., single) sexual offenders, Dawson, Goodwill and Dixon (2014) reported that 20% of one-off sexual offenders were weapon enabled. See also Langevin and Curnoe (2013) who report a similar 25% prevalence. Whilst the samples under comparison here are likely different, none-the-less, there are signs that serial offenders are different than single offenders in terms of weapon use.

Predicting escalation of violence within a series

In terms of behavioural variability, violence escalation within a series was relatively common in the dataset with just over one-third of the serial offenders being defined as increasers. This is similar to the figure (25%) reported by Warren *et al*., (1999) and the 24% (10 increasers out of 41 serial rapists) reported by Hazelwood *et al*., (1989).

The homology assumption of offender profiling (Mokros & Alison, 2002) would predict that offenders with different crime scene behaviour should have different characteristics. Often in the past this has been interpreted as different *demographic* characteristics if it is assumed that demographic characteristics can be predicted from crime scene behaviour (Alison *et al.,* 2002). In contrast to this prediction, there were no differences between increasers and non-increasers in demographic characteristics. However, in other aspects of the offence differences did emerge. The series of those identified as increasers spanned, on average, a significantly longer period of time - that is, from their first to last (known) offence. There was no difference between groups in terms of total number of offences in the series. This demonstrates the additional value in focussing investigate resources on the potential identification of such offenders given their longer careers.

The significant variables in the final model to predict the increaser group were unemployment and using a surprise attack during/at the time of the first offence. This contrasts with the previous research on increasers, whereby a range of factors have been identified, including - a younger offender age, sexual dysfunction, verbal

profanity and longer offence duration (Grubin & Gunn, 1990; Hazelwood *et al.*, 1989; Warren *et al*., 1999).

Much of the increaser research has been conducted with different definitions and techniques. For example, Hazelwood *et al*., (1989) compared violence between the first and last offence to define increasers. Such an approach would assume that increasers would end their series with their most violent offence, something that as we will discuss later is not always the case. Warren *et al*., (1999) focused on blunt force and defined increasers as those offenders that had a positive regression slope between the first and last offence in their series. Warren *et al*., (1999) is the most sophisticated of the previous increaser research, although still heavily limited. It only examined blunt force on a five-point scale - where 1 equaled no force, 2 being struck to intimidate, 3 equaling painful strike, 4 being the victim being beaten and 5 the victim being severely injured. Such coding is limited in as far as it only examines blunt force, and incorporates subjective coding such as a 'painful strike' or a 'strike to intimidate'. Overall, the lack of an agreed definition of increasers could hamper further study within the topic. It is also worth reflecting that the presence of such a variable (e.g., employment) is sometimes difficult to ascertain and will not always be reliable. The current analysis was possible given the retrospective nature of the data - allowing for a charting of first known offence and the remainder of the series. In actual live cases, there would be no easy way to determine of the offence under investigation was a 'first' offence or 'second' and so on. This itself would be a future area of worthy of study, the ability to identify a 'first' time offence.

There has been considerable research that indicates an association between unemployment, crime and violence (Gendreau *et al.,* 1996; Hollin & Palmer, 2006; Ministry of Justice, 2013). A lack of employment has been identified as an important factor in offender recidivism and in this way employment related programmes have demonstrated positive results in reducing reoffending (Lipsey, 1995; Sampson & Laub, 1993). It is also plausible that unemployment at the time of the first offence represents other issues for the offender, such as lifestyle stressors, poor literacy and numeracy skills, frustration, anger and disorganisation (Baker, Jones, Roberts & Merrington, 2002; Knight, Warren, Reboussin & Soley, 1988; Ressler, Burgess, & Douglas, 1988; Salfati & Taylor, 2006) that could potentially account for any future increase of violence. There is no obvious explanation as to why those who adopt a surprise attack in their first offence would go on to escalate in violence. Of note, Dawson, Goodwill and Dixon (2014) report that weapon-enabled sexual offenders were significantly more likely to adopt a surprise attack. Indeed, such a victim approach may also be more likely to encounter victim resistance, thus increasing the opportunity for potential violence (Porter & Alison, 2004).

Even through more than one-third of offenders were identified as increasers, there was no discernable pattern to this escalation. Indeed, the lack of such a steady pattern of violence potentially indicates the offender is reacting to victim behaviours (Fritzon & Garbutt, 2001) as opposed to any specific drives or sadism to inflict harm to the victim (Stone, 2010). To illustrate this variation, there were only two increasers that displayed a slow incremental increase in violence over their series. This can be seen in the case study below.

"Offender A conducted four offences in a one year time period whilst 16 years of age. A weapon (knife) was only used during offence two in the series. Violence was used throughout the series, minimal during offences one and two, moderate in offence three, and severe in offence four. Precautions were only used in offences three and four. Each offence incorporated a surprise approach. Each of the victims were aged between 25 - 30."

However, as demonstrated by the below case study, escalation was not always so incremental, with the majority of offenders being more haphazard in their use and escalation of violence. In the below case study, out of a total of eight offences, a weapon was noted in several in the middle of the series, although not the latter and only used to injure in offence 3.

"Offender B had eight crimes in the series over a five year period, and the blunt weapon was only observed by the victim in crimes 3, 4 and 5 (out of a total of eight). Escalation of violence was seen in offence three, where the weapon was used to injure the victim. In the remaining two weapon enabled crimes in the series the weapon was only displayed and no injury was inflicted. The offender began their series aged 14 and was 19 at the age of the final (eighth) offence. Each of the victims were female with ages ranging from 11-49 years."

Consistency of weapon related behaviours

As highlighted earlier, half of the overall sample (n=79/155) had at least one offence in their series that was weapon-enabled. Of those that had a weapon-enabled offence, less than half (n=34/79) only had one offence in the series that included a

weapon and as a result were excluded from the consistency analysis. In itself, this demonstrates an aspect of inconsistency. Just over half of weapon-enabled offenders (n=45/79) used a weapon in two or more of their series, and within these, the majority used a weapon in every offence in their series (n=31/45). In those cases where the serial offender had more than one weapon enabled offence in their series, almost exclusively the same weapon (a knife) was evident. Very few offenders used more than one weapon type across their series. Even at this level a complex picture emerges, with varying levels of consistency around weapon use, with greater consistency reported once the offender uses the weapon in more than one offence. This provides some evidence for the consistency assumption underpinning crime linkage with respect to weapon related behaviours. However, the dominance of knives in the sample overall, suggested that the assumption of distinctiveness would be more difficult to satisfy.

Linked crime pairs were significantly more similar in weapon related crime behaviours, with large effect sizes, than crime pairs composed of the crimes of two different serial offenders, two one-off offenders, or a mix of the two. That is to say, serial offenders showed more behavioural consistency in terms of weapon-enabled crime behaviours. The incorporation of one-off offenders into the analysis to create additional unlinked crime pairs was a methodological improvement on many other crime linkage studies with serial sex offenders, increasing ecological validity. As indicated, the linked crime pairs were still significantly more similar than the unlinked pairs that included one-off offences. Whilst results here would appear positive, that is that the crimes of serial offenders show more consistency, they also demonstrate such offenders are not 100% consistent in their in their weapon related offence behaviours:

the median Jaccard's coefficient for the linked pairs was .50 and values ranged from .00-1.00.

Bennell *et al*., (2013) argues that human variability, stemming largely from the impact of situational factors will prevent exceptionally high AUCs. The AUC of .68 was, however, quite a bit smaller than other behavioural case linkage studies that have used ROC analysis to assess discrimination accuracy. For example, Bennell *et al.,* (2009) reported an AUC of .75 and Woodhams and Labuschagne (2012) report AUCs of .77 and .88. Neither of these two studies incorporated one-off offences into their analyses, however this does not seem to be the explanation for the smaller AUC here since Winter *et al.,* (2013) also reported larger AUCs of between .74-.89 and incorporated one-off offences in their sample. Instead, the likely explanation for the reduced AUC in the current study is the lack of differentiation for some variables such as weapon type (e.g., the proliferation of knives in the offences in the sample).

In general, whilst the results are indicative, they are promising in terms of gleaning new insights around predicting escalation and examining consistency within serial sexual offenders. Indeed, that there was evidence of both escalation of violence and consistency of serial offenders contributes at a theoretical level to the evidence base. There are also implications for practitioners. Efforts directed to identify those serial sexual offenders who will progress to more violent offences within their series are clearly of value from a public safety, harm reduction and investigate perspectives. Much risk assessment research has focused upon binary outcomes such as predicting reoffending or violent reoffending (Howard, Francis, Soothill & Humphreys, 2009; Howard & Dixon, 2012; Thornton, 2007) and as such there may be room for a more

nuanced perspective towards risk assessment that incorporates offence behaviour and an escalation of violence. In terms of investigators, whilst in most cases it would not be known until post capture if an offender was unemployed at the time of offence, the other significant variable to predict increasers, use of a surprise attack, can be gleaned from victim statements and as such may be more valuable for practitioners. This benefit of this should also be tempered given the relatively high frequency of the behaviour. Although, the authors have previously outlined that weapon-enabled sexual offenders were *more likely* to adopt a surprise attack. To illustrate, almost half of weapon-enabled and one in five non weapon-enabled serious sexual offenders used a surprise attack (Dawson, Goodwill & Dixon, 2014).

In terms of consistency, one insight of potential importance would be for practitioners not to focus heavily upon weapon-enabled behaviours in terms of crime linking or as a unique behaviour. Whilst serial offenders showed some consistency in weapon-enabled behaviours, the high frequency of knives make it difficult to differentiate (or link) purely on weapon related aspects. In this way, it present it would not be recommended for practitioners to attempt to link crimes purely on weapon related aspects. In this manner, it would be of interest to replicate the current study in countries where there is likely to be greater variation in weapon choices (e.g., in the USA where there is less firearm control than in the UK).

Limitations

Criticisms of ViCLAS coding in Canada have been made in terms of questions over reliability of data or accuracy of data entry (Snook, Bennell, Taylor, House, MacDonald & Luther, 2012). However, it is important to note here that the method of

populating the ViCLAS database differs between the UK and Canada: the UK SCAS incorporates extensive quality assurance and training procedures and data entry is conducted by Assistant Crime Analysts, not police officers. A quality control guide assists consistency in data entry. The present study was based upon the ViCLAS data coding and capture and could be argued to be less subjective compared to other increaser research (e.g., Warren *et al*., 1999) given the training SCAS Assistant Crime Analysts complete. As discussed earlier, there is no established definition or technique to identify increasers as a group - although it could be argued that most of the previous research has explored broadly comparable issues in terms of violence over a series of offences. Yet, a firm definition and technique would enable far more internally consistent research to take place.

Bennell *et al.,* (2013) discuss whether findings from such research are able to generalise to naturalistic investigative settings. Much of the research that has explored consistency has only compared 'serial linked' to 'serial unlinked' crime pairs and therefore the overall sample is biased as it consists of purely serial offenders. The incorporation of presumably one-off offenders within samples provides a far more ecologically valid approach, as in reality; crime analysts have to regularly attempt to distinguish serial and non-serial (e.g., one-off) offences (Woodhams & Labuschagne, 2012). The current manuscript sought to continue the inclusion of such one-off offenders and it is hoped such a trend will continue in the behavioural crime linkage research.

Conclusions

Amongst the wealth of research exploring offending, escalation or consistency, weapon related aspects have not been sufficiently captured. I have previously argued for the need to incorporate weapon use at a greater level into the analysis of crime and as such the aspiration of the current manuscript was to further enhance our knowledge of weapons within sexual offending. There are new insights here worthy of future study. It is noteworthy that surprise attacks and unemployment predicted the increaser status - although this needs to be replicated. Likewise, some evidence of behavioural consistency in weapon and weapon related behaviours was found, with linked crime pairs showing greater consistency than unlinked crime pairs overall. However, the practical implications are potentially limited given the dominance of knives within the sample.

CHAPTER 6

GENERAL DISCUSSION

This thesis aimed to investigate the value of incorporating weapons into the analysis of sexual offending with an aspiration of informing the evidence base around offender profiling. The thread running throughout the chapters is to place the weapon at the centre of the analysis in order to test the viability of the weapon being able to empirically contribute to investigative research. This was identified as a gap in the literature and one that had the *potential* to make an important contribution to the study of sexual offending and offender profiling. The thesis provides a comprehensive exploration of the prevalence, use and consistency of weapons within the offences of one-off and serial sexual offenders. In this way, the thesis is one of the largest collections of weapon specific research to date. The thesis had a number of aims all of which sought to take the reader through a process of analysis with each empirical step delving deeper into the analysis of weapon-enabled sexual offending. This final chapter of the thesis comment upon the findings of the thesis and considers the overall implications of the work.

Chapter 1 explored the relevant literature around weapons, both in general violence and then sexual offending, whilst also attempting to draw on the considerable body of 'offender profiling' literature, relevant as it had incorporated weapons (and motivations) to a degree. This was necessary given the paucity of in-depth relevant theoretical literature to frame weapon-enabled sexual offending. Indeed, as was shown in the Introduction to the thesis, weapons (and any related decisions involving

weapons) are not accounted for by biological theories of aggression, and to a lesser extent the psychological and criminological theories of crime. The core concept was to place the weapon at the heart of the approach (and subsequent analysis), rather than at the periphery. In this manner, the purpose of Chapter 1 was to lay the groundwork in terms of a theoretical approach that could be explored in more detail in subsequent chapters. Results identified themes such as 'control', 'opportunism', 'power', 'anger' and 'deviant use' within the literature and then collapsed these into two dominant themes of 'evidence of planning' and 'violence'. This collection of themes brought more nuance than existing theories such as 'organised/disorganised violence' or 'instrumental/expressive violence', both of which have generated considerable research, but in isolation were not deemed appropriate to capture the full flavour of weapon-enabled offending.

Chapter 2 aimed to establish the basics and took the first steps into the empirical study of weapon-enabled sexual offenders. Working with a sample of 1618 one-off, lone offender-victim serious sexual assaults, the paper explored the prevalence of weapons, the limitations of official statistics and sought to confirm the differences between weapon and non weapon-enabled offenders. This in itself was an important first step for the work and the remainder of the thesis would have been highly problematic if no differences had been identified between weapon and non weapon-enabled sexual offenders. Indeed, even basic weapon prevalence information is of value given the difficulty in capturing accurate weapon statistics (e.g., Office for National Statistics, 2014a). The results indicated that twenty per cent (n=316) of the sexual offenders were weapon-enabled, and whilst there were no demographic differences between the groups, there were many behavioural differences between the groups. Such

a finding is relevant when considering the homology assumption, which would maintain that offenders who use weapons *ought* to be demographically different from those that do not, given the overall difference in offending method. Other results of this chapter indicated that weapon-enabled offenders were more likely to have used precautions, inflicted injury, involved the victim sexually, utilised a surprise attack, attacked outdoors, stolen from the victim and had a more rapid duration of contact between offender and victim. Further multivariate analysis sought to identify the predictors of weapon-enabled offences. Significant predictors were interpreted largely through the lens of 'evidence of planning' and 'violence', the themes drawn from the literature within Chapter 1. Overall, whilst results were not entirely as expected, especially around the lack of homology, the host of other apparent differences indicated the study of weapons could feasibly be a crime scene behaviour worthy of extended study to generate applied insights.

Chapter 3 continued exploring the sample of sexual offenders researched in Chapter 2, but given the previous finding indicating the potential value of exploring weapons, this chapter sought to focus upon how the weapon was obtained and whether this can make an empirical contribution to investigations. The premise of this chapter was to also inform many of the recent discussions around offender profiling, which focus upon the type of crime scene behaviour or wider theme that may be able to add efficiency to profiling (Goodwill & Alison, 2007). In this direction, the concept that weapon obtainment may be something of value was derived from the organised versus disorganised model of violence, which supposes differences ought to exist between such offenders. The basic premise was that weapon obtainment, be it found (i.e., disorganised) or brought (i.e., organised) could represent the broader, proxy theme and

also act as a novel examination of the homology assumption. This chapter was also somewhat inspired by the research papers by Brent Snook and colleagues (e.g., Snook, Taylor & Bennell, 2004; Snook, Cullen, Bennell, Taylor & Gendreau, 2007) that some would consider controversial in adopting novel or challenging stances. In terms of Chapter 3, the controversial aspect was the adoption of the organised/disorganised model, which has been admittedly poorly received by academia (Canter *et al.,* 2004), as an approach that could provide theoretical direction. In terms of the findings, there were almost no demographic differences between the two offender groups, although those who found the weapon at the scene had significantly older victims. Going further, there were many behavioural differences between the groups in how the offence was conducted. For example, offenders who brought the weapon had quicker duration of contact with the victim, attacked outdoors, used a vehicle and a surprise attack more often, behaviours outlined as 'organised' by other researchers (Goodwill & Alison, 2007). Those who found the weapon were more likely to have used drugs, alcohol, attacked at a familiar location and used a confidence approach, behaviours which have, indeed, been highlighted as disorganised behaviours within previous research (Ressler, Burgess, & Douglas, 1988).

Logistic regression analysis indicated that bringing the weapon to the scene was associated with an outdoor offence, use of a knife and victim age, whilst the offender's use of drugs and attacking in a familiar location were the variables related to the offender finding the weapon at the scene. In this way, limited support for the organised/disorganised model was found, although the chapter concluded that the concept of a wholly organised or disorganised offender appears overly simplistic.

Chapter 4 returned to the themes of 'evidence of planning' and 'violence' and sought to test the underlying presence of these themes within weapon-enabled sexual offending using the previous sample of 316 weapon enabled one-off sexual offenders and Multi-Dimensional Scaling (MDS). The chapter was theory led and attempted to overcome many of the perceived weaknesses of MDS (Taylor *et al.,* 2012) by incorporating a 'centre of gravity' approach to counter the potential subjective nature of MDS. The interpretation of the MDS output revealed two behavioural themes (inferred through the crime scene behaviours) that matched the authors expectations - namely: *violence*, with an expressive, (i.e., blunt weapon, head/face wounds) to instrumental (i.e., frequent criminal lifestyle, two or more precautions) dimension running from left to right, and *planning with a* high (i.e., vehicle use, abduction element) to low (i.e., weapon found, burglary element) dimension running from top to bottom. Further work sought to classify the output into four behavioural themes by summing the X and Y coordinates and dividing by the number of variables to generate an overall coordinate or centre of gravity on the two dimensional output representing the themes of planning and violence (See Figure 2, page 66). This resulted in four categories - 'criminal opportunity'; 'criminal control'; 'destructive violence' and 'destructive weapons' each with different combinations of planning (high/low) and violence (instrumental/expressive). Whilst these themes differed in terms of crime scene behaviours, type and use of the weapon, offender - victim age relationship and location of offence, there were no obvious demographic differences between them. This chapter postulated that the conceptualization of planning and violence could hold benefit to the study of other non-sexual and violent crimes.

Chapter 5 switched focus onto a new sample of serial sexual offenders and sought to again pull weapon related aspects to the centre of the analytical approach, specifically focusing upon the consistency assumption of offending profiling. Specifically, the study of weapon related consistency and predicting future escalation of weapon related violence. Essentially, looking to explore how the weapon is used and its consistency (or not) over the offender's series. The chapter focused on a sample of 155 serial sexual offenders and also drew upon the (previous) sample of 316 one-off weapon-enabled offenders as a comparison (i.e., to generate non-linked crimes) around behavioural consistency. Increasers were defined as those whom demonstrated any increase in violence over the duration of their series (as measured by coding a number of weapon related and violence variables) subsequent to their first known offence. In total, one-third of serial sexual offenders were identified as increasing in violence within their series. There were no demographic differences between increasers and non-increasers. Multivariate analysis indicated being unemployed and using a surprise attack during/at the time of the first offence were significant predictors of the increaser group. In terms of consistency of weapon related behaviours, very few offenders used more than one weapon type across their series. Offenders that were weapon-enabled and used a weapon in more than one of their offences were relatively consistent in their behaviours. The chapter concluded by generating crime pairs and within these, 'linked pairs' (those offences committed by the same offender) were more similar in weapon related behaviours than all types of unlinked pairs indicating greater consistency of weapon related behaviours within serial offenders.

Theoretical and practical implications

This thesis has made several contributions to the understanding of weapon-enabled sexual offending, and can be viewed as one of the largest collection of studies seeking to understand the empirical contribution of weapons to the study of sexual offending. The theoretical and practical implications are and the main discussion points will now be turned to.

A lack of Homology

One of the most basic findings that runs throughout the thesis is the lack of demographic difference between weapon and non weapon-enabled offenders (Chapter 2), between those who found versus brought the weapon to the scene (Chapter 3), between different subsets of weapon-enabled offenders (Chapter 4) and between those who increased in their use of violence (increasers) versus those who did not (non-increasers) (Chapter 5). From a theoretical perspective, it is worth repeating that these groups of offenders ought to be different - i.e., based on both the homology assumption and the organised/disorganised model. This basic conversation is of relevance from a theoretical and practical standpoint and supports previous research that did not support the homology assumption (e.g., Doan & Snook, 2008; Mokros & Alison, 2002). This evidence is problematic for the overall concept of offender profiling and has implications for the theoretical underpinning of profiling. To illustrate, in the current collection of studies, there are offenders whom are committing their crimes differently (e.g., differing uses of violence, speed, planning, sexual behaviours and so on) but with very few demographic differences between the groups. Indeed, the wider evidence from the thesis indicates the lack of value of the weapon in predicting any demographic differences between offenders.

However, the position is not as negative as initially outlined in this respect, especially when one considers the many significant behavioural differences to emerge over the course of the thesis, suggesting the weapon has a empirical contribution to make, at one level, towards understanding sexual offending. The findings indicate that this contribution is not as simple as a range of *'if...then'* statements (e.g., if the offender threatens with a gun then the offender is) (Mokros & Alison, 2002) or the A-C equation (whereby 'A' is the crime behaviour and 'C' is the characteristic) (Canter & Young, 2003). This also demonstrates it may be problematic to infer offender demographics from only one crime scene behaviour. The question is perhaps better phrased as *what is the most appropriate manner to incorporate weapons* into such applied discussions. As has been demonstrated, the weapon is not able to discriminate demographically between offenders, and as such, the more recent direction within profiling of exploring broader themes or situational influences (e.g., Goodwill & Alison, 2007; Woodhams, 2012) may be the most viable approach in considering the weapon. However, in this direction, there was no demographic difference identified between those in Chapter 4, the paper that sought to use weapon obtainment as a proxy for one such wider theme (e.g., levels of organisation). The question still remains as to most appropriate theme(s) through which the frame the use of a weapon. It is worth noting that the thesis only refers to sexual offenders and does not necessarily generalise to the practice of offender profiling or homology within other crime types. However, many potentially viable areas could not be explored in the thesis, which may prove able to elucidate the empirical value of weapons. To illustrate, it may be that the weapon is able to predict other aspects of the offender's career or experience such as age of criminal onset, criminal versatility and other psychological, learning or personality traits. Such factors would be worthy of further exploration and it is hoped the thesis will be able to

stimulate new conversations and research in this direction. In order for such original research to be conducted it would be imperative that relevant practitioners (e.g., police officers, intelligence analysts) are routinely able to capture accurate and detailed information around the weapon. If so, future research could still derive valuable insights from a focus on the weapon.

Victim age and weapon nuance

One important difference that emerged within the thesis was around weapon-enabled offenders and victim age. Chapter 2's comparison of weapon versus non weapon-enabled offenders indicated that weapon-enabled offenders tended to offend against victims nearer their own age (mean offender age, 27; mean victim age 27), whereas the victims of non weapon-enabled offenders were on average four years younger than the offender (mean offender age, 28; mean victim age 24). Whilst interesting, Chapter 3's findings perhaps shed more light into terms of this age influence; those that brought the weapon had a significantly younger victim age (mean of 25 years) whilst those who found it at the scene had a significantly older victim age (mean of 34 years). To remind the reader, there were no significant differences in the offender ages in these groups. The work of Chapter 4 again provides similar insights around the different sub-groups of weapon-enabled sexual offenders. The offenders who were part of the low planning axis in the MDS output had higher victim ages (i.e., 'criminal opportunity' a mean of 37 years; 'destructive violence' a mean of 33 years), whereas the offenders at the upper part of the planning axis had younger victims (e.g., 'destructive weapons' a mean of 25 years, 'criminal control' a mean of 23 years). This illustrates some of the additional depth that can be gained in exploring weapons and the

requirement to capture extra details, such as how the weapon was obtained or elements of planning in order to derive insights.

The interpretation of this finding relates to the concept that offenders are rationalizing and capable of assessing risk and reward during their offences (Beauregard *et al.,* 2007; Cornish & Clarke, 1986), and that the weapon can reflect this. Firstly, the above age finding highlights the notion of specific victim preference or 'targeting' within such a planning element to the offence. To remind the reader crime scene behaviours such as bringing the weapon and falling upon the high planning part of the MDS axis (e.g., use of a firearm, using a vehicle, an abduction element) as indicators of planning. This is consistent with other researchers into 'planning' crime scene behaviours such as Canter, Bennell, Alison & Reddy (2003), Ressler, Burgess & Douglas, (1988) or Goodwill and Alison (2007). Goodwill and Alison (2007) highlight the concept of 'near-peer' within rape, arguing that many offenders target victims similar to societal age preferences for sexual partners. It is also possible to incorporate evolutionary perspectives towards sexual offending (Dunson, Colombo & Baird, 2002; Thornhill & Palmer, 2000) in which offenders are considered to assess the fertility and attractiveness of the rape victim and that female fertility begins to decline in the late 20's. In this way, offenders who are demonstrating planning (by bringing the weapon) are attacking younger (e.g., more evolutionary desirable) victims. Conversely, offenders who did not show high levels of planning tended to have older victims. This might indicate a lack of victim targeting and in a sense such victims are less vulnerable and could be perceived by the offender as more of a risk or challenge. If so, this would explain the increased likelihood of obtaining weapons during the offence. This is in

agreement with the physical strength hypothesis (Heide, 1993) which postulates younger offenders are more likely to use weapons with older victims to facilitate the offence. In the current samples the offenders did not differ their age, the difference is in respect of the victim age and the association to the weapon.

The difficulty for applied practitioners and profilers would be how to best make use of this information. This is a challenge given the potential versatility of weapon usage and obtainment, e.g., high planning offenders that only threaten the victim with the weapon; offenders that show low planning, opportunistically obtaining the weapon at the scene, or those who use it to physically harm. In itself, the presence of a weapon, and especially a simple 'binary yes/no' weapon variable would not seem able to discriminate between offenders. Added to this would be the deeper layers around weapon obtainment, type and usage that would be required for police or other crime analysts (e.g., those outside of SCAS) to routinely capture to enable such data conversations.

A question posed in the introduction to the thesis related to whether the levels of violence used are driven by the weapon, that is, are some weapons inherently 'instrumental' or 'expressive' in nature or is the weapon use driven by offender's motivation, or potentially wider situational or contextual factors. This remains a knowledge gap, the current thesis found the majority of weapons within sexual offences to be knives or sharp instruments, an expected finding given the focus on England and Wales and the high levels of firearm control. Whilst knives were the most frequent weapon across all groups, the less organised offenders were more likely to use a blunt

weapon. The inference being a blunt weapon is more expressive, an inference supported by the position of blunt weapon at the furthest point on the expressive axis on the MDS output in Chapter 3. This would be consistent with the instrumental/expressive model of violence (Bartol, 1991; Fesbach, 1964) and that of disorganised offenders (Douglas, Burgess, Burgess & Ressler, 1992).

In Chapter 3 there were no differences in terms of levels of injury inflicted comparing those who brought or found the weapon. However, this chapter provides additional understanding with some of the results that *approached* significance: those who brought their weapon to the scene were more likely to threaten with the weapon, inflict injury to the head and use violence when deemed unnecessary. One area of research that is lacking in this respect would be in-depth narrative interviews with weapon-enabled offenders to specifically explore their background, experience and perceptions of weapons. This could yield benefits around understanding the motivations around weapons and potentially provide answers to some of the questions that have been raised over the course of the thesis. This could also generate wider implications to the study of other crimes involving weapons and the risk assessment or treatment of weapon-enabled offenders.

Weapon use, violence and planning - wider benefits

One of the themes running throughout the thesis was that weapons are under researched, but that their use is also under theorised; as outlined in the thesis introduction, weapons had been an *element* of a number of theories but had never formed a major aspect. This was something that each of the Chapters specifically

sought to rectify. To remind the reader, the organised/disorganised model, whilst glamorised by the media, has not been welcomed or validated through empirical study and has been labeled as a unscientific simplification of offending (see Canter, Alison, Alison & Wentink, 2004). The findings from Chapter 3, provided some support for the organised/disorganised model, although found it to be overly simplistic. The instrumental/expressive model is far more established (Bartol, 1991; Block & Block, 1992) although, similarly, it has been critiqued for being overly simplistic (Bandura, 1973). The findings throughout the thesis highlight the potential complexity of weapon-enabled crime given the variety of uses for a weapon and previous theories do not seem sufficiently developed to capture such subtleties. As such, the conceptualisation of weapon enabled sexual crime outlined in the thesis, that of aligning 'levels of violence' and 'planning' together, may prove valuable as a model to study other crimes.

Given the many differences between weapon-enabled sexual offenders, the focus upon weapons could have wider implications for psychology. As outlined in the thesis, the specific focus upon the weapon could offer a new direction for therapeutic work with such offenders. Some authors have already discussed the possibility of incorporating an offender's index offence into treatment (West & Greenall, 2011) and other research that has sought to demonstrate links between mental health and violence which have, in-part, included weapons (Catanesi *et al.,* 2011; Langevin & Curnoe, 2013; Michie & Cooke, 2006). The question is whether weapon-enabled offenders may present unique therapeutic needs. At the moment this question is unresolved. West and Greenall (2011) have argued that clinicians ought to give more focus to the offence circumstances of a client in order to generate more informed hypotheses about the

aetiology of an individual's offending. Specifically, that by focusing upon the index offence meaningful differences between offenders can be identified and that this can help reduce the reliance on self-report within therapeutic environments. West and Greenall (2011) provide an interesting case study of a son who killed his father with a knife in the family home. The offender's self-report was of an expressive crime of passion following a heated argument between father and son. However, West and Greenall (2011) present a number of crime scene behaviours that illustrate a different perspective, such as how the murder weapon (the knife) had recently been sharpened and how the offender had a far longer-term interest in weapon collections resulting in an assessment of personality disorder. The case study does not present information from the actual murder investigation and the direction of the police, and in this way it is difficult to know whether the case study is a demonstration of thorough clinical assessment or collaborative work with the police. Nonetheless, the argument made is sound, that examining the index offence can contribute to psychological assessments and interventions. Similarly, others have argued that clinicians could improve the specificity of interventions based upon differences in actual offending behaviours (Crighton & Towl, 2008). It is hoped the current work can stimulate new conversations around the value of not only index offence work, but also the specific role of the weapon.

Consistency of weapons

Chapter 5 attempted to explore the contribution of weapons to one of the key tenets to offender profiling, the consistency assumption. This was both in terms of consistency and the prediction of increasing violence within serial offenders. These two

issues were selected for study given the applied benefits for investigation, that of crime linking and preventing future harm, and because both areas lacked empirical research involving a specific weapon focus. Whilst many studies have explored the behavioural consistency of offenders (Burrell, Bull & Bond, 2012; Tonkin, Santtila & Bull, 2011) and many have explored the consistency of serial sexual offenders (Grubin *et al.,* 2001; Woodhams & Labuschagne, 2012; Yokota *et al.*, 2007), the concept of weapon consistency has barely been focused upon. In terms of predicting offenders that may escalate in violence, there has been again limited research. The strongest study (Warren *et al*., 1999) only focused upon an increase in subjectively measured blunt trauma. Chapter 5 sought to address this gap by exploring the consistency of weapon related behaviours and the escalation of violence within a sample of serial sexual offenders.

In terms of weapon-enabled sexual serial offenders, in those cases where the serial offender had more than one weapon-enabled offence in their series, almost exclusively the same weapon (that of a knife) was evident. Very few serial offenders used more than one weapon type across their series. In addition, linked crime pairs were significantly more similar in weapon related crime behaviours, with larger effect sizes, than pairs composed of the crimes of two *different* serial offenders, two *one-off* offenders, or a mix of the two. Indeed, this inclusion of one-off offenders (generated through the sample used in chapters 2-4) into the analysis is a methodological improvement on many other crime linkage studies with serial sex offenders (see Woodhams & Labuschagne, 2012), increasing ecological validity. The finding that serial offenders showed more behavioural consistency in terms of weapon enabled crime behaviours provides empirical support for the consistency assumption. However,

given the high frequency of knives within the sample, the finding is difficult to place in an applied context, raising the question as to whether this is "meaningful consistency" (Snook *et al*., 2008, p.1261). Quite simply, it would not be recommended for practitioners to attempt to link crimes purely on weapon related aspects. In order to differentiate the crimes of serial offenders there needs to be a level of distinctiveness (Bennell & Canter, 2002) that was not observed with weapons. Unfortunately, with the data obtained from SCAS it was not possible to explore the specific types of knives, the majority were 'general' or 'kitchen' knife. It may be that the concept of weapon specific linking may be more obtainable in other countries, that have greater variations of weapons on sale (e.g., the USA), or in those weapons that are highly unique. Both of these issues would merit further research.

The second area of study in Chapter 5 sought to add more nuance to the discussions around risk assessment or the prediction of violent offending, again a topic that has been largely absent of weapon related consideration (Howard & Dixon, 2012; Howard, Francis, Soothill & Humphreys, 2009). The chapter findings reported that an unemployed status and a surprise attack *at the time of the first offence* were significant predictors of increasing in the use of violence. This could lay the groundwork for innovative insights for practitioners, however, challenges remain in terms of practitioners knowing which offence in the series is being examined (i.e., whether it is the first offence), whether an offender in unemployed at the time of an investigation, and the relatively high frequency of surprise attacks. Indeed, the results from Chapter 2 indicated that almost half weapon-enabled and one in five non weapon-enabled offences involved a surprise attack. Furthermore, Chapter 4 established that those

offenders that brought the weapon to the scene were more likely to use a surprise attack, although were no more likely to inflict injury.

Conclusion

The current thesis is the first in-depth suite of studies into weapon-enabled sexual offending. The work is clearly not without limitations, and these have been discussed within each individual chapter. Despite the limitations, the thesis should be seen as laying important groundwork around the empirical contribution of weapons to our understanding of sexual offending and offender profiling.

The work has also demonstrated the lack of inclusion of specific weapon related aspects in the investigative psychology literature and has attempted to drive the topic forward and stimulate new conversations. As was discussed, many differences were identified between weapon and non-weapon enabled offenders, and between different subsets of weapon-enabled offenders themselves. This clearly demonstrates that the weapon merits a place in the study of violent and sexual offending. However, the differences related to how the offence was conducted and not the demographics of the offender. It was perhaps optimistic that one crime scene behaviour would discriminate between offenders in such a manner, although this comfortably fits into the previous theories around offender profiling, such as the 'A to C equation' (Canter & Young, 2003). In many professions there are calls for greater evidence based approaches; this has occurred in the medical profession (Black, 2001; Guyatt *et al.,* 2008; Lum *et al.,* 2012), the police profession (Dawson & Stanko, 2013; Sherman, 1997), and is now also taking root in the profiling profession (Alison & Rainbow, 2011). The premise with

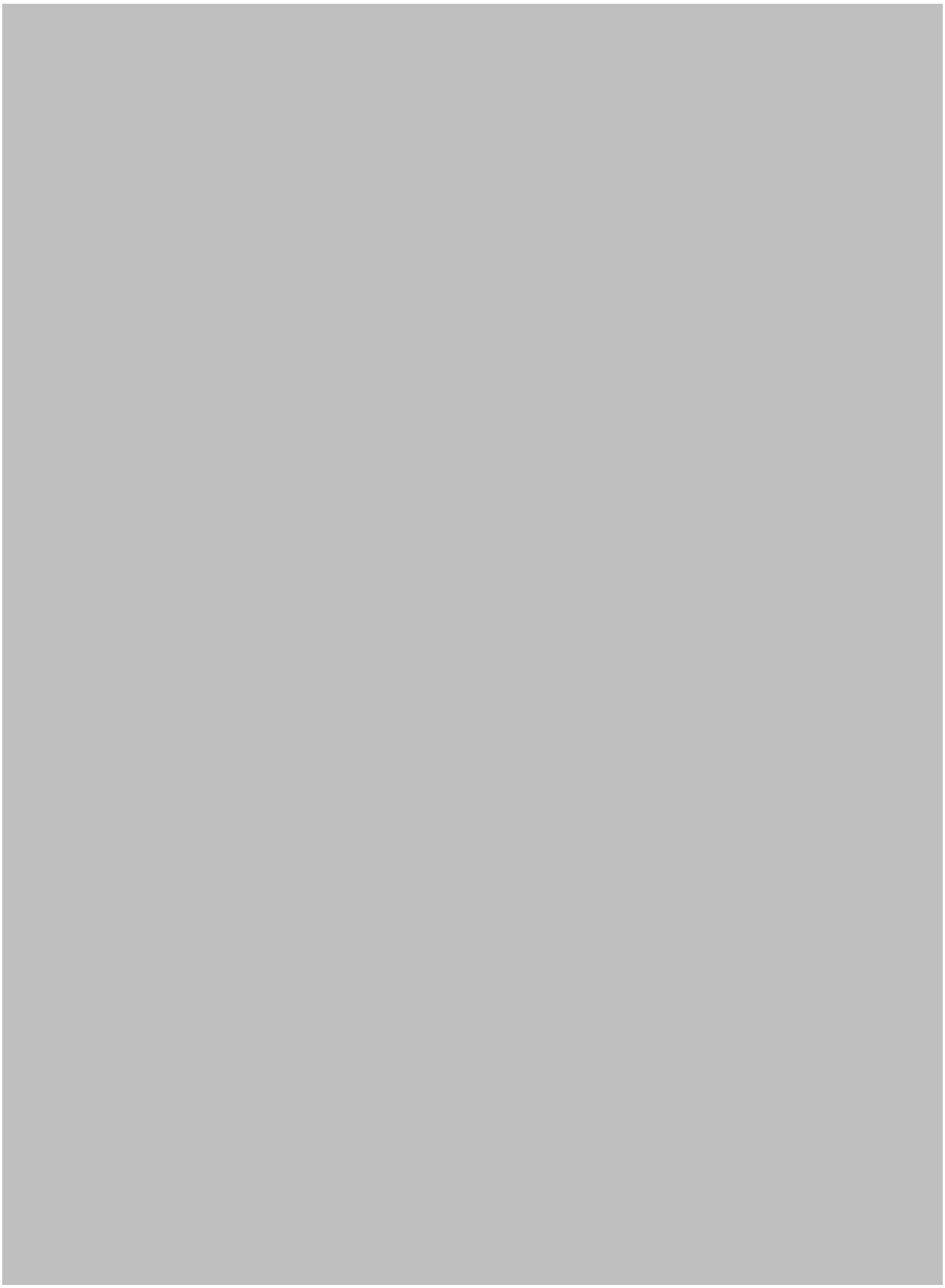
regards to profiling is that even trivial aspects of an offence can be tested and could form the basis for predictive inference; as such the weapon was a viable candidate. In this way, even negative findings can contribute to the evidence base and decision-making.

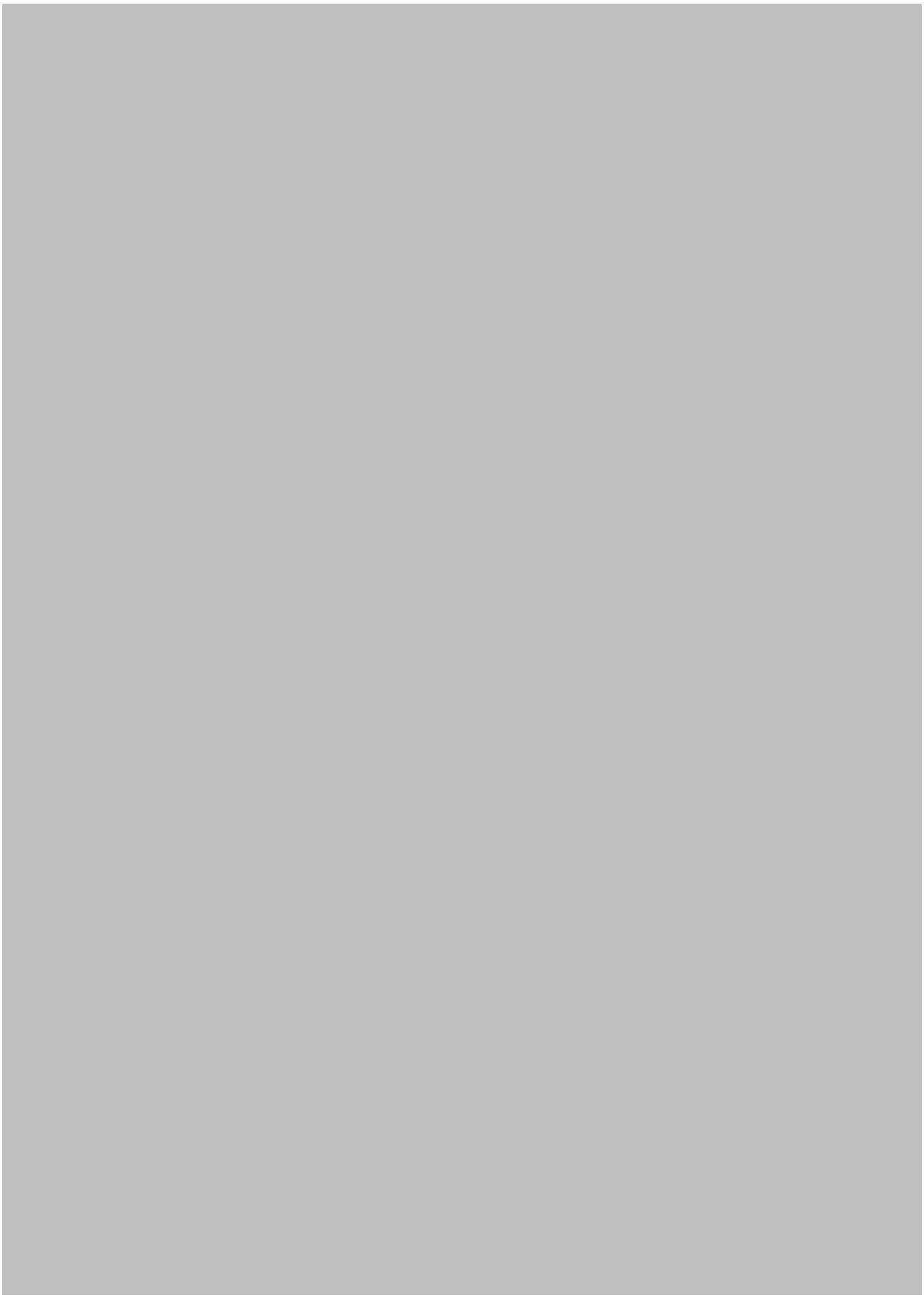
The negative findings in the thesis challenged the homology assumption, given the lack of demographic differences between weapon-enabled and non weapon-enabled offenders, as well as groups of weapon-enabled offenders, and even through some evidence was found for the consistency assumption, the practical applications for crime linking were largely negated by the high frequency of weapons in the sample. The conclusion here reflects upon the quote by Goodwill and Alison (2007) that featured in Chapter 3 - "the real challenge [for profiling] is to identify what kinds of behaviour should be used to profile what kinds of characteristics". (p. 838). Indeed, it may be that the roots of the weapon are embedded in wider themes such as the offender's biology, learning or criminal background. Furthermore, as raised in the individual chapters, there is follow on research around the weapon that still could explore wider themes such as mental health, treatment and risk assessment and the potential viability of using weapon related information within the offence as part of the therapeutic milieu. These would all be exciting additions to the evidence base around weapon-enabled offending and assist in understanding whether and in what way weapons can add more of a empirical contribution to profiling.

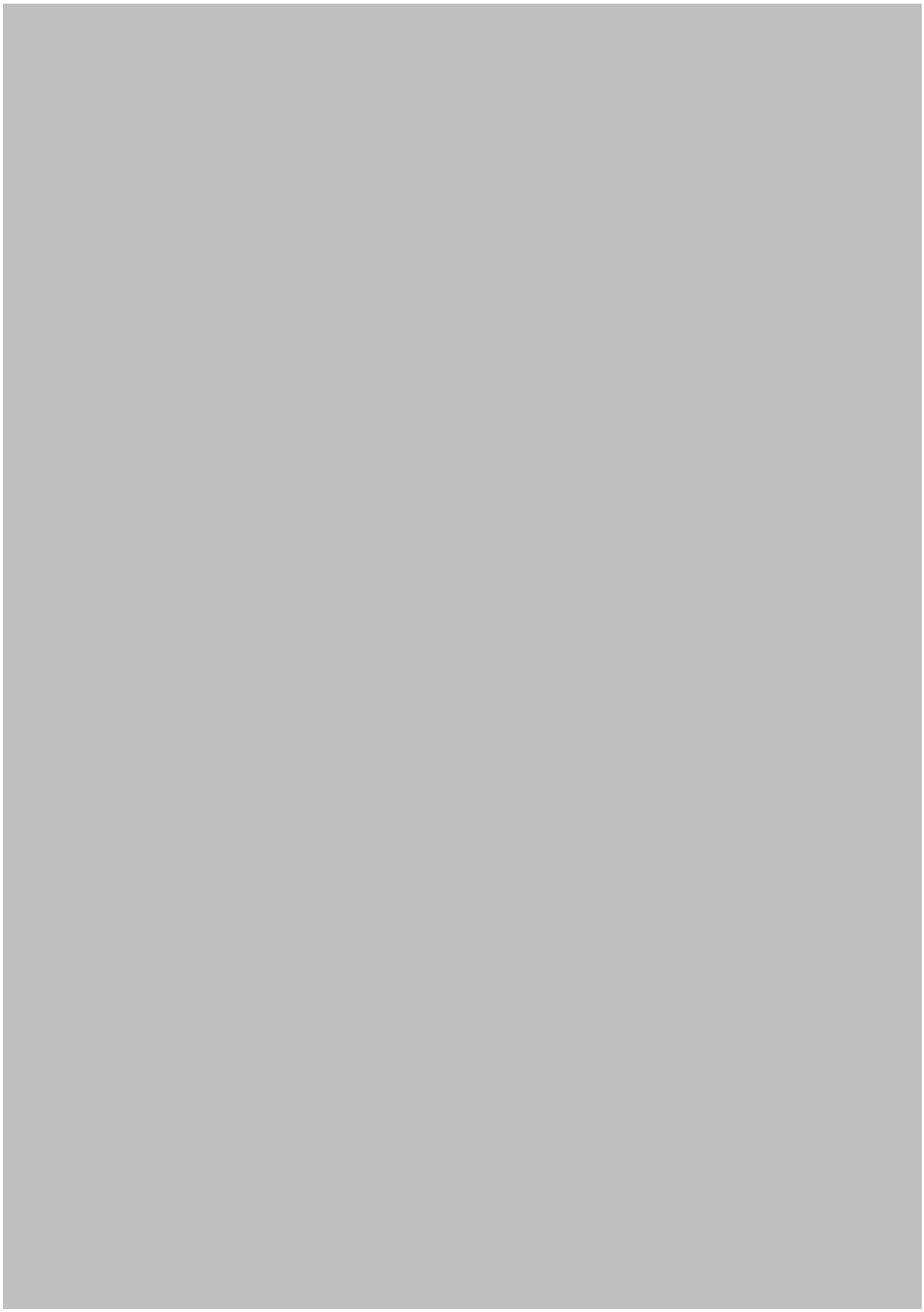
In exploring weapon-enabled offenders, the notion of nuance has been a running theme and understanding such subtleties around the weapon may yet hold implications

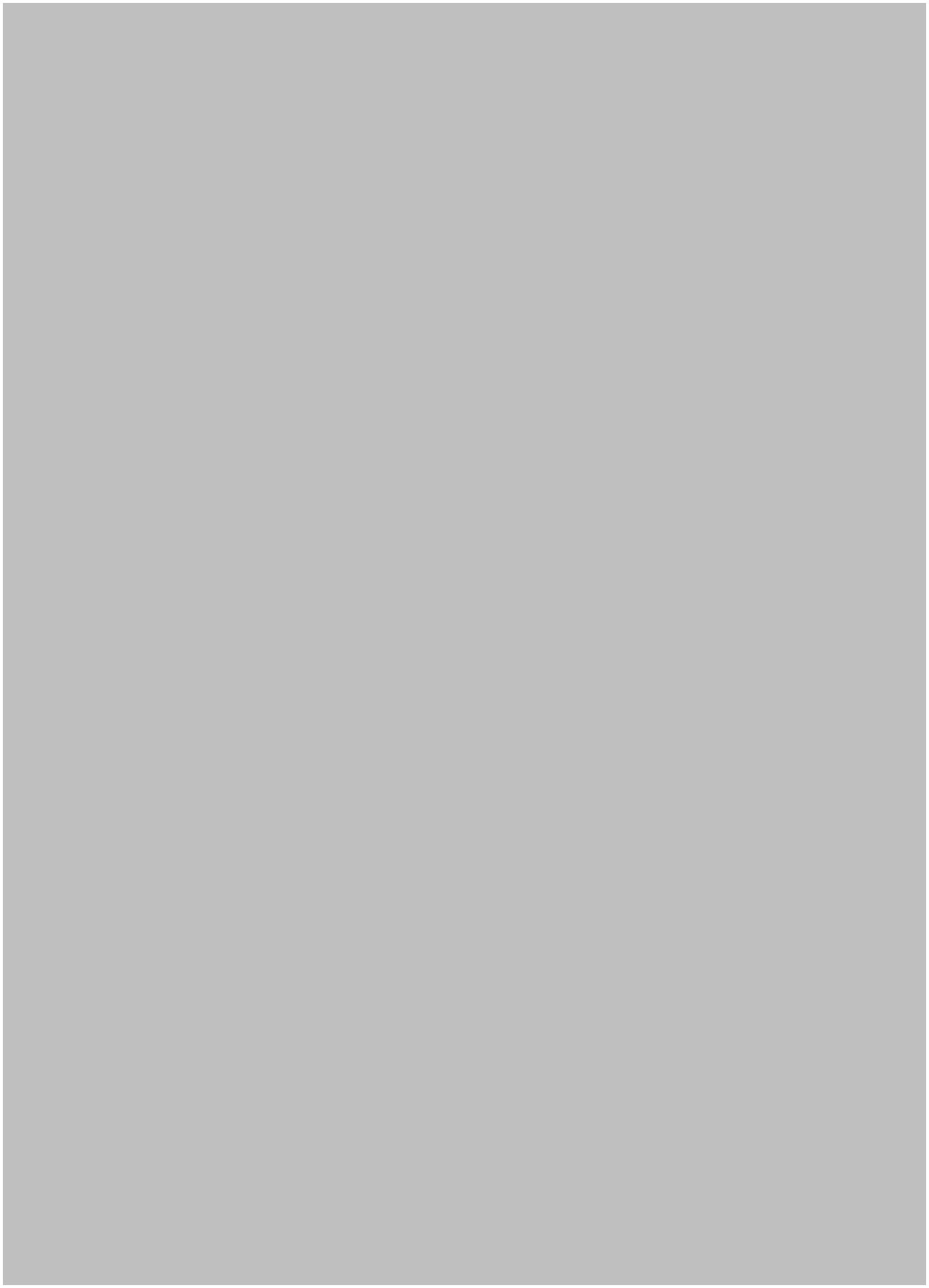
within a psychological framework. It is hoped that the thesis has established somewhat of a starting point and it is hoped future research continues to explore the evidence base around weapon-enabled offending.

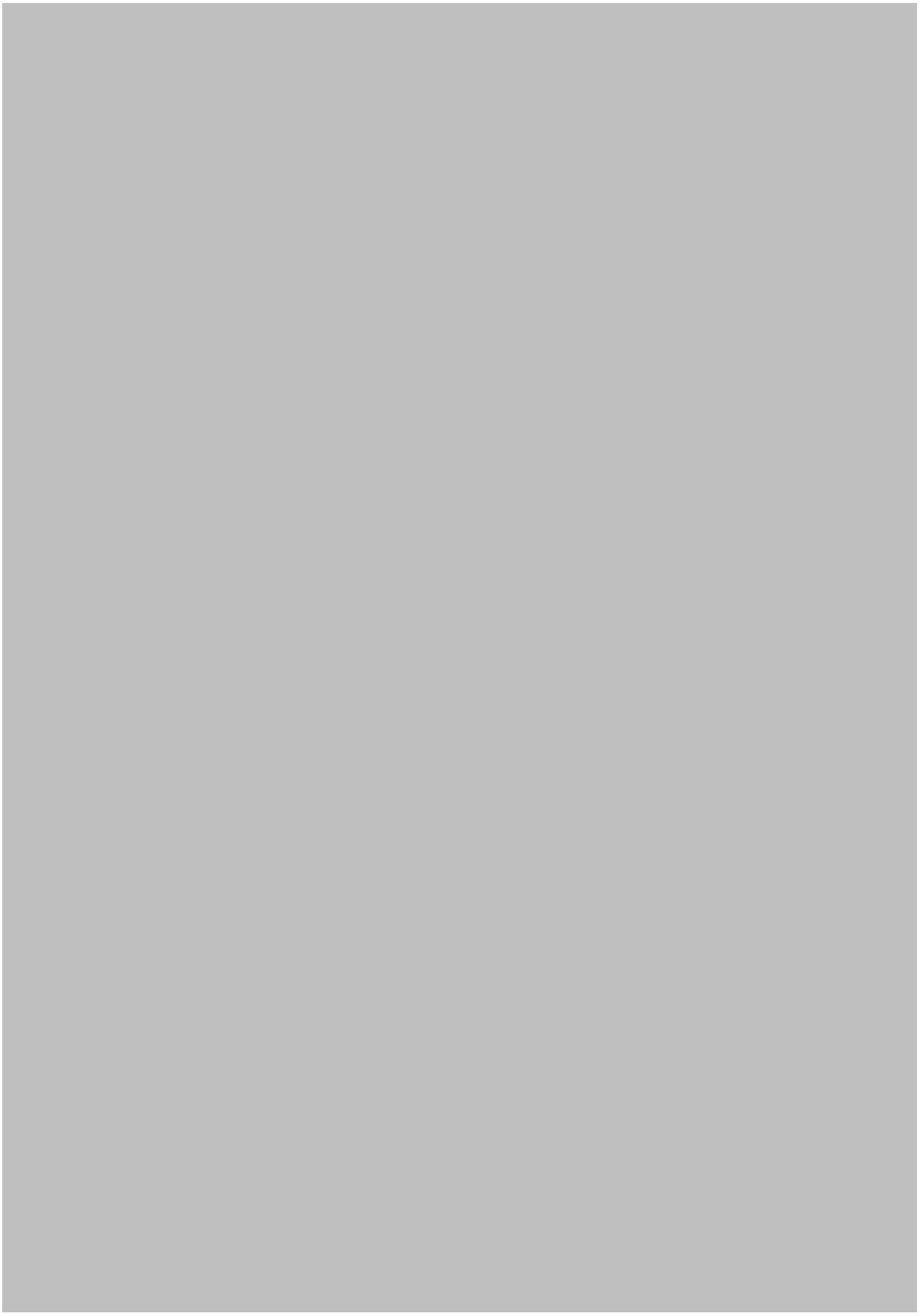
APPENDIX I - ETHICAL APPROVAL OF STUDIES

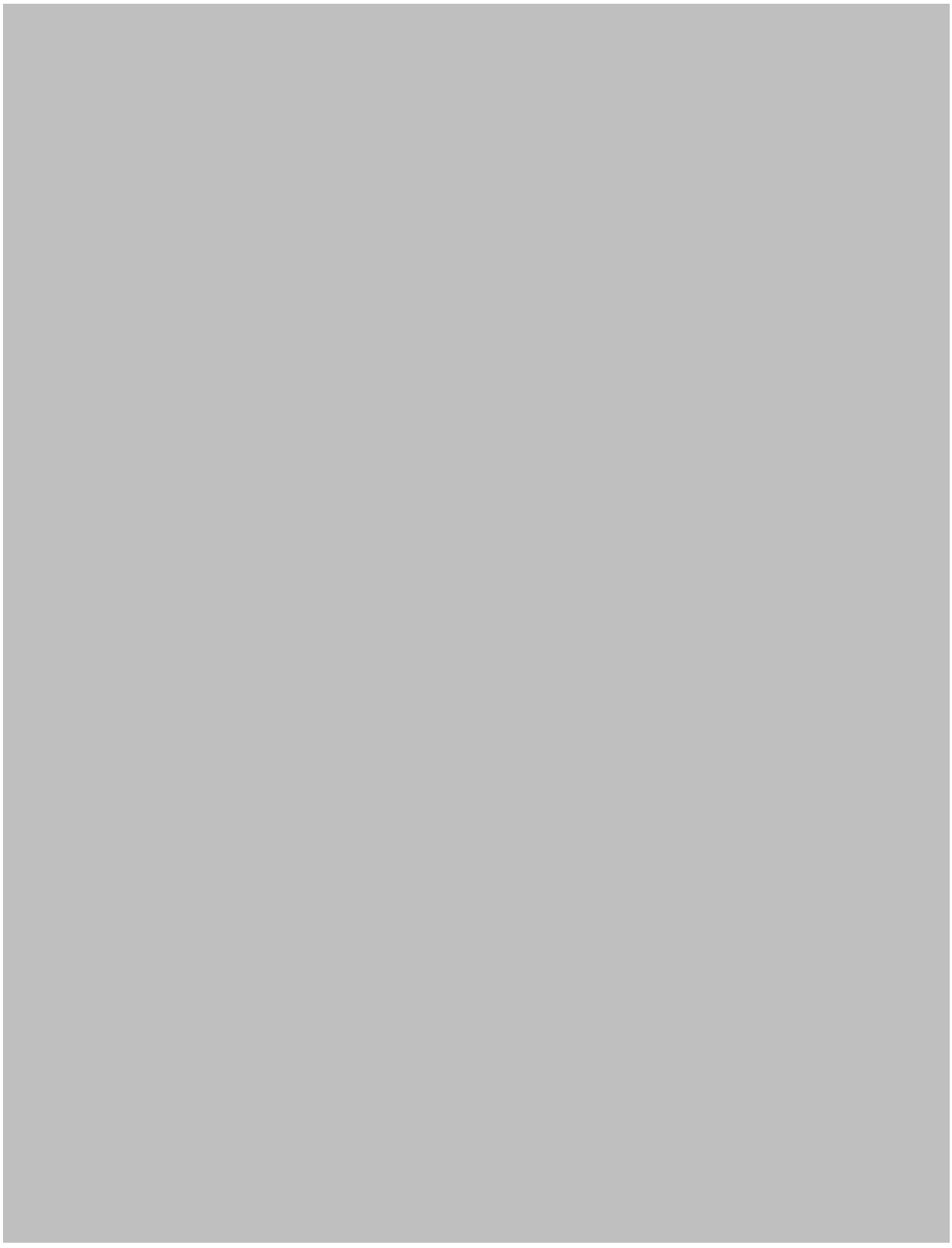


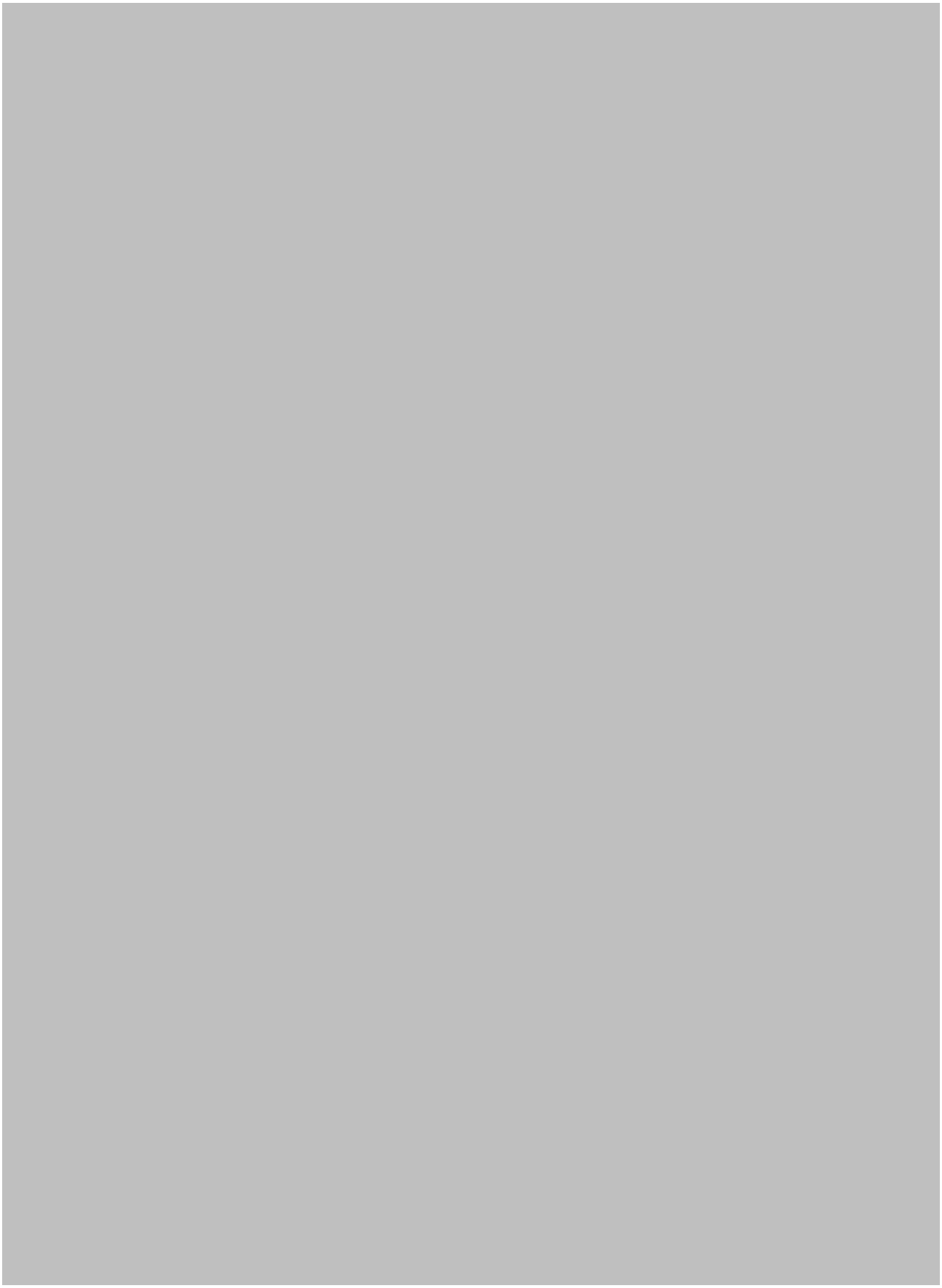


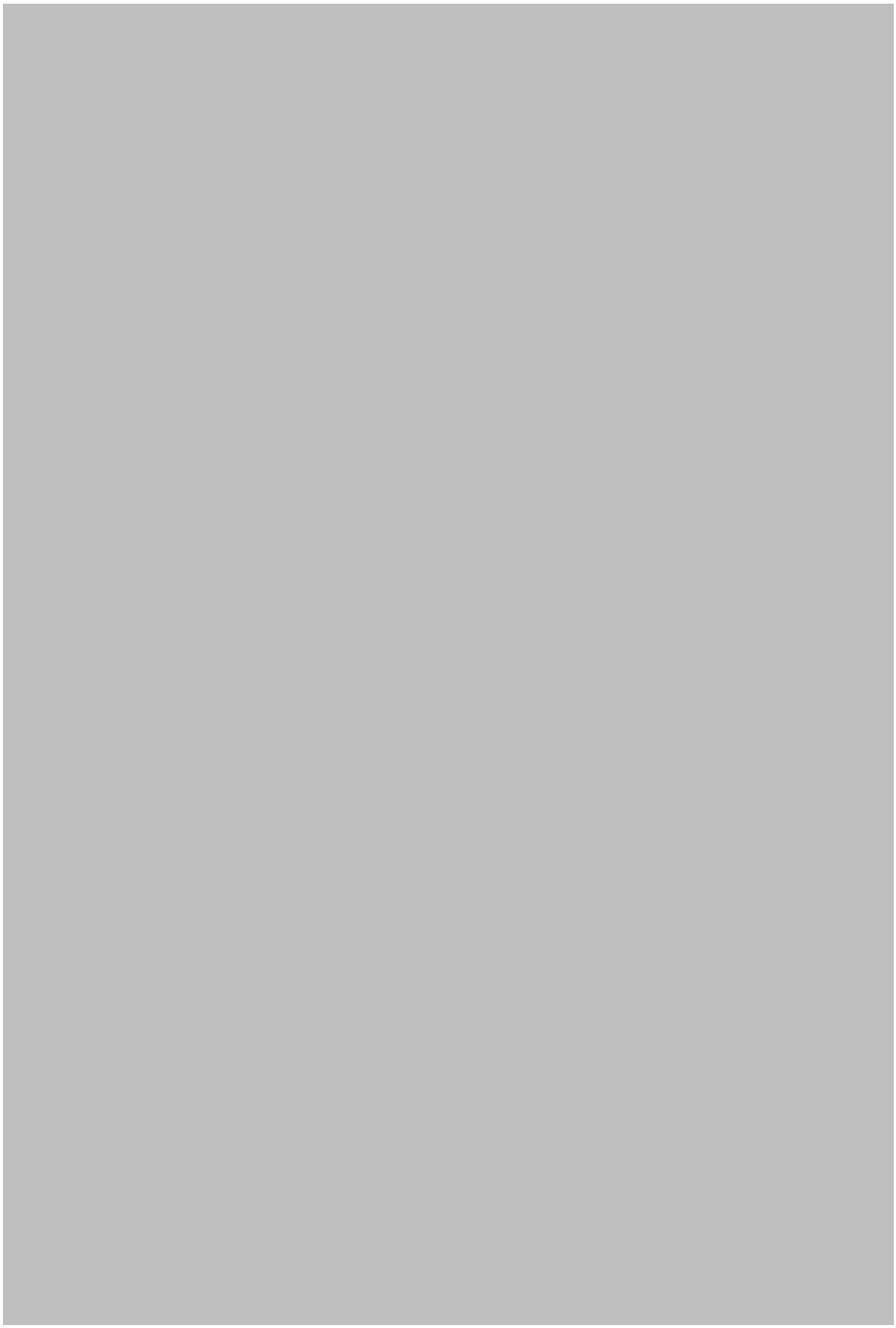


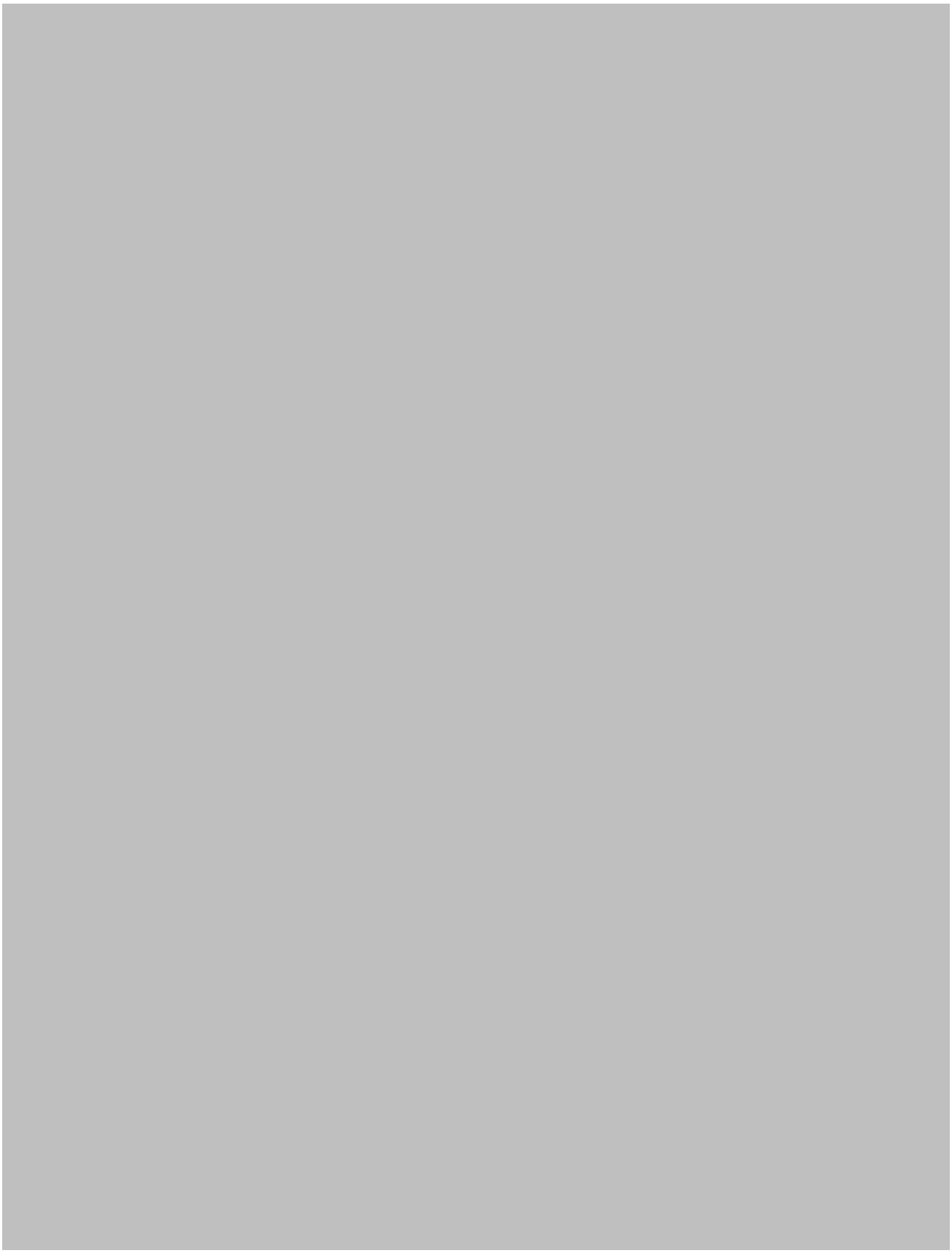


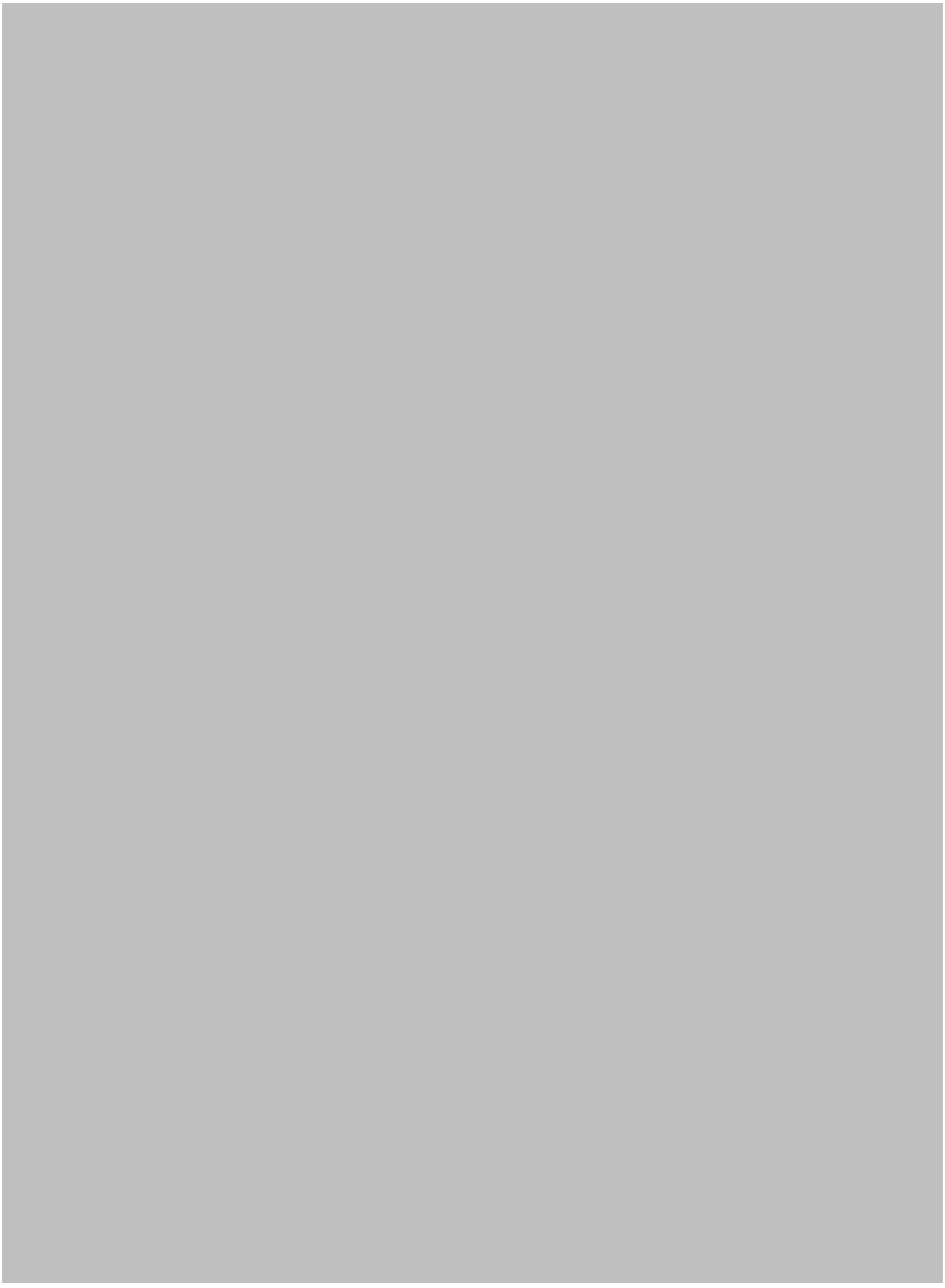


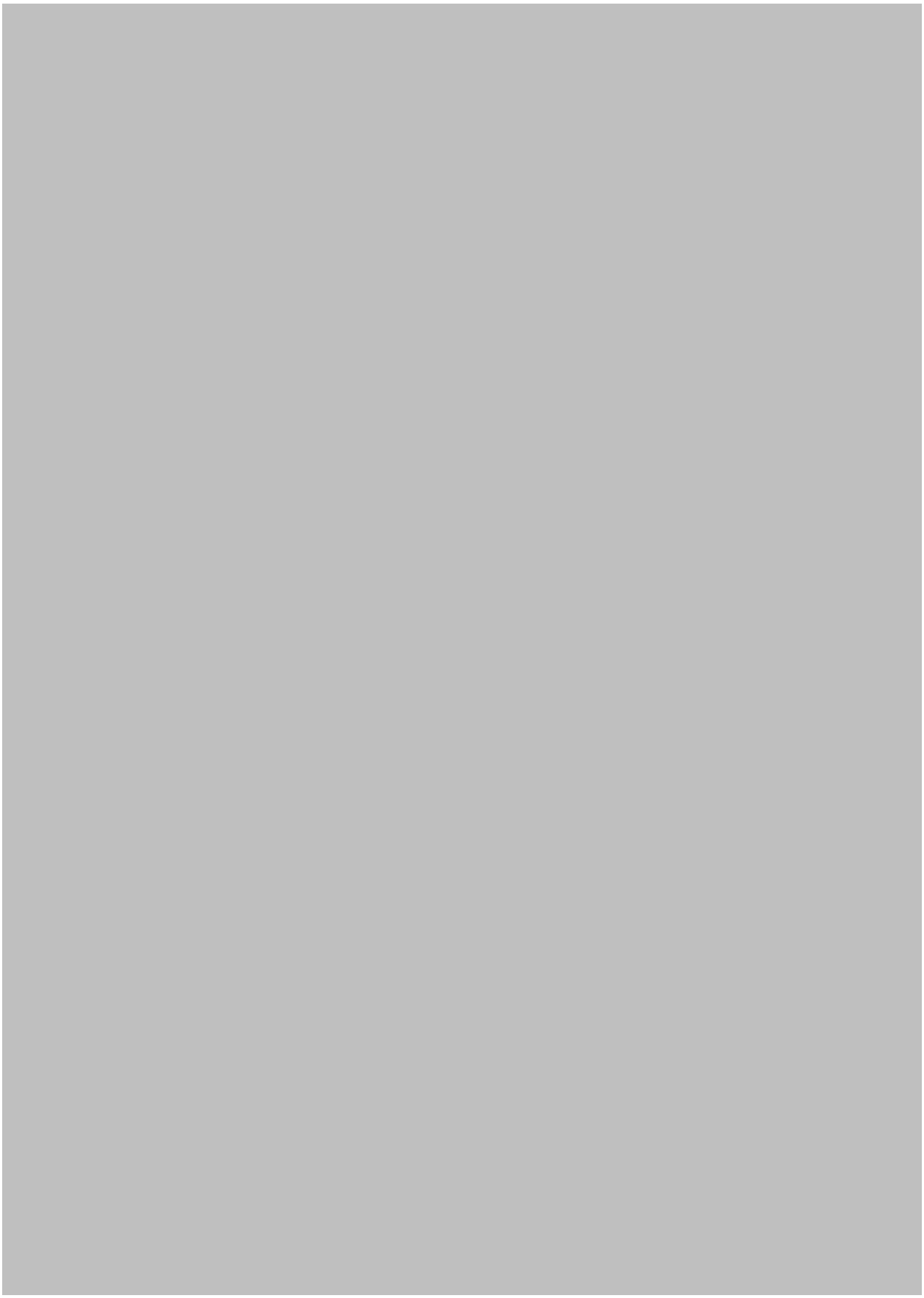


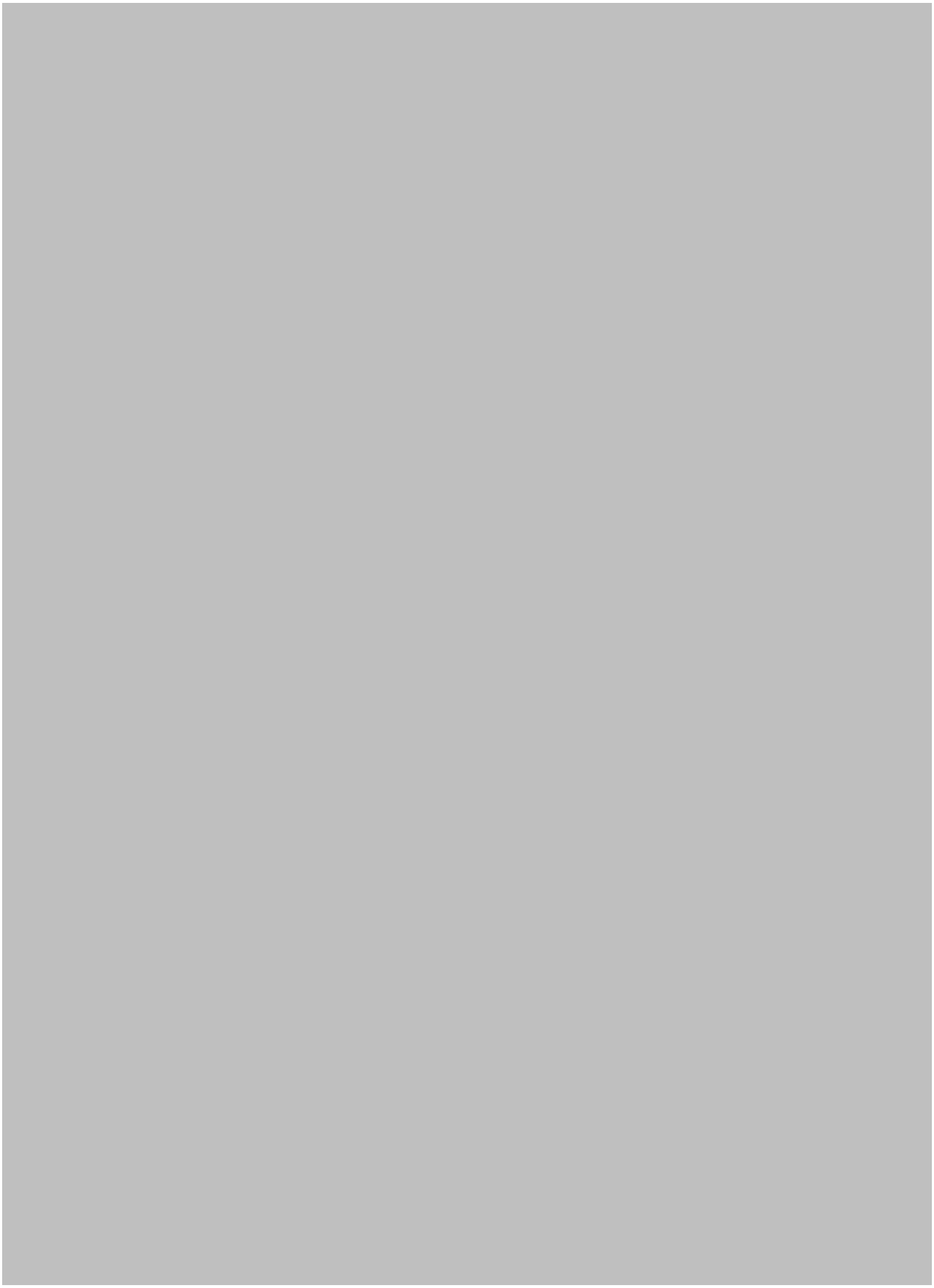


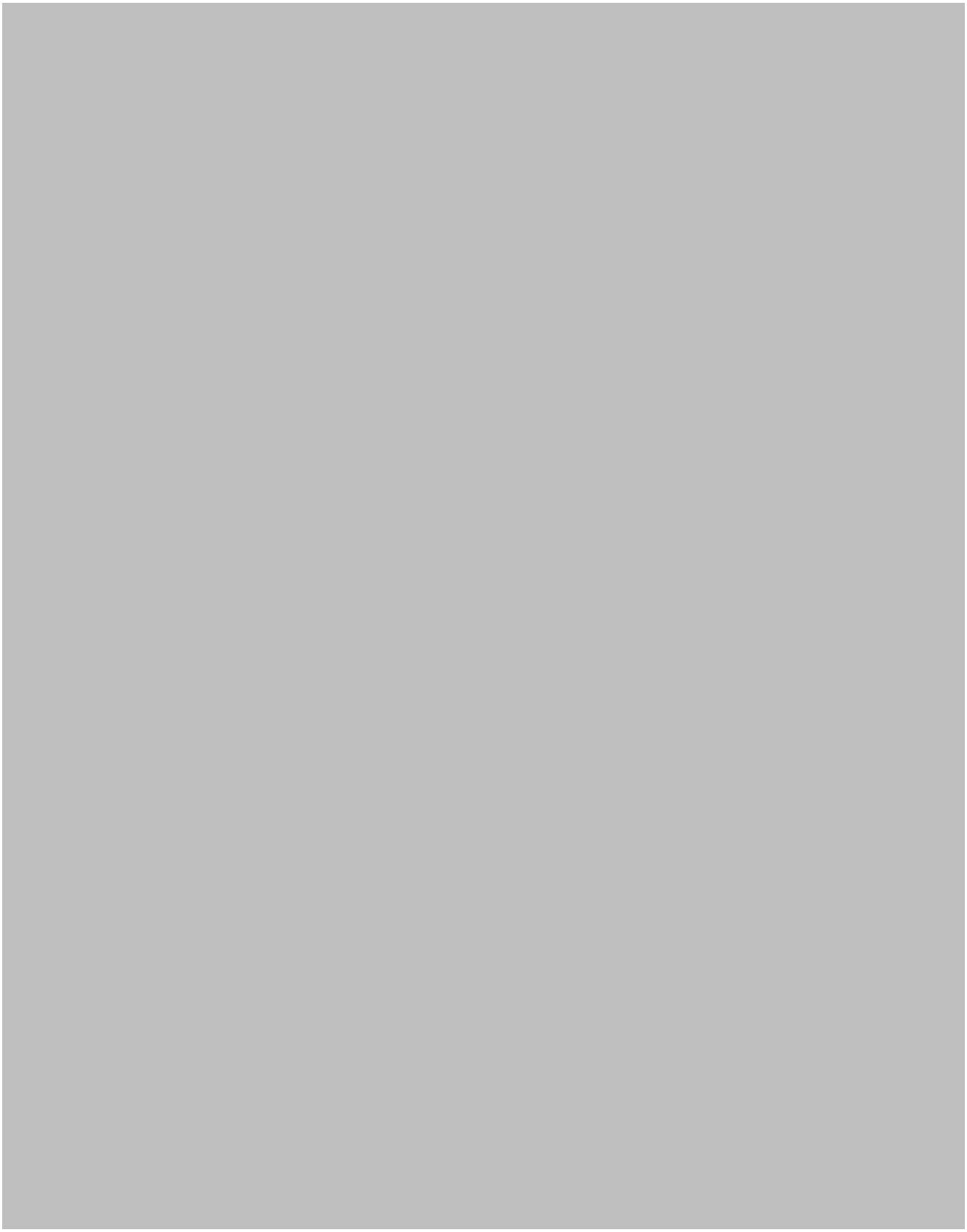








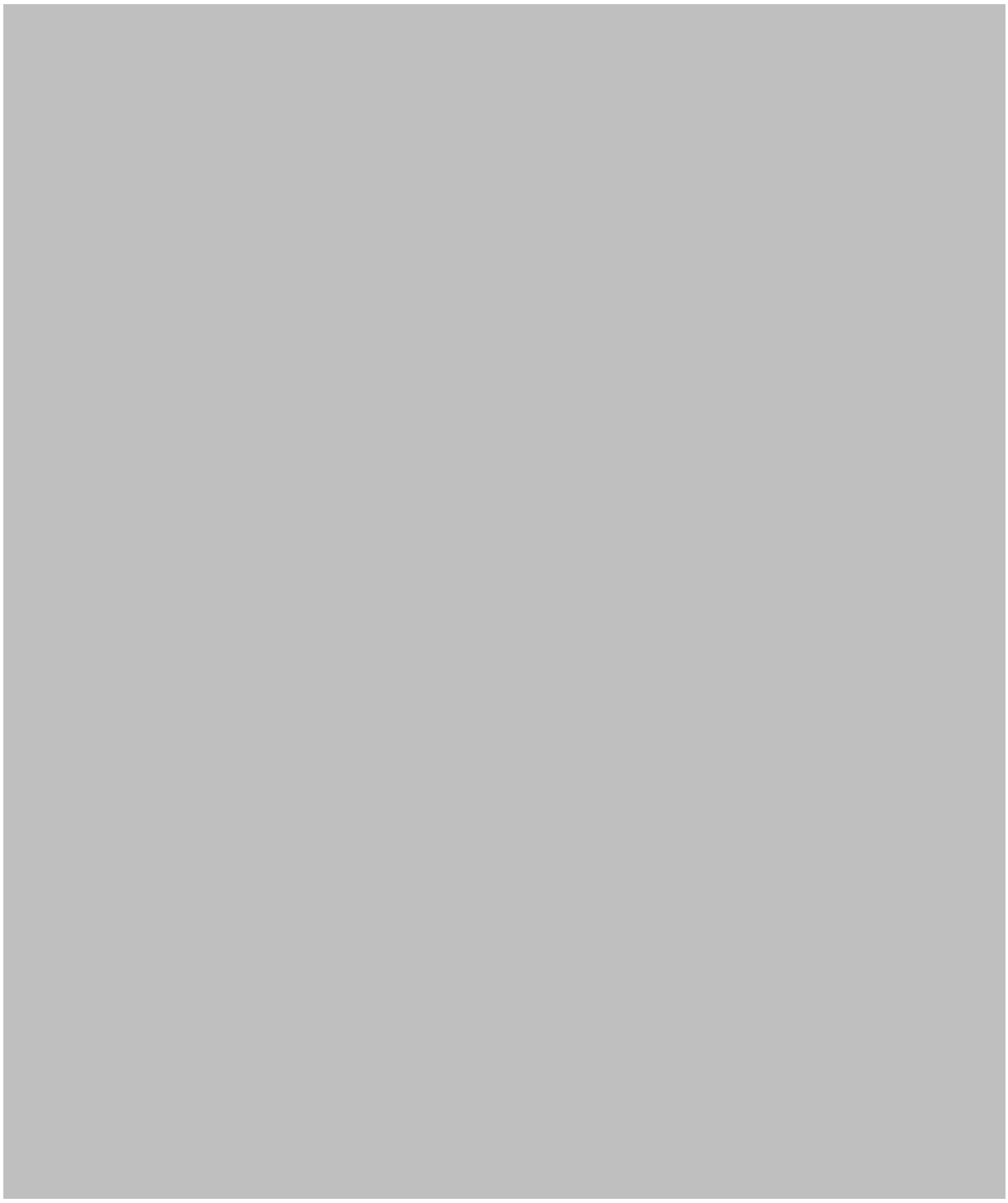


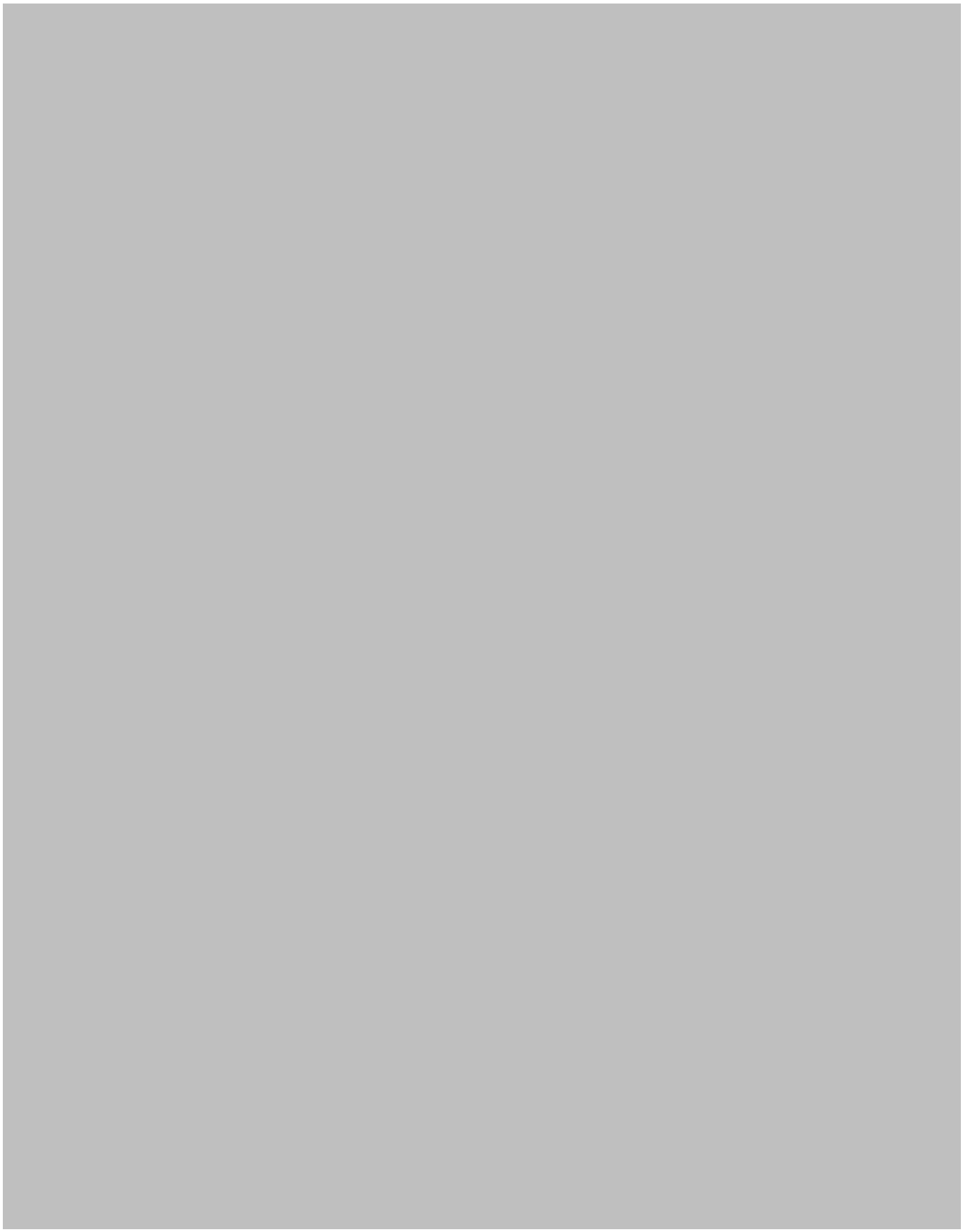


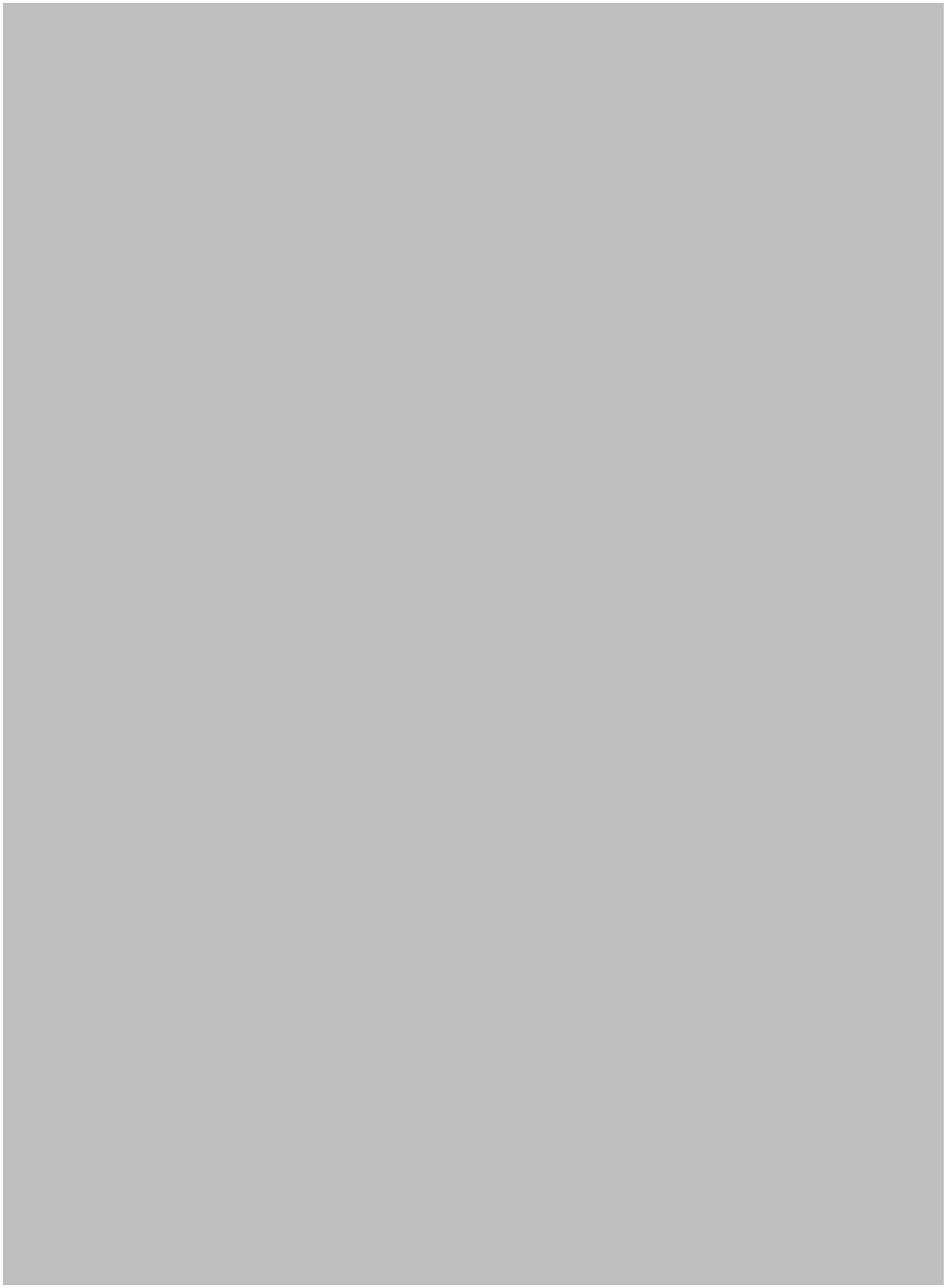
Serious Crime Analysis Section (SCAS) data access proposal

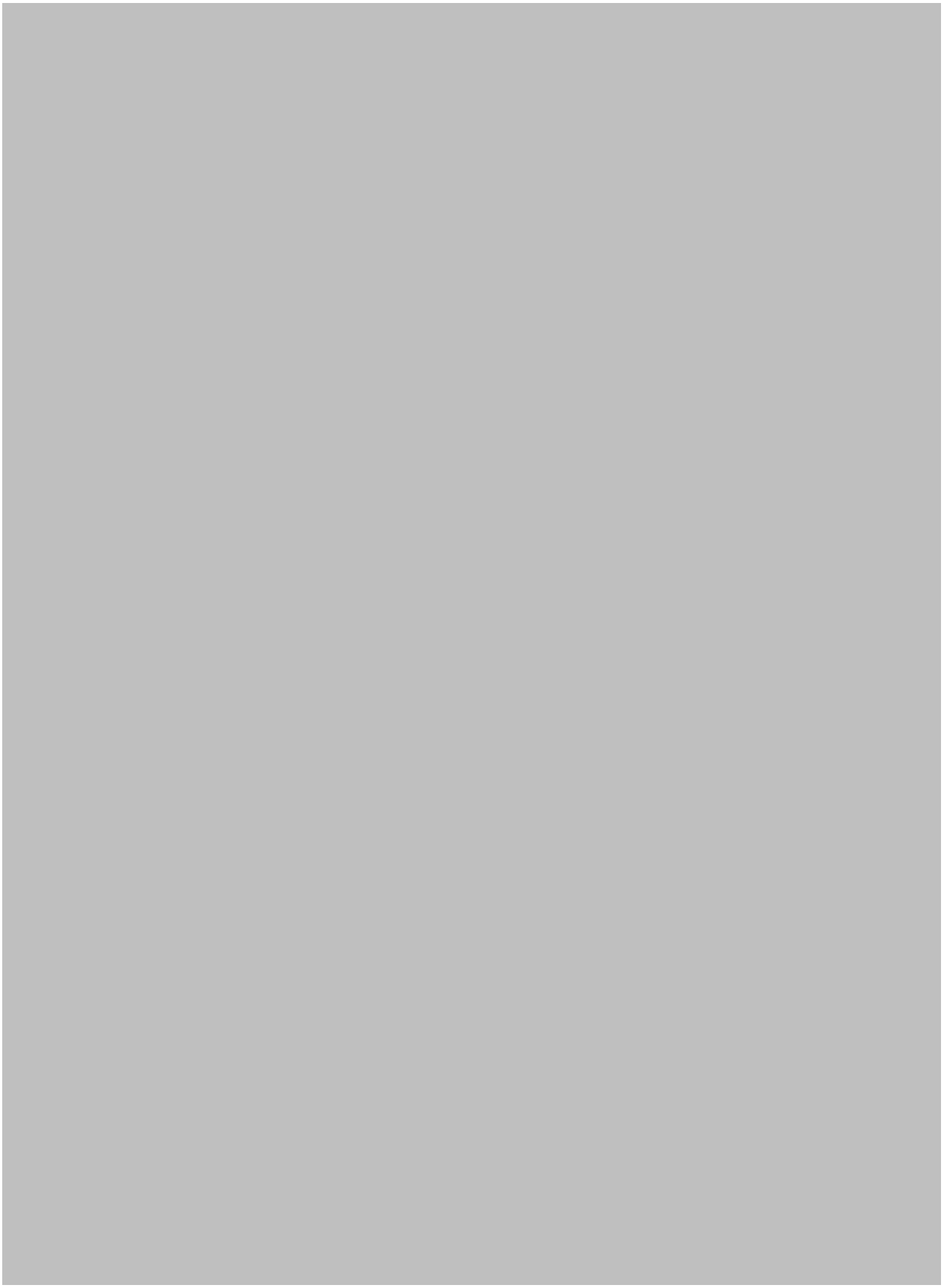
Title: Offender weapon use in stranger sexual assaults (*Revised*)

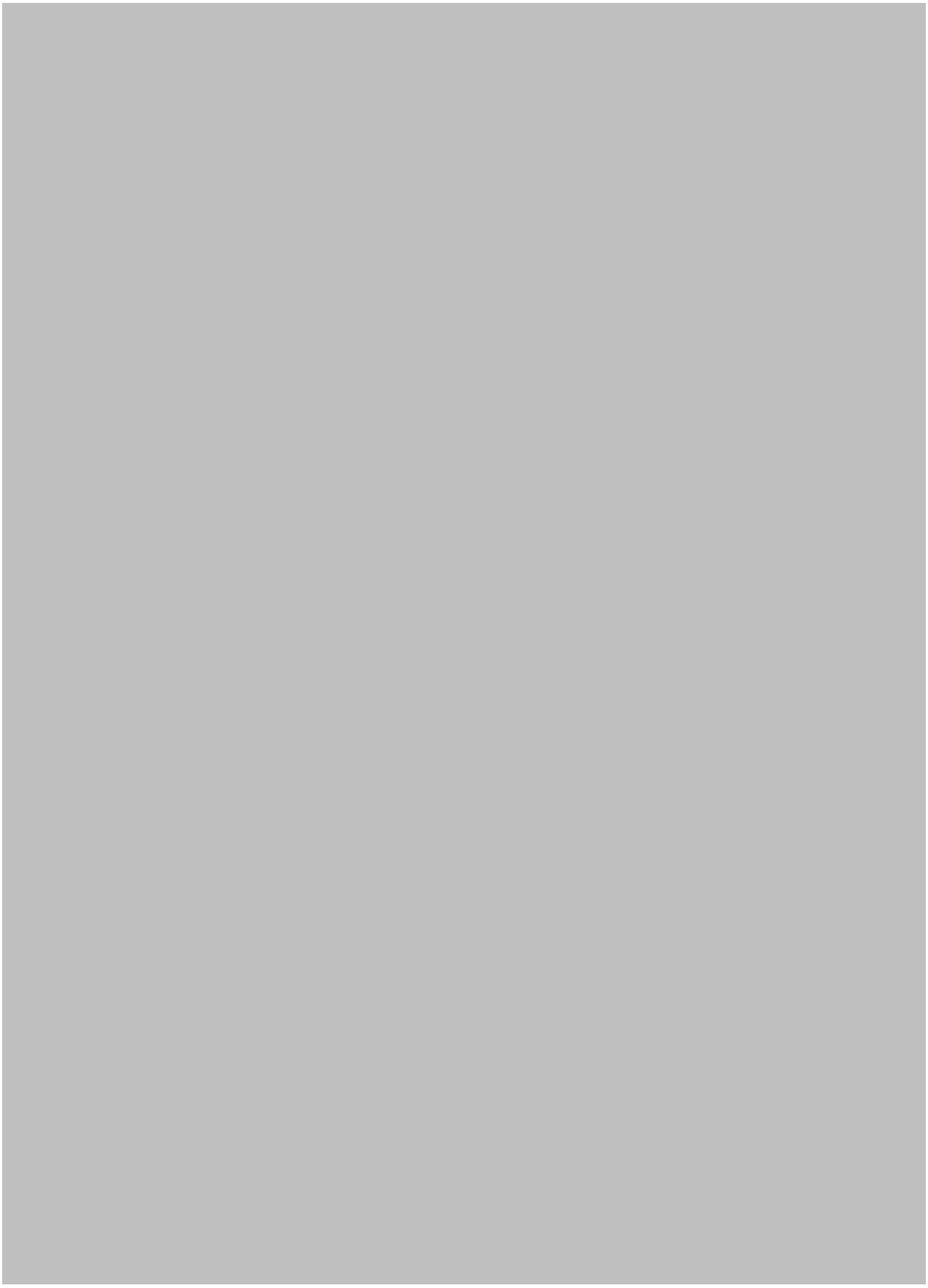
[Revised & Successful - April 14th, 2007]

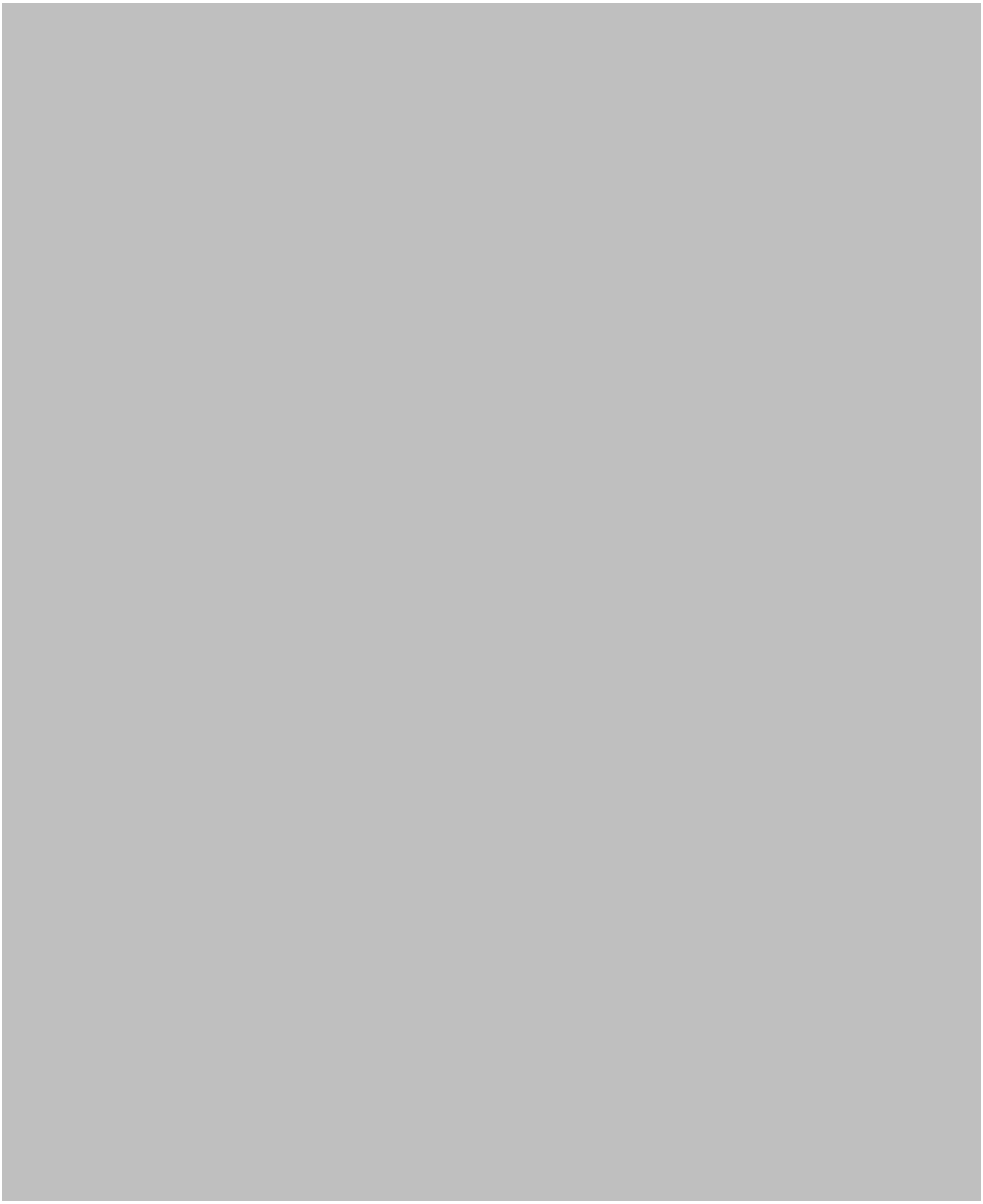


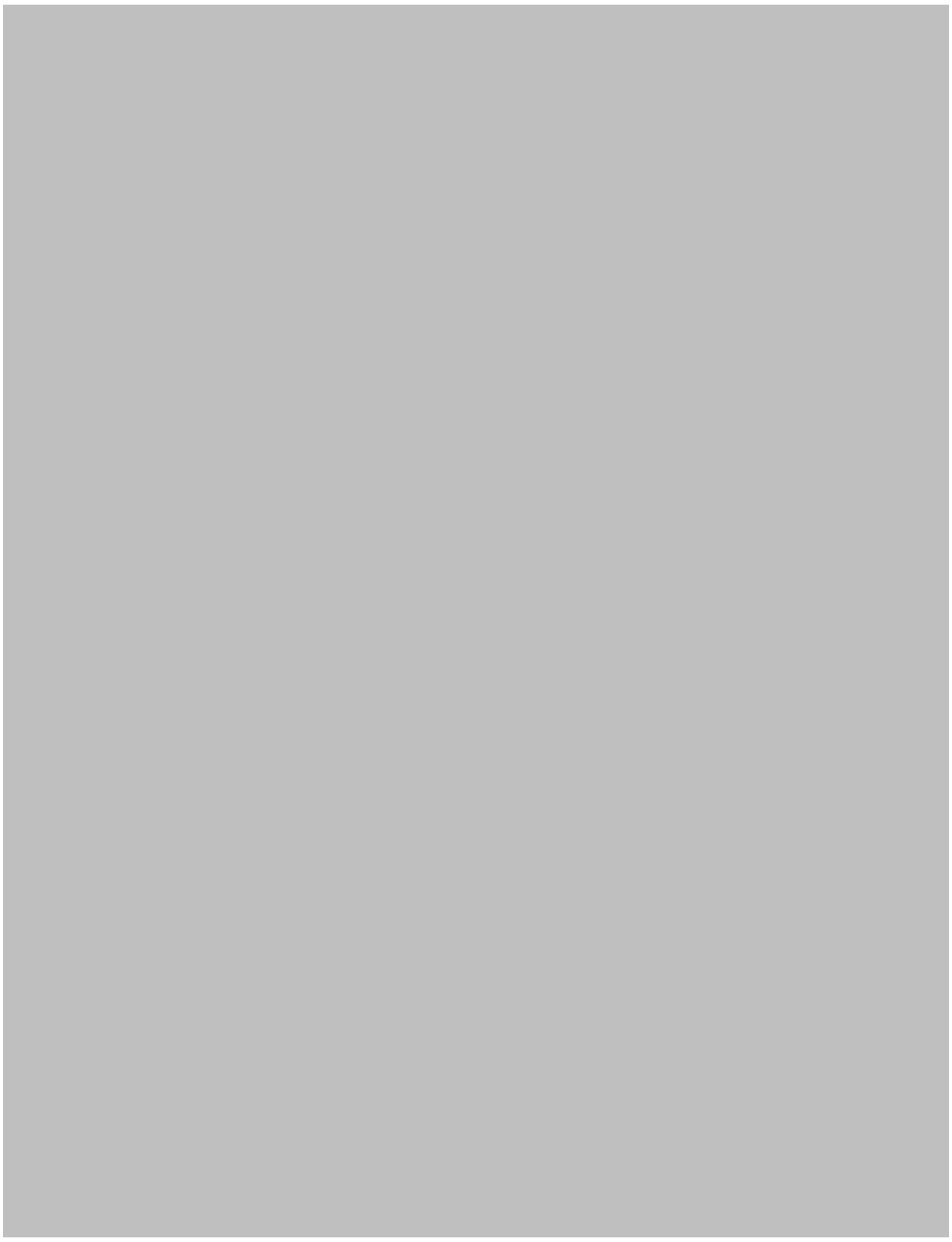


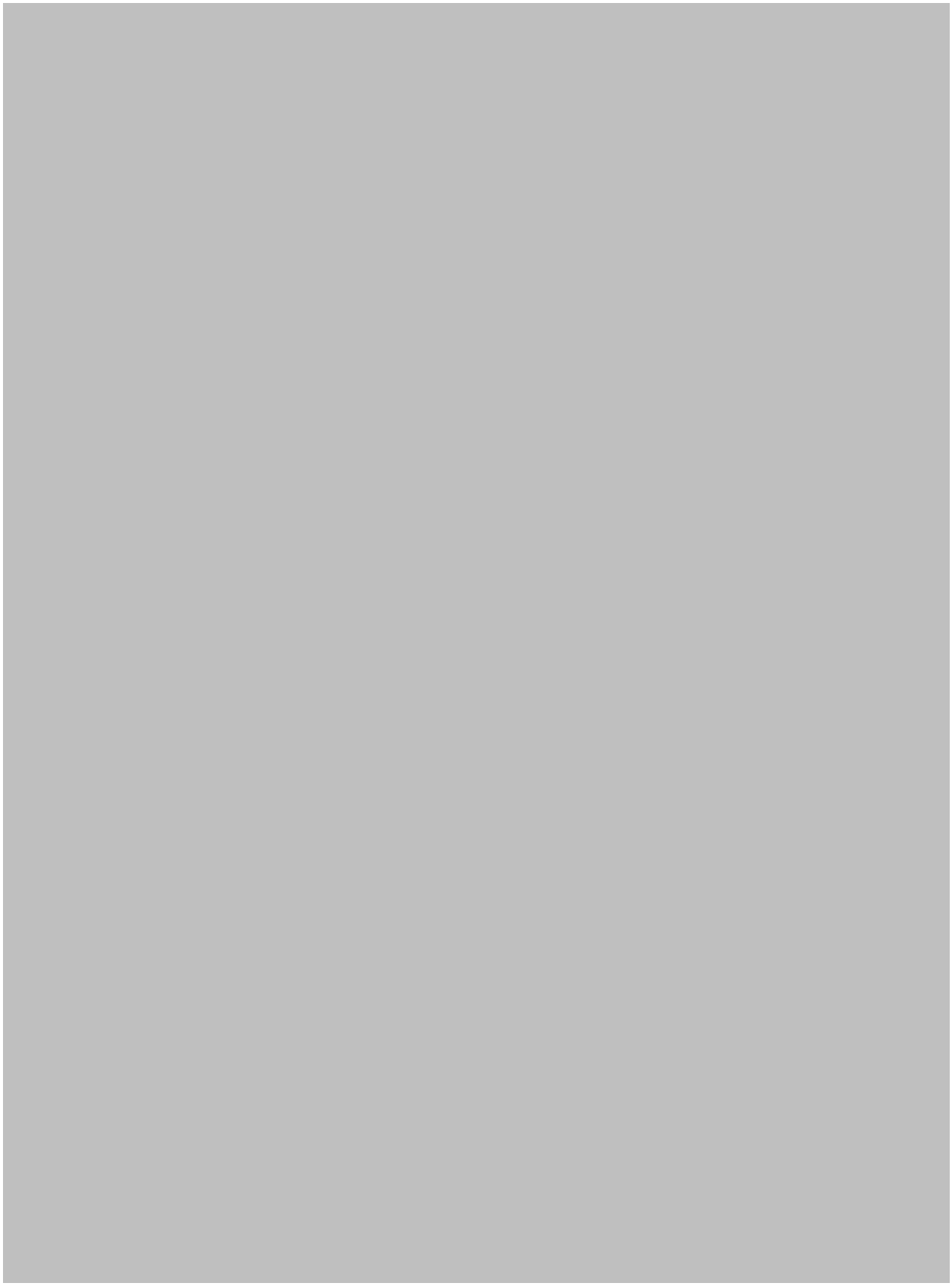


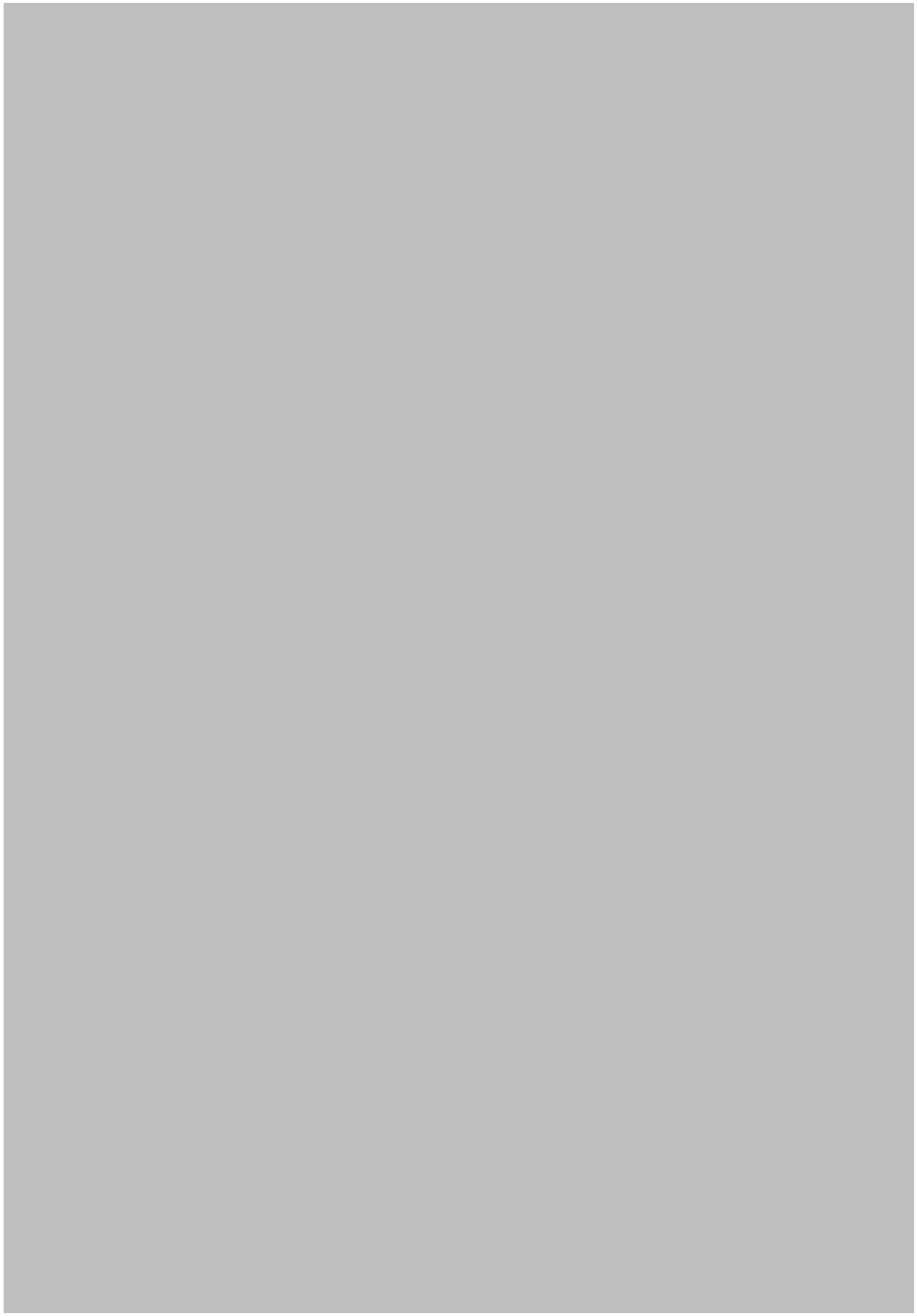


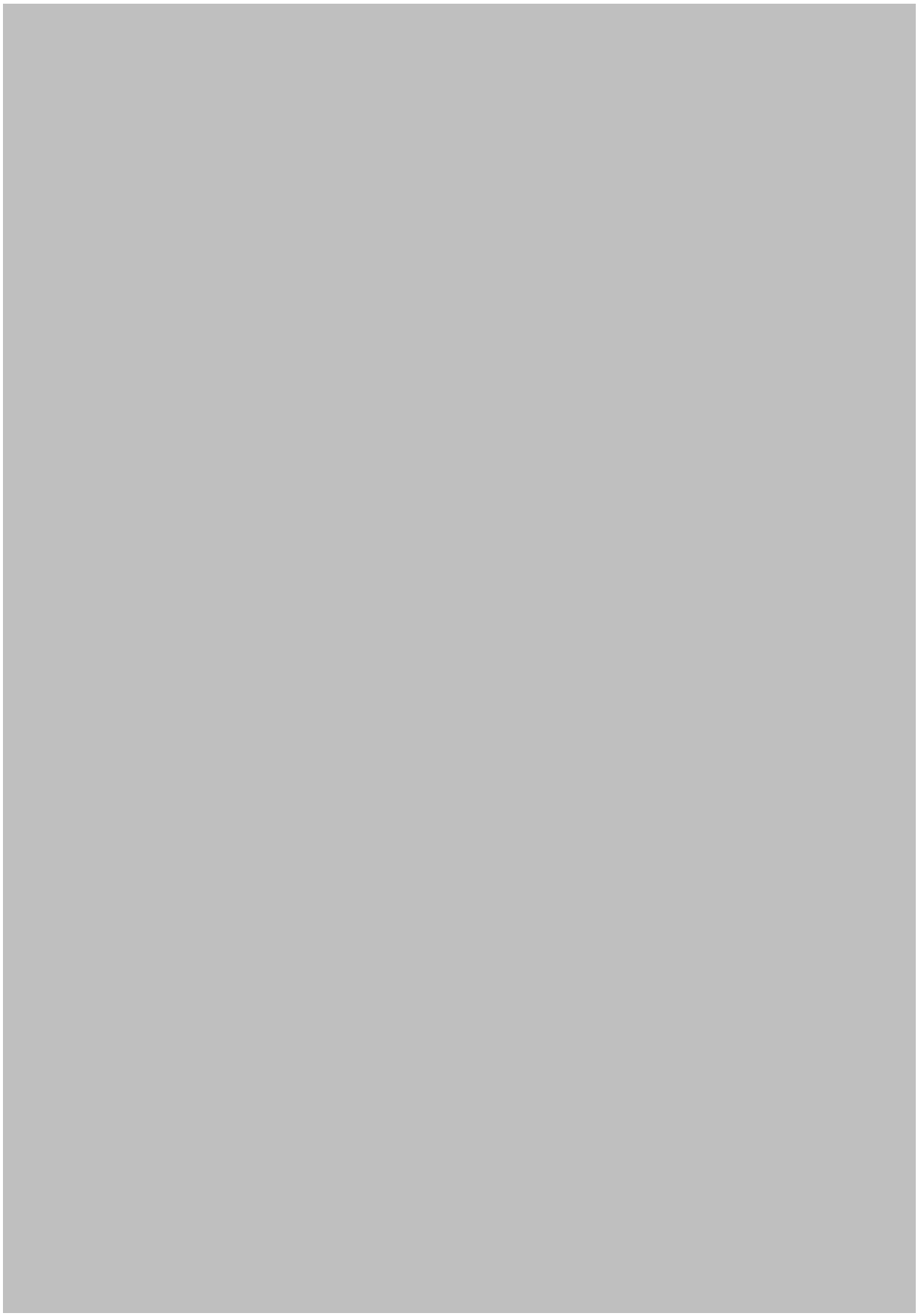


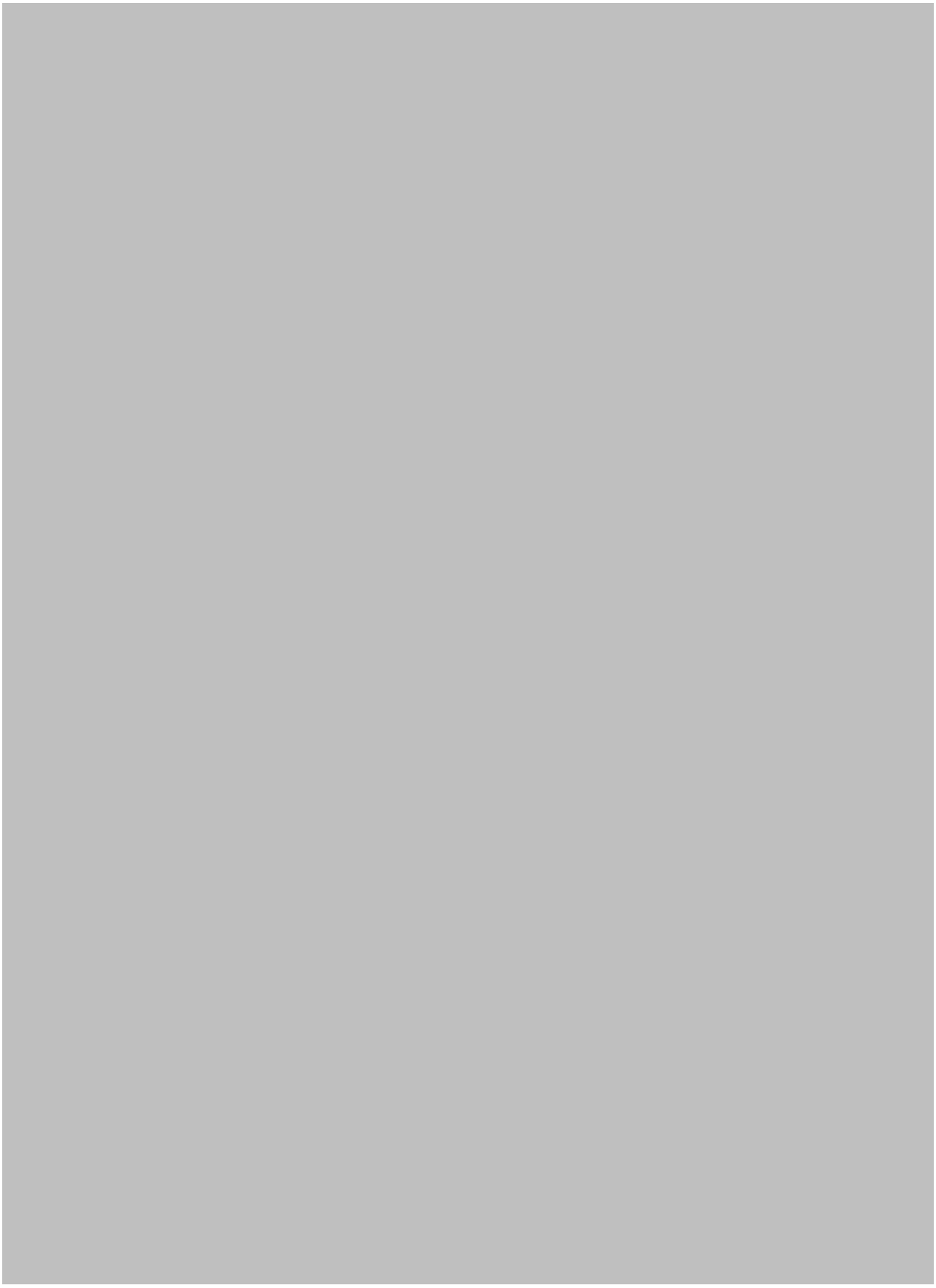


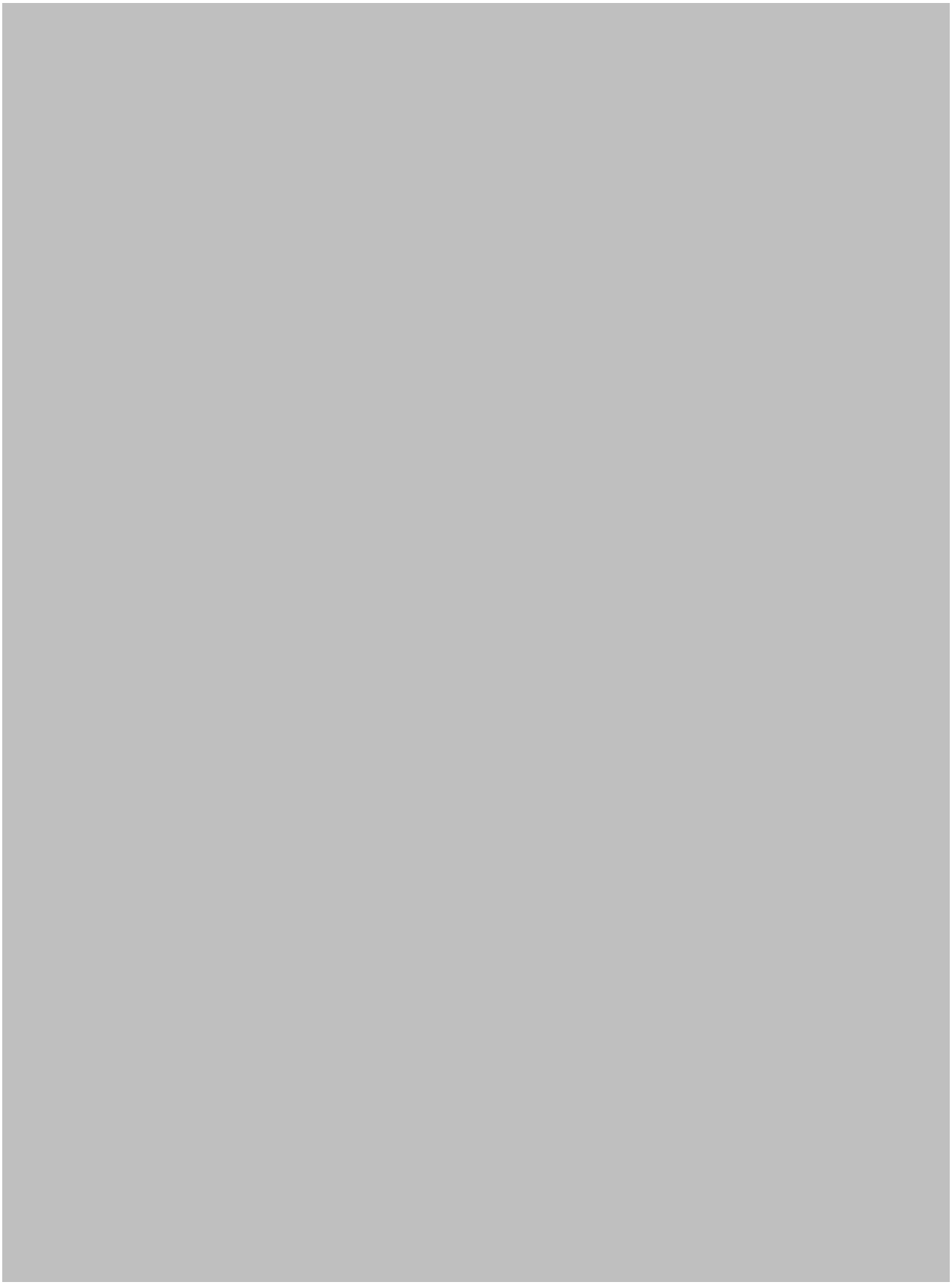


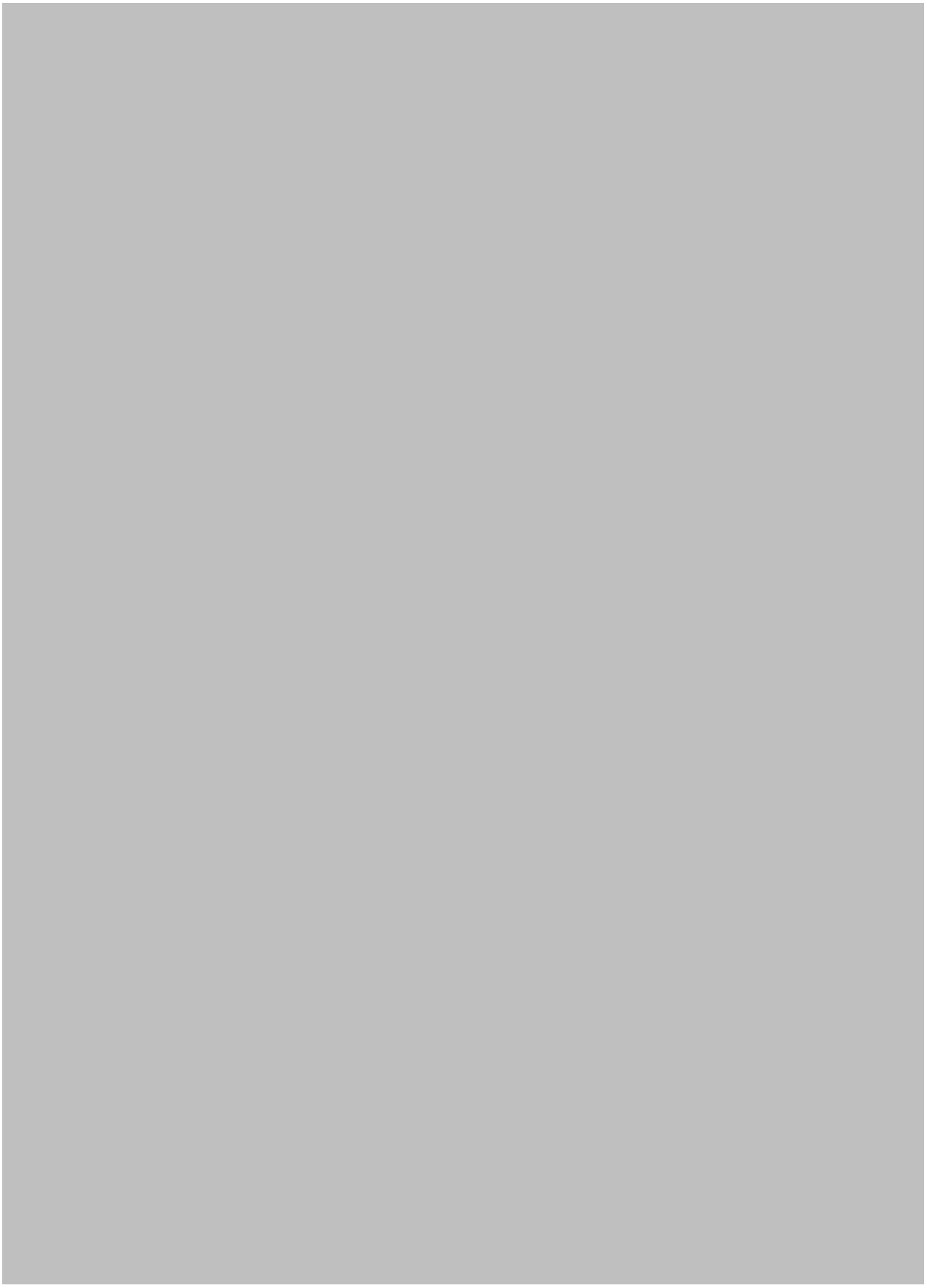


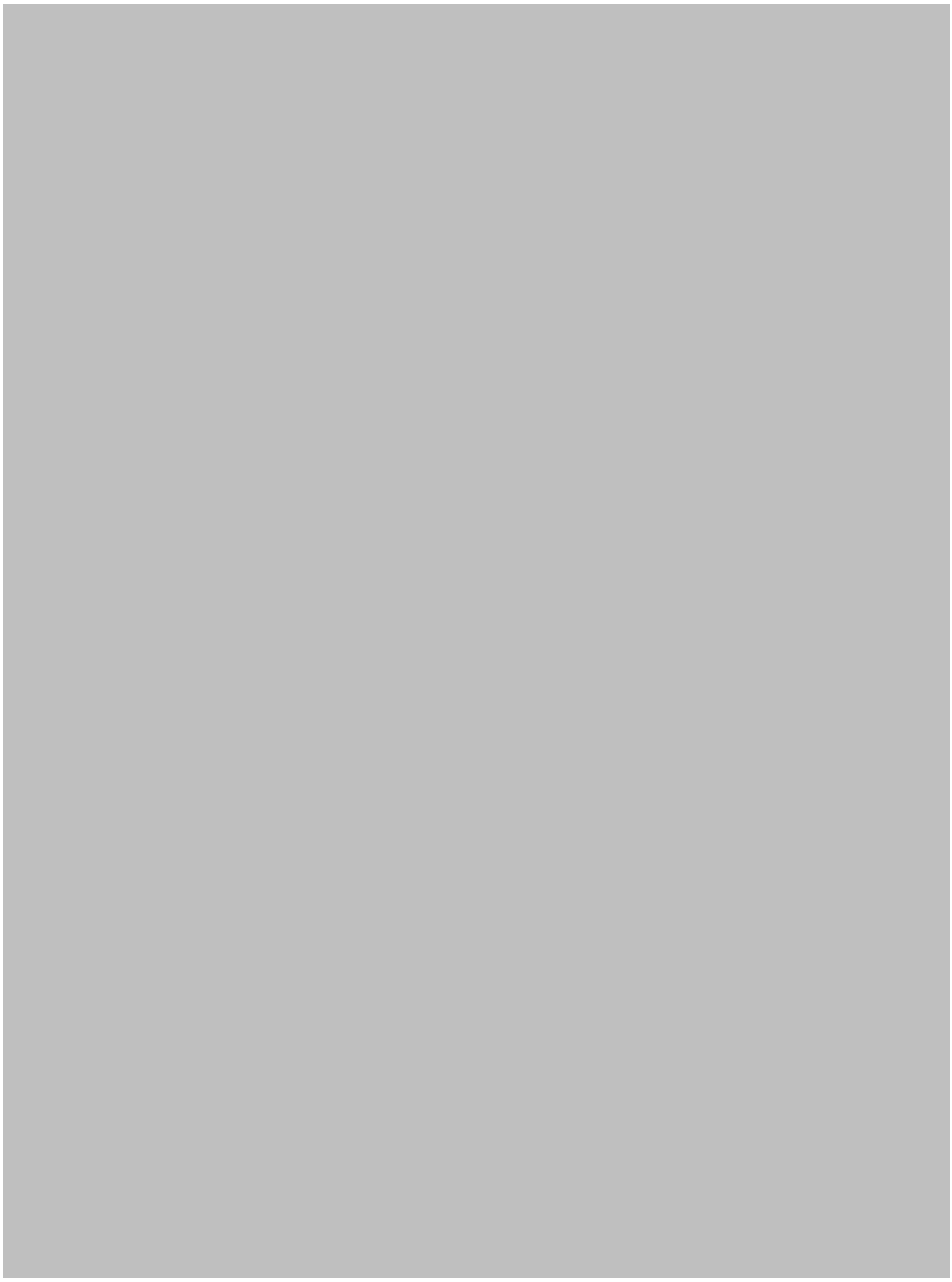


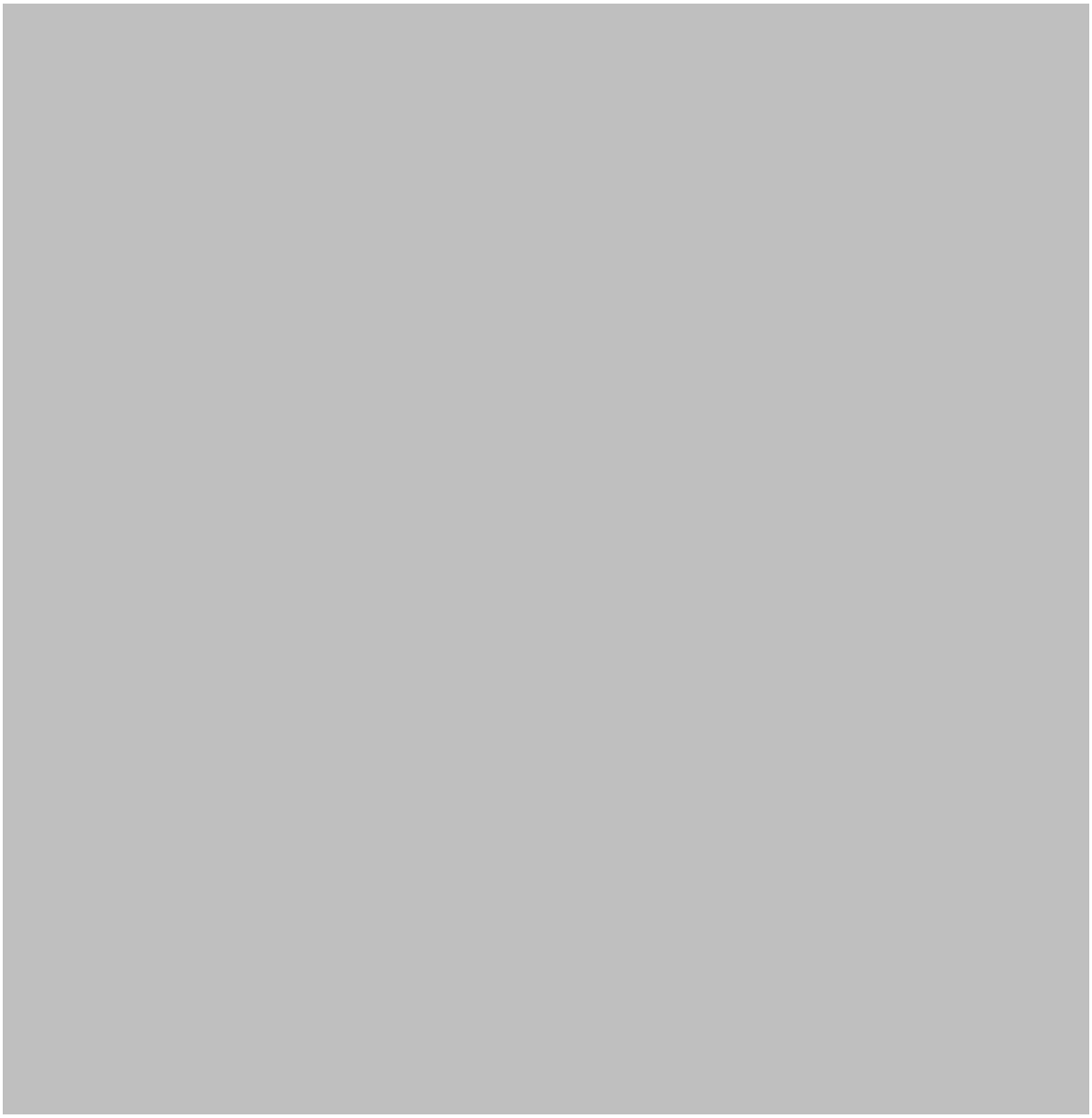












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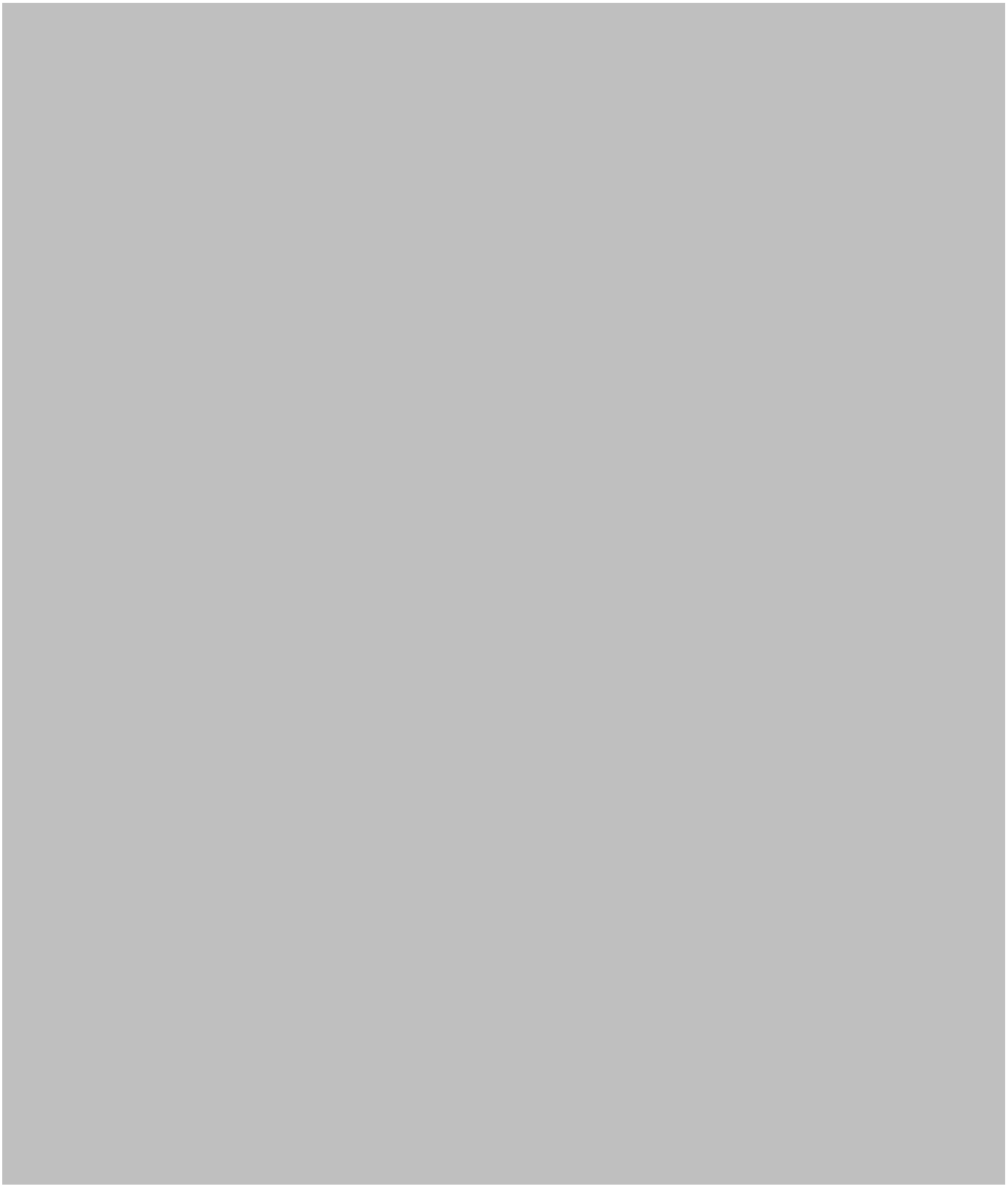

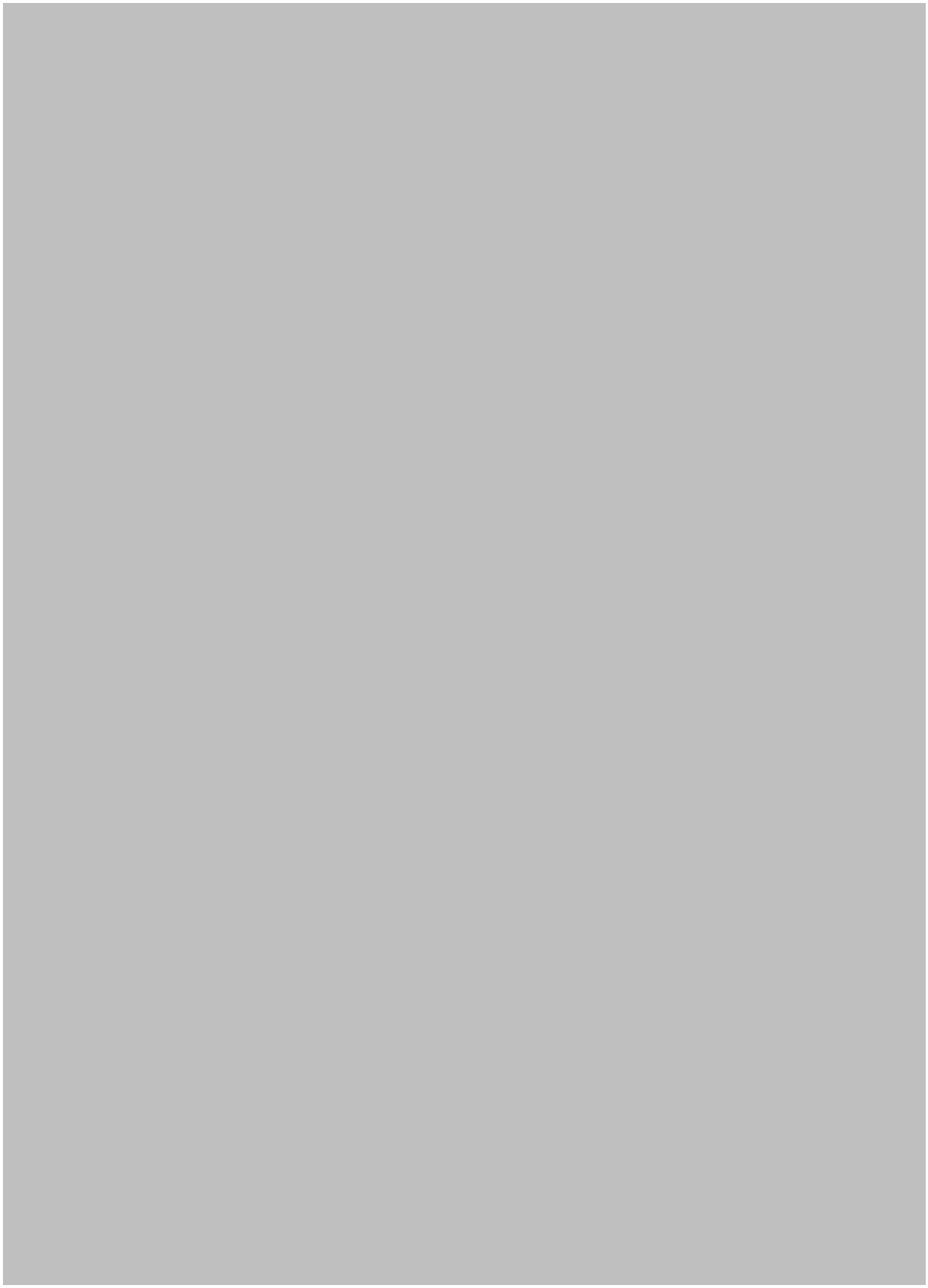

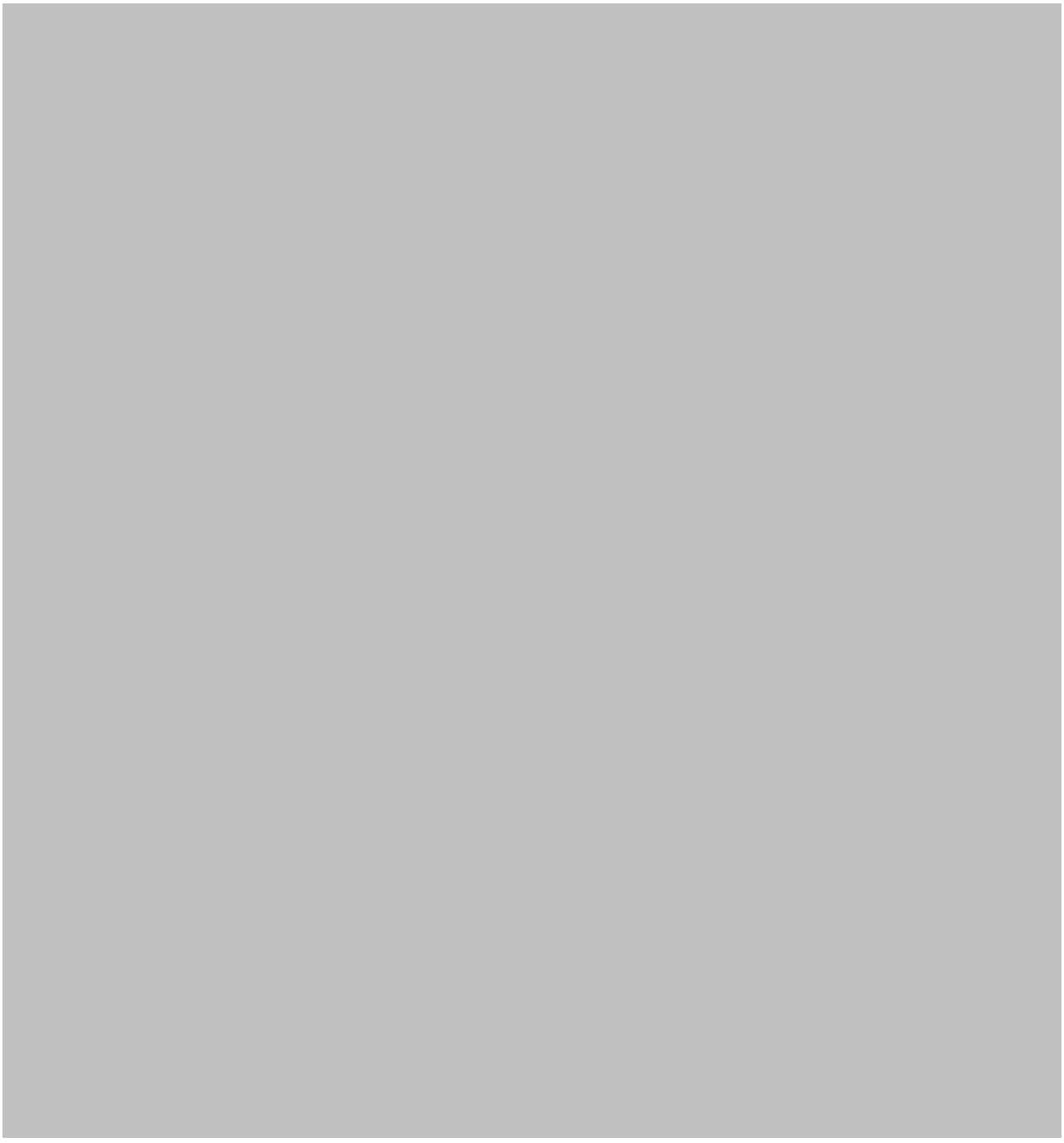

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