

A Systematic Review of Evolutionary-Based Conceptualisations of Family Violence and the
Development of an Alternative Motivational-Emotional Systems Approach

By

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Abstract

Evolutionary psychology is a field that provides distal explanations of behaviour. Although it has potential to enhance current understandings of family violence, the present state of the literature is conceptually messy. The aim of the current thesis was to bring coherence to this domain by conducting a systematic review of evolutionary conceptualisations of family violence over the past four decades. Four databases (PsycINFO, PsycArticles, ProQuest Central, and Web of Science) were searched using relevant search terms to identify any work that examined family violence from an evolutionary perspective. A total of 54 publications were included in the review, ranging from theoretical pieces and empirical studies through to several commentaries. Findings indicated family violence was conceptualised as an adaptation, by-product, or pathology. However, numerous authors had contradictory perspectives as to how certain offences should be conceptualised, others failed to make a conceptual claim at all, and there was a tendency among authors to describe the *behaviour* as an adaptation rather than the underlying *psychological mechanisms*. To make sense of the findings, six recurrent themes were developed: lack of resources, genetic relatedness as a protective factor, fast life history strategy, reproductive value, lethal violence as pathology, and male sexual and familial proprietariness. The second aim of the thesis was to develop a novel theoretical framework that conceptualised family violence in a more clear and coherent manner. This new model was labelled the Fundamental Motives Framework and mapped findings from the systematic review onto a range of motivational-emotional systems. The Fundamental Motives Framework was discussed as a promising way of providing a multi-faceted, coherent perspective of family violence that accommodates for the heterogeneity in offending. Limitations and directions for future research were also discussed.

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Chapter One: Introduction

Families hold a paradoxical position in the modern world (Levesque, 2001). Often perceived as a loving and safe haven, family is viewed by some as the primary source of their social, emotional, and economic support (Barnett et al., 2005; Levesque, 2001; Moulds et al., 2016). Idealised views of family life suggest it should be based on supportive relationships that are relatively immune to conflict and violence (Barnett et al., 2005). This makes the concept of family violence a paradoxical phenomenon (Tolan et al., 2006). However, conflict within the family is a common feature of daily life worldwide. In 2017, more than 50,000 women across the globe were intentionally killed by intimate partners or other family members (United Nations Office on Drugs and Crime [UNODC], 2019). This means that 137 women across the world are killed by a member of their own family every day (UNODC, 2019).

Given the ubiquity of family violence (and crime in general), it is likely that to some extent it has an evolutionary basis (Brown, 1991). This has led to the development of cross-disciplinary research, in which academics from domains such as criminology and forensic psychology have begun to draw on evolutionary theory to enhance current understandings of criminal behaviour (Duntley & Shackelford, 2008).

Evolutionary psychology uses an adaptationist approach to examine the cognitive foundations of behaviour (Duntley & Shackelford, 2008). A central assumption to this approach is that human characteristics can be understood as the product of evolutionary processes (Durrant & Ward, 2015). These characteristics are viewed as adaptations that have been forged during the course of evolutionary history by the forces of natural and sexual selection (Durrant & Ward, 2015). Just as processes of selection have undoubtedly shaped physiological adaptations with certain problem-solving functions, these processes have also influenced humans' thoughts, attitudes, emotions, and preferences to facilitate behaviour

toward solving problems that have recurrently affected individuals' reproductive success (Duntley & Shackelford, 2008). A common perspective among evolutionary psychologists is that crime – or the mechanisms that underlie crime – reflect evolutionary adaptations that may have been selectively advantageous in ancestral environments (Durrant & Ward, 2015). Evolutionary psychology therefore provides distal explanations of behaviour, that help researchers understand *why* a particular part of the human mind may have evolved, and the implications of this within a contemporary context (Buss, 2000).

Although evolutionary psychology holds the potential to enrich contemporary understandings of family violence, the current state of the literature in this domain is large, diverse, and conceptually messy. Therefore, the overall aim of this thesis is to bring some coherence to this domain by conducting a systematic review of evolutionary conceptualisations of family violence. Upon a preliminary scoping review of this literature, it appears there are a variety of evolutionary-based conceptualisations of family violence that fall into three broad perspectives. The first perspective is the conceptualisation of family violence as an *adaptation* that has been specifically selected for. The second is family violence as a *by-product* of adaptations, and the third is that family violence is not adaptive, but rather, is *pathological*. These conceptualisations will be described and explored in greater depth within the review.

This diverse range of perspectives provide rich explanations as to how family violence could be explained through an evolutionary-based point of view. However, there is a lack of coherence as to how these perspectives could fit in with each other and be understood in a more systematic, subjective manner. Although reviews of these explanations exist (Archer, 2012), a systematic review has yet to be conducted. The aim of the current research is to address this gap in the literature by conducting a systematic review of evolutionary-

based conceptualisations of family violence, examining relevant research from the years 1980 to 2019.

The aim of this thesis is two-fold: The first aim is to examine the wide range of different evolutionary approaches to conceptualising family violence, through the means of the systematic review. This will lead on to the second aim of developing a more coherent organisation and conceptualisation of these perspectives through novel theoretical development.

The general layout of this thesis is as follows. Chapter Two provides an overview of family violence to familiarise the reader with the various subgroups of this type of offending and relevant risk factors or patterns in offending. This is followed by a chapter on evolutionary psychology to provide a general description of this field, ways in which it explains patterns in crime from a distal perspective, and relevant explanations of family violence grounded within evolutionary theory. The fourth chapter provides the detailed methodology of the systematic review, which is transparent and objective yet also exploratory by nature. This is followed by a chapter on the results, which are presented in three tables and synthesised to describe six recurrent themes within the literature. The fifth chapter pertains to the second aim of the thesis and presents a novel theoretical approach to conceptualising family violence, labelled the Fundamental Motives Framework. Finally, the last chapter reflects a general discussion. This includes findings from the review, theory development and appraisal of the Fundamental Motives Framework, strengths and limitations of the thesis, implications and recommendations for practice and policy, and avenues for future research.

Chapter Two: Family Violence

Family violence is a serious public health concern that is both complex and heterogenous in nature (UNODC, 2019). The current chapter will provide an overview of family violence and its various subgroups that range from intimate partner, parent to child, child to parent, and sibling violence. In addition, prevalence rates, treatment methods, and relevant risk factors will be examined.

There is much controversy regarding how to define family violence and its components. Definitions should not be restricted to physical violence, as psychological, verbal, sexual, financial, emotional abuse, controlling behaviours, and neglect are also integral to its conceptualisation (Durrant, 2018; Tolan et al., 2006). However, providing a definition that is too broad is also problematic. Some forms of physical aggression (e.g., corporal punishment) are generally not considered family violence, thus a definition is needed that is narrow enough to avoid labelling every family as potentially violent. Levesque (2001) provides such a definition, stating: “family violence includes family members’ acts of omission or commission resulting in physical abuse, sexual abuse, emotional abuse, neglect, or other forms of maltreatment that hamper individuals’ healthy development” (p.13).

There are certain characteristics of family violence that makes it distinct from other forms of violence. Firstly, relationships generally exist prior to, during, and after a violent incident between family violence victims and perpetrators (Durrant, 2018; Tolan et al., 2006). In addition, there are normative forms of violence (such as physically punishing children) that are deemed acceptable to varying degrees by different societies worldwide. Therefore, the legal meaning of violence among family members differs when in the context of non-family members, creating an ambiguous space for violence to occur between family members without any legal consequences (Tolan et al., 2006). These specific complexities of family violence suggest problems such as underreporting are a major issue in this domain. This is

likely to occur due to the ongoing relationship a victim has with a perpetrator, and the decreased clarity as to whether an incident warrants the involvement of law enforcement. Given that family violence is a broad term, the remainder of this section will focus on examining the various forms of violence that it is made up of.

Intimate Partner Violence

Intimate Partner Violence (IPV) is a prevalent form of family violence. IPV is defined by any behaviour within an intimate relationship that causes physical, psychological, or sexual harm to those in the relationship (World Health Organisation [WHO], 2012). This includes acts of physical violence, sexual violence, emotional (psychological) abuse, and controlling behaviours (WHO, 2012). IPV has also been referred to as spouse abuse, marital assault, domestic violence, dating violence, battering, and partner abuse (Durrant, 2018; Wisner et al., 1999). It is difficult to measure IPV, and even more difficult to compare prevalence rates across countries. However, recent self-reported data from population surveys across OECD countries suggest between one quarter and one third of women report having experienced physical or sexual violence by an intimate partner at some point in their lifetime (Breiding et al., 2014; Macy, 2017; Organization for Economic Cooperation and Development [OECD], 2013). Furthermore, these survey-based estimates likely underestimate the extent of the problem due to underreporting by victims who are reluctant to admit abuse and cross-national differences in interviewing and survey methodology (Durrant, 2018; OECD, 2013). There has been ongoing debate in the literature as to whether IPV is a gendered issue primarily affecting females. However, growing evidence suggest male victims experience similar rates of abuse within intimate relationships in Western countries (Archer, 2006; Desmarais et al., 2012; Straus, 2011). Despite this gender parity, women are disproportionately victims of intimate partner homicide, with data from the United Nations showing female victims account for 82% of all victims of intimate partner homicide

(UNODC, 2019). Overall, these findings suggest IPV is complex in nature, and is a major public health concern.

The cost of IPV on society from a health, social, and economic perspective is immense. For example, the National Centre of Injury Prevention and Control in the United States (US) estimated that in 2003, the cost of IPV against women was substantial, with an estimated cost of around 8.3 billion US dollars a year (OECD, 2013). Victims of IPV not only experience a range of physical injuries, but perhaps more commonly they obtain a number of ailments known as ‘functional disorders’. These include irritable bowel syndrome, fibromyalgia, various chronic pain syndromes, and exacerbation of asthma (WHO, 2012). Despite having no identifiable medical cause, these illnesses are often associated with the experience of chronic stress (WHO, 2012). Exposure to IPV also affects children in the household, with one meta-analysis finding children subsequently experience internalising problems, externalizing problems, social problems, academic problems, or negative affect/distress (Heyman et al., 2015). In addition, a co-occurrence between child and partner maltreatment has been established in the literature, suggesting children living in households with IPV present are at increased risk of being abused and neglected (Dixon et al., 2007; Smith et al., 2005). Furthermore, childhood exposure to interparental IPV is related to later IPV perpetration, victimisation, and violence toward one’s own children (Eriksson & Mazerolle, 2015; Heyman et al., 2015). These findings indicate the need for adopting a holistic approach when considering intervention with violent families to address the diverse range of cases and decrease its intergenerational transmission (Dixon et al., 2007). Interventions for IPV perpetrators have currently demonstrated minimal impact on reducing recidivism (Babcock et al., 2004; Gadd, 2004), and programmes that are more tailored to the individuals’ specific needs are recommended to account for the heterogeneity observed in IPV cases (Akoensi et al., 2012).

Research on risk factors for IPV perpetration and victimisation is predominately focused on male perpetrators and female victims. These perpetrator risk factors include unemployment (Capaldi et al., 2012; Durrant, 2018), antisocial personality characteristics (Capaldi et al., 2012; Eriksson & Mazerolle, 2015), alcohol and drug abuse (Capaldi et al., 2012; Glass et al., 2003; Walton-Moss et al., 2005), stress (Capaldi et al., 2012), a history of violence (Walton-Moss et al., 2005), and stalking behaviours (Durrant, 2018; Senkans et al., 2017). Additional risk factors include exposure to IPV in an individual's family of origin and experience of child abuse (Capaldi et al., 2012). A final important risk factor is possessiveness and sexual jealousy, which commonly manifests in controlling behaviours (Capaldi et al., 2012; Glass et al., 2003; Walton-Moss et al., 2005). Although under-researched, a recent systematic review of risk factors for female perpetrators of IPV found associations between IPV and alcohol and drug abuse, exposure to childhood abuse and trauma, attachment issues, and borderline personality traits (Mackay et al., 2018).

A risk factor for female victimisation is being young, with a higher relative risk of violence associated with greater age discrepancies between female and male partners (Durrant, 2018; Shackelford, 2001). In addition, more general relationship risk factors include the presence of stepchildren (Daly et al., 1993), cohabitating rather than being married (Capaldi et al., 2012; Shackelford, 2001) and separation or threat of separation (Capaldi et al., 2012). Finally, low levels of gender empowerment and attitudes towards women is a societal risk factor for violence against women in intimate relationships. Nations with more sexist attitudes and greater gender inequalities are associated with relatively more female as compared to male victims of IPV (Archer, 2006; Durrant, 2018).

Child Abuse

Child abuse is recognised internationally as a serious public health, human rights, legal, and social issue (Chan, 2012). Child abuse is defined as any act of commission or

omission that impairs or endangers a child's physical or psychological health or development (Chan, 2012). Abuse can range from physical abuse, child neglect, sexual abuse, psychological abuse, educational neglect, to a child's commercial or other exploitation (Chan, 2012; Durrant, 2018). Prevalence rates vary, however recent population-based data from approximately half of the countries in the world found that over 1 billion children aged 2-17 years experienced violence in the past year (Hillis et al., 2016). The most extreme form of child abuse is child homicide, and includes neonaticide, infanticide, and filicide.

Neonaticide refers to the killing of an infant in the first 24 hours after birth. Infanticide is the killing of young children, and filicide is a more general term for the killing of a child by a parent or caregiver (Durrant, 2018). Neonaticide is primarily perpetrated by women, however as children grow older fathers are more likely to commit filicide than mothers (UNODC, 2019). Capturing accurate rates of neonaticide is difficult, as the death of a new-born often goes unreported and small corpses are easily disposed of (UNODC, 2019). However in general, child homicide by a parent is relatively rare, with estimated incident rates for filicide in Western countries ranging from 2.1 per 100,000 to 6.9 per 100,000 (Durrant, 2018; Porter & Gavin, 2010).

Understanding why intra-familial child abuse occurs is complex. Various explanations in the literature include violent parental attitudes, clear or borderline mental health issues, the culmination of interpersonal conflicts and psychological stress/unhappiness (Chan, 2012; UNODC, 2019) Given that IPV has been found to co-occur with child abuse, female perpetrators may commit forms of child abuse such as neonaticide after experiencing a sense of helplessness and inability to endure further abuse and harassment from their partner (UNODC, 2019). Higher rates of abuse and homicide toward stepchildren is also a pattern that has been observed in the literature (Archer, 2012; Wilson et al., 1980). This is hypothesised as the consequence of a weaker attachment bond between a child and their

stepparent, with evidence indicating stepparents put less parental feeling and investment into their stepchildren (Archer, 2012). From an evolutionary perspective it is predicted that conflict will occur when a stepparent has to care for unrelated kin, given this provides them with no observable fitness benefits (Emlen, 1997). In addition, stepfathers have been found more likely to beat their child to death, whereas genetic fathers are more likely to use methods such as suffocation or drowning and subsequently commit suicide themselves (Daly & Wilson, 1994; Harris et al., 2007; Weekes-Shackelford & Shackelford, 2004). These different patterns in their behaviour suggest different motivational pathways. Interventions need to cater for the heterogeneity observed among child abuse perpetrators, with the utilisation of evidence-based strategies such as teaching positive parenting skills and empowering families economically (Hillis et al., 2016).

Risk factors for child abuse perpetration include unemployment (Rittner, 2002), alcohol and drug abuse (Black et al., 2001), stress (Archer, 2012; Black et al., 2001), living with non-genetic kin (Archer, 2012), emotional behavioural problems/dysphoria (Durrant, 2018; Hindley et al., 2006), and conflict with one's partner (Hindley et al., 2006). Gender differences demonstrate a risk factor for male perpetrators of child abuse is having a history of antisocial behaviour. Contrastingly, women predominately commit neonaticide, and risk factors include being young, unmarried, socially disadvantaged, and unemployed (Durrant, 2018).

Age is a risk factor for victims of child abuse. Children are at highest risk early in life, with a declining risk thereafter (Archer, 2012). Other risk factors are being male (although child sexual abuse is associated with greater risk for girls; Durrant, 2018), having a disability (Stalker & McArthur, 2012), and behavioural problems such as attentional deficits and socialised aggression (Black et al., 2001). Important social risk factors include living in

disadvantaged/impoverished communities (Archer, 2012; Black et al., 2001), poverty (Archer, 2012), and social isolation (DePanfilis & Zuravin, 1999).

Child-to-Parent Violence

Child-to-Parent Violence (CPV) is one of the most neglected forms of family violence (Coogan, 2011; Moulds et al., 2016). It is considered the least likely form of family violence to be reported and the least well understood (Moulds et al., 2016). CPV is defined by Cottrell (2003) as “any harmful act by a teenage child intended to gain power and control over a parent. The abuse can be physical, psychological, or financial” (p.1). One barrier to understanding CPV is the widely held belief that parents are responsible for their children’s behaviour, even if it is to their own detriment (Barnett et al., 2005; Moulds et al., 2016). This leads parents to minimise and make excuses for the abuse they experience, which in turn makes it more difficult to determine the scope of the problem. Although prevalence rates are hard to accurately gauge, international estimates suggest that up to one in 10 parents will experience CPV (Cottrell & Monk, 2004; Moulds et al., 2016). A pattern in CPV that is similar to other forms of family violence is the cyclical nature of the abuse (Moulds et al., 2016). A large majority of young people who perpetrate violence towards their parents have witnessed family violence themselves, and many have been a victim of physical abuse (Routt & Anderson, 2011). This intergenerational pattern of victimisation highlights the importance of effective multilevel interventions that breaks the cycle of abuse. Educational and school-based interventions for preventing CPV have been rated as relatively ineffective, suggesting researchers need a greater understanding of CPV before effective treatment can be provided (Fellmeth et al., 2019; Moulds et al., 2016).

There are numerous risk factors for perpetrators of CPV. These include being male (Ibabe et al., 2013), alcohol and drug use (Moulds et al., 2016), social maladjustment and deficits in emotion control, impulse control, and coping skills (Ibabe et al., 2013; Moulds et

al., 2016). Other risk factors are psychological disorders such as schizophrenia or bipolar disorder (Ibabe et al., 2013; Moulds et al., 2016), childhood behavioural patterns of aggression at school (Coogan, 2011; Pagani et al., 2009), antisocial peers who use violence at home (Moulds et al., 2016), and witnessing or experiencing domestic violence (Coogan, 2011).

A risk factor for CPV victimisation is being female, with estimates suggesting up to 80% of all cases are mothers (Coogan, 2011; Ibabe et al., 2013). Other risk factors include being a single parent or in a step-parent household (Moulds et al., 2016), previous IPV victimisation (Moulds et al., 2016), stress (Moulds et al., 2016), and parenting style such as permissive or authoritarian that repeatedly demonstrates inconsistent rules and consequences (Cottrell, 2003; Moulds et al., 2016). A more general relationship risk factor is a lack of warmth or attachment in the parent-child relationship (Cottrell, 2003).

Elder Abuse

Elder abuse is a variation of CPV, and has similarly received little attention in the literature. It is defined as “a single or repeated act or lack of appropriate action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person” (WHO, 2002, p.126). In most cases the older person has a diminished capacity for self-care and self-protection and is reliant on a family member to support them (Chan, 2012). Such abuse can be divided into the following categories: physical abuse, sexual abuse, emotional abuse, financial abuse or material exploitation, neglect, and abandonment (Chan, 2012). Prevalence rates vary widely across different countries due to studies employing different populations, measures, and definitions of abuse (Cooper et al., 2008). For example, a systematic review of elder abuse worldwide found prevalence of abuse reported in general population studies ranged from 3.2% to 27.5% (Cooper et al., 2008). In New Zealand, the organisation Age Concern worked with 975 older clients who had

experienced abuse or neglect between 2002 and 2004 (Clearinghouse, 2007), while a study in the US estimated prevalence rates at 10% among an aging population (Macy, 2017).

Risk factors for being abused include being socially isolated or functionally impaired, while perpetrators of elder abuse are more likely to be suffering from stress, have a history of violence, and have substance abuse problems (Durrant, 2018; Tolan et al., 2006). It is unclear whether interventions for elder abuse are effective due to few studies actually measuring subsequent abuse as an outcome (Tolan et al., 2006). For example, Reay and Browne (2002) found an education-based intervention led to significant reductions in strain, depression and anxiety for perpetrators of elder abuse, however rates of subsequent abuse were not identified. More research is needed to develop an evidence-based approach for ameliorating this form of family violence.

Sibling Abuse

Sibling abuse is a common yet under-researched phenomenon. It is difficult to define such violence as one must first determine the point at which normal developmental behaviour between siblings end and abuse begins (Kiselica & Morrill-Richards, 2007). Factors such as the intent, constancy and severity of an act, and the emotional impact on the victim need to be considered when determining whether it is abusive (Kiselica & Morrill-Richards, 2007). Prevalence rates appear high, with estimates across Europe and the US at approximately 75% for physical and psychological violence (Gan & Tang, 2020; Hardy et al., 2010; Relva et al., 2013). A study of sexual violence found 10 – 15% of college students reported experiencing unwanted sexual contact with a sibling when they were younger (Finkelhor, 1980). Violence between siblings tends to be mutual (Hardy et al., 2010), which exacerbates the issue as it is perceived by parents as normative conflict that requires no intervention. Despite the dominant discourse in society that downplays the seriousness of sibling violence, the damaging effects of sibling abuse are well-documented. Negative outcomes among victims include low self-

esteem, anxiety, depression, and difficulty in social adaptation (Cater et al., 2014; Desmarais et al., 2012; Gan & Tang, 2020). Sibling violence must stop being overlooked by researchers and community members to ensure both victims and preparators receive the attention they need.

Risk factors for sibling abuse perpetration include antisocial behaviour/conduct disorder (Kiselica & Morrill-Richards, 2007), alcohol and drug abuse (Kiselica & Morrill-Richards, 2007), caretaking responsibilities for fellow younger siblings (Hoffman & Edwards, 2004), and witnessing or being victim of domestic violence (Button & Gealt, 2010; Hoffman & Edwards, 2004). A risk factor for victims of sibling abuse is physical and intellectual disabilities. In addition, victims tend to be dependent on the perpetrator (Kiselica & Morrill-Richards, 2007). Risk factors for both perpetrators and victims include developmental delays in cognitive functioning, emotional maladaptation, depression, aggression, apathy, and social isolation (Kiselica & Morrill-Richards, 2007). Heightened risk for sibling violence is observed in families where there is a normalisation of abuse by parents, and a family structure that supports power imbalance, differential treatment of siblings, patriarchal values, rigid gender roles, lack of parental supervision, and child neglect. (Hoffman & Edwards, 2004; Kiselica & Morrill-Richards, 2007).

Summary

Despite the large amount of love and loyalty observed within families, much conflict and violence also occurs. There are various salient and reoccurring aspects of family violence that require deeper explanation. These include the high rates of violence among genetically unrelated families, the cyclical nature of abuse, and the gender parity of IPV perpetration rates in Western countries. Numerous explanatory targets are observed in the reviewed literature, all of which are summarised in Table 1. Evolutionary psychology provides an avenue to examine these explanatory targets in terms of their evolutionary function and

evolutionary history. This will be explored further in subsequent chapters. Finally, effective treatment is needed that accounts for the heterogeneity within family violence, addressing the case-by-case needs of the affected individuals within the context of their families and communities. Treatment efficacy has room for improvement across all forms of family violence, demonstrating the need for more multilevel research to facilitate this.

Table 1*Key Explanatory Targets for the Explanation of Family Violence*

Key explanatory targets	
<i>Intimate Partner Violence (IPV)</i>	Women in Western countries perpetrate IPV at similar rates as male perpetrators. However, women are more likely to experience severe consequences of IPV, such as intimate partner homicide.
<ul style="list-style-type: none"> Gender parity in Western countries 	
<ul style="list-style-type: none"> Male perpetrators are characterised by sexual jealousy 	A major motivation for male perpetrators of IPV is sexual jealousy. This often manifests in coercive and controlling behaviours by male perpetrators.
<ul style="list-style-type: none"> The presence of stepchildren is associated with higher IPV rates 	The presence of stepchildren increases the rate of IPV perpetration within households.
Victims at greater risk when they are:	Female victims of IPV are at increased risk when they are young, when there exists a large age discrepancy with their partner, and when they have separated or have threatened to separate.
<ul style="list-style-type: none"> Young At a greater age discrepancy with partner Separated or have threatened to separate 	
<i>Child Abuse</i>	
<ul style="list-style-type: none"> Perpetrators of child abuse have characteristics that vary dependent on the age of the child 	Women are more likely to be perpetrators of CPV or filicide when their child is still a baby or very young. Men are more likely to be perpetrators as their child gets older and becomes a teenager.
<ul style="list-style-type: none"> Perpetration is associated with social disadvantage 	Perpetrators often live in contexts of social disadvantage, such as being unemployed.

Victims at greater risk when they are:

- Young
- A non-genetic child
- Have a disability or impairment

Victims of child abuse are at increased risk when they are young, a stepchild, or possess some form of disability or impairment.

Child to Parent Violence (CPV)

- CPV is patterned by sex
- Perpetrators have been witnesses or victims of abuse themselves, as is the case for victims
- Victims are often single parents or in stepparent relationships

Boys are more likely to be perpetrators of CPV than girls, while mothers are more likely than fathers to be victims.

CPV perpetration is associated with a history of witnessing abuse in the family and/or being victim of abuse. Victims of CPV are at increased risk of previous IPV victimisation.

Characteristics of CPV victims include being a single parent or in a stepparent relationship and being aged around 40 to 50 years old.

Elder Abuse

- Victims of elder abuse are characterised by numerous vulnerabilities

Victims of elder abuse tend to be dependent on their perpetrator and are often socially isolated and/or functionally impaired.

Sibling Abuse

- Sibling abuse is patterned by sex and age
- Perpetrators have been witnesses or victims of abuse themselves
- Victims at greater risk when they are functionally impaired
- Maladaptive family norms strongly influence sibling abuse likelihood

Boys are more likely to be perpetrators of sibling violence than girls. In addition, perpetrators tend to be the older sibling who has caretaking responsibilities for the victim.

Similar to other forms of family violence, perpetrators have high rates of witnessing or experiencing abuse themselves.

Victims of sibling abuse are at increased risk when they have physical or intellectual disabilities and generally 'difficult' temperaments.

Maladaptive family norms increase the rates of sibling violence. These include the normalisation of abuse by parents, rigid gender roles, differential treatment of children, and a lack of parental supervision and child neglect.

Chapter Three: Evolutionary Psychology

Evolutionary psychology is a scientific field that examines the influence of selection and other evolutionary forces on human psychology (Lewis et al., 2017). The theory of evolution provides a framework for understanding various distal causal processes responsible for creating the human brain and mind (Lewis et al., 2017). This chapter explores evolutionary psychology and how it is applied to crime. This will begin with an initial review of evolutionary theory and general evolutionary psychology. Following on from this will be an exploration of patterns in crime explained from an evolutionary perspective. Finally, key concepts and theories relevant for understanding family violence within an evolutionary framework will be reviewed.

Evolutionary Theory

To gain a complete understanding of evolutionary psychology, it is necessary to touch on evolutionary theory itself. Evolution is simply change over time, and the driving force behind this change is the process of natural selection (Shackelford & Liddle, 2014). Darwin's (1859) theory of evolution by natural selection is best understood through three integral principles: phenotypic variability, differential fitness, and heritability (Crawford & Krebs, 2013). Phenotypic variability refers to the fact that among all sexually reproducing organisms there is variation in their traits, ranging from their physical, psychological, and behavioural characteristics (Crawford & Krebs, 2013). This variation leads to differential fitness, in which certain traits are associated with greater survival and reproductive success. If these fitness-promoting traits are heritable, they then become increasingly common within a population as they are selected for, whilst less desirable traits become less common as they are selected against (Durrant, 2018; Lewis et al., 2017). Any characteristic produced by natural selection is known as an *adaptation*, as it has been selected for based on its survival and reproductive benefits. Organisms therefore develop and change gradually over time through the non-

random selection of random genetic variants that are associated with increased fitness (Shackelford & Liddle, 2014).

Another important concept developed by Darwin is the theory of sexual selection (Rubenstein, 2012). Sexual selection involves two main processes: mate choice and same-sex competition (Durrant, 2018). Mate choice is based on the idea that male and female members of particular species possess distinct preferences in their choice of mates based on their physical, psychological, and behavioural characteristics (Buss & Schmitt, 2019; Siegert & Ward, 2002). A classic example is the peacock's elaborate plumage, which provides no functional advantage to a peacock's survival in and of itself (Shackelford & Liddle, 2014). However, this characteristic has evolved due to peahens' preferences to mate with males who show the most brilliant plumage, which is likely an indicator of good health and low parasite load (Buss, 2009). Same-sex competition on the other hand, is the prediction that certain characteristics such as aggression or physical competition with rivals will be selected for if these characteristics are associated with gaining preferential sexual access to the opposite sex (Buss, 2009). Same-sex competition tends to occur more among males than females and has been used to explain sexual dimorphism and the widespread prevalence of male-male aggression (Puts et al., 2015). However, there is substantial within and between species variation in intra-sexual competition (Clutton-Brock, 2017; Janicke et al., 2016; Puts et al., 2015).

Evolutionary Psychology

Evolutionary psychology is made up of a number of key elements. Firstly, evolutionary psychologists' primary focus is on identifying the psychological adaptations that have evolved to solve problems related to survival and reproduction (Confer et al., 2010). The assumption here is that just as physiological adaptations undoubtedly provide insight into the specific problems they are designed to solve, so do psychological adaptations (Confer et

al., 2010). Psychological adaptations are referred to by Confer et al. (2010) as “information-processing circuits that take in delimited units of information and transform this information into functional output designed to solve a particular adaptive problem” (p. 111). The focus of evolutionary psychology on *psychological mechanisms* as the main unit of analysis rather than *behavioural patterns* is hypothesised to provide more causal accuracy as it decreases the number of confounding environmental variables that influence an individual’s behaviour (Durrant & Ward, 2015). Finally, evolutionary psychologists have the difficult task of identifying whether an observable psychological mechanism can be classified as naturally selected feature (adaptation) or whether it is a by-product of an adaptation or is simply a residue of noise (Buss et al., 1998; Confer et al., 2010). A further description of each conceptualisation is provided below.

Adaptation

Adaptations have been specifically selected *for*. An adaptation is considered an inherited and reliably developing characteristic that is a feature of a species developed through natural selection due to its ability to directly or indirectly facilitate reproduction during the time of its evolution (Buss et al., 1998). Adaptations are distinguished by evidence of *special design*, which include complexity, efficiency, economy, precision, reliability, and functionality (Buss et al., 1998). Furthermore, evolutionary psychologists tend to argue that adaptations are best located at the level of the underlying neurocognitive mechanism, rather than behaviour (Al-Shawaf et al., 2020; Tooby & Cosmides, 2005). In addition, developmental context plays an important role in the emergence and activation of adaptations (Buss et al., 1998). For example, there is some evidence that experience of a committed sexual relationship activates sexual jealousy adaptations (Buss et al., 1992, 1998). Alternatively, the absence of a father in an individual’s early years may incline them toward a short-term rather than long-term mating strategy (Buss et al., 1998). This consideration is

closely linked to the concept of *facultative* adaptations, which are those designed to be sensitive to specific social and ecological contexts and therefore may not manifest in all individuals (Schmitt, 2015).

By-Product

By-products have *not* been selected for, however they are related or linked to characteristics that have been. By-products neither solves adaptive problems nor have functional design, however they are coupled with relevant adaptations. A common example is the whiteness of bones, which is considered an incidental by-product of the large amounts of calcium in bones which were presumably selected for based on their strength rather than their whiteness (Buss et al., 1998). In the context of family violence, Wilson and Daly (1998) conceptualise intimate partner homicide as not adaptive or specifically selected for but as a by-product of relevant and adaptive techniques of coercive control such as male sexual proprietariness, mate-guarding, and jealousy.

Noise

Noise, or random effects, are non-adaptive features that are linked to random events. Noise is hypothesised to be “produced by mutations that neither contribute to nor detract from the functional design of the organism” (Buss et al., 1998, p.537). Al-Shawaf and colleagues (2020) suggest that noise should be considered the null hypothesis for researchers testing hypotheses about adaptations with evident signs of special design required before they can consider the identification of an adaptation.

Pathology

Pathology refers to the pathological malfunctioning of (one or more) adaptations, indicating an adaptation is not operating as it has been designed to (Durrant & Ward, 2015). This can lead to harmful by-products such as violent or abusive behaviour. Brain injury or

mental disorders are examples of psychopathology that may disrupt the functioning of adaptations.

A second key element to evolutionary psychology is the assumption that there are a large number of functionally specialised psychological adaptations (Confer et al., 2010). This is also known as the “massive modularity hypothesis”, which suggests there are a wide variety of domain-specific psychological adaptations that evolved as solutions to numerous and qualitatively distinct adaptive problems (Alcock, 2005; Confer et al., 2010; Durrant & Ward, 2015). The main reasoning behind this hypothesis is the simple idea that different adaptive problems are best solved by specialised adaptive solutions. It is unlikely the solution to one problem such as ‘food selection’ could also be successfully used for a different adaptive problem such as ‘mate selection’ (Confer et al., 2010). It is therefore logical to infer the brain has numerous specialised psychological adaptations in place that work most effectively in separation but toward the functioning of the whole system.

A final important element of evolutionary psychology is the idea that biological adaptations reflect past selective pressures (Buss, 2015). Evolutionary psychologists suggest that evolution is a relatively slow and gradual process, and the functional properties of the mind should therefore be considered as to how they solved adaptive problems in ancestral rather than modern environments (Durrant & Ward, 2015). The *environment of evolutionary adaptedness* (EEA) is a term used to describe the context in which hunter-gatherer populations would have faced various adaptive problems and the conditions under which they solved them (Buss, 2015). Given the stark differences observed between modern and ancestral environments, a number of contextual mismatches has likely negated the adaptive utility of various evolved psychological mechanisms (Confer et al., 2010; Li et al., 2018). For example, an evolved preference for foods high in fat and sugar was adaptive in the past, but in the modern world has led to high rates of obesity and Type 2 diabetes due to an

overabundance of unhealthy, processed food (Li et al., 2018). Similarly, aggression and physical violence may have been adaptive for resolving conflict in ancestral environments, however this behaviour is considered antisocial in the modern world and in extreme cases is resolved through a socially constructed criminal justice system. A behaviour that was once adaptive in an ancestral environment may now be considered maladaptive in a modern context. As Cosmides and Tooby (1997) put it, “Our modern skulls house a Stone Age mind” (p.10), which is an important consideration within evolutionary psychology.

Alternative Explanations to Evolutionary Psychology

Although evolutionary psychology is a dominant subfield of the human evolutionary behavioral sciences, it is important to recognise various alternative approaches within the literature. These include human behavioural ecology and gene-culture co-evolution.

Human Behavioural Ecology

Human behavioural ecology was developed by anthropologists in the 1970s and is based on the key assumption that human behaviour is highly flexible and produces adaptive outcomes in response to specific environmental conditions (Brown et al., 2011). Similar to research by behavioural ecologists who study non-human animals, human behavioural ecologists use mathematical models from the fields of ecology and evolutionary biology to predict the behavioural patterns of individuals (Brown et al., 2011). There is a particular emphasis on the role of environment in eliciting optimal behaviour, with less attention paid to the influence of other factors such as genes or socially learned information (Brown et al., 2011). Human behavioral ecologists are doubtful of the evolutionary psychology perspective that humans possess numerous innate psychological mechanisms. Instead, they assume that humans possess flexible and diverse cognitive abilities (Ward & Durrant, 2011).

Gene-Culture Co-Evolutionary Theory

Gene-culture co-evolutionary theory assumes that genes and socially transmitted information are two important inheritance systems that transmit through generations and interact in a number of ways (Brown et al., 2011). Proponents of this theory suggest the human capacity for culture is a biological adaptation associated with increased reproductive success (Ward & Durrant, 2011). In addition, it is assumed that cultural learning enables the evolution of culture through its ability to transmit down through generations and be 'inherited', similarly to one's genetic inheritance. Finally, a process of 'co-evolution' occurs in which an individual's genotype affects how and what they learn and which cultural traits they adopt, while the transmission of social information feeds back to modify the selection acting on the population (Brown et al., 2011). A well-known example of gene-culture coevolution is the development of lactose-tolerance (beyond childhood) as a hypothesised genetic response to the cultural evolution of dairy farming (Henrich & McElreath, 2007; Ward & Durrant, 2011). It is therefore important to acknowledge that cultural practices can interact and influence genetic evolution in certain environments.

Despite the differences of opinions on certain issues held by various proponents in the field of human evolutionary behavioral sciences, it is important to note that they have a shared agreement on the general application of evolutionary theory to human behaviour.

Patterns of Crime Explained from an Evolutionary Psychology Perspective

There are a number of robust patterns repeatedly observed in the literature on criminal offending. Firstly, there is a clear gender gap within offending. Men perpetrate more criminal offences than women, and this is particularly the case for more serious offences (Durrant, 2019). A second observation is crime is strongly patterned by age, with adolescents and young adults making up a large proportion of the offending population. A final pattern in the literature is that social disadvantage is strongly associated with criminal offending (Durrant, 2018). Researchers in the field of evolutionary psychology have developed a variety of

‘middle-level’ theories that aim to explain these recurrent patterns. These will be explored below.

Male Overrepresentation in Crime

It is hypothesised by evolutionary scholars that certain evolved differences between males and females are likely to have contributed to the gender gap in offending (Boutwell et al., 2015). Men and women have encountered different selective pressures over the course of human history, and these have influenced the differences observed in criminal/antisocial behavior (Boutwell et al., 2015). Parental investment theory is an evolutionary theory proposed by Trivers (1972) that has been applied to the gender gap in offending. This theory is based on the observation that among humans there is a large difference between the sexes in the minimum obligatory investment provided to offspring (Shackelford & Liddle, 2014). While women must provide internal fertilisation, a 9-month gestation period, and nursing for their offspring’s ensured survival, men’s minimum obligatory investment is the contribution of sperm (Shackelford & Liddle, 2014). Trivers (1972) hypothesised that the sex that invests relatively more in offspring becomes a limited resource for the less investing sex due to their preoccupation with parenting, leading to greater intrasexual competition for access to the more investing sex (Durrant, 2018). This implies men face greater competition for access to women. In addition, the ‘staying alive’ hypothesis proposed by Campbell (1999) hypothesises that given infant survival depends more upon maternal than on paternal care and defence, women are less likely to engage in aggression and other forms of risk taking as the costs of such behaviour are more reproductively costly for themselves than for men. Finally, the theory of sexual selection comes into play, as greater rates of same-sex competition observed among men indicate certain traits would be selected for in the male population (Figueredo et al., 2012b). These include being physically dominant, aggressive toward each other, and willing to take risks to attain status and hence promote mating success (Puts et al.,

2015). Furthermore, the human mating system is often characterised by extra-pair mating and polygynous socio-sexual units involving one male and multiple females, which has led to greater variance in reproductive success among males compared to females (Chapais, 2013; Fletcher et al., 2015). This has subsequently generated more intense sexual selection on males than females (Durrant, 2019). Both parental investment theory and sexual selection theory suggest limited access to women over human evolutionary history has resulted in men developing characteristics associated with criminal offending in the modern world such as aggressive tendencies and risk-taking behaviour.

Age-Graded Pattern of Offending

The age-graded pattern of offending is a very familiar concept to researchers of antisocial behaviour (Boutwell et al., 2015; Ellis et al., 2012). On average, antisocial behavior begins around the onset of puberty, peaks in late adolescence/early adulthood, and declines steadily thereafter (Piquero et al., 2003). This pattern of delinquent behaviour in late adolescence/early adulthood is so common within a general population (especially in males) it is considered typical developmental behaviour and is referred to as adolescent limited (AL) behaviour (Ellis et al., 2012; Moffitt, 1993). Evolutionary scholars argue this robust pattern is the result of increased competition over mating access at a time in which males and females are at their peak fertility (Boutwell et al., 2015). Although men can reproduce successfully across their life-course, women have a shorter fertility window ranging from adolescence to early adulthood and declining strongly with age until menopause. Heightened competition for mating access is therefore most adaptive if it occurs during both sexes combined peak fertility (Boutwell et al., 2015). In addition, there is a pressure on men during times of heightened competition to obtain status and maintain a good reputation (Wilson & Daly, 1985). These factors are directly correlated with male reproductive success due to female preferences for such characteristics (Kanazawa & Still, 2000).

In contrast to AL offenders, researchers have identified a small percentage of the population (5-10%) who commit a large proportion of all crime over their entire life-course (Moffitt, 1993). These individuals have been referred as life course persistent (LCP) offenders (Moffitt, 1993). One evolutionary-based explanation for this universal pattern is life history theory (Boutwell et al., 2015). Life history theory describes the “trade-offs” that individuals face regarding their choice to pursue parental investment or mating investment (Boutwell et al., 2015). Accelerated development is associated with increased mating effort, while species that mature more slowly invest more heavily in the care of their (relatively fewer) offspring (Rushton, 1985). The life strategies of different species fall on a continuum ranging from r (rapid maturation and low parental investment) to K (slow maturation and greater parental investment; Boutwell et al., 2015; Rushton, 1985). It is also hypothesised that there are important *within* species variation in life history strategy. LCP offenders tend to grow up in harsh, unpredictable environments associated with heightened stress and increased perceived risk of early mortality (Durrant & Ward, 2015). From an evolutionary perspective, it is hypothesised that these individuals gradually shift to fast life history strategies that involves risk-taking behaviour and greater focus on mating effort rather than parental effort (Durrant & Ward, 2015). This idea draws from the Adaptive Calibration Model (ACM), which is an evolutionary-developmental theory of individual differences in the functioning of the stress response system. ACM predicts that individuals exposed to stressful environments will adaptively calibrate toward a fast life history strategy based on environmental cues of unpredictability and early mortality (Del Giudice et al., 2011). This theory could provide, in part, an appropriate explanation for LCP offending.

Social Disadvantage and Criminal Offending

Social disadvantage is strongly associated with criminal offending world-wide (Farrington & Welsh, 2008). Evolutionary scholars suggest life history theory can shed light

on this phenomenon. Factors associated with social disadvantage include delinquent peers, deprived neighbourhoods, environmental unpredictability (changes in residence, family structure, resource availability), and increased salience of morbidity and mortality (higher levels of violence, disability, and death; Durrant & Ward, 2015). As predicted by the ACM, individuals exposed to such conditions are more likely to adopt a fast (rather than slow) life history strategy as an adaptive response to their unpredictable environment (Del Giudice et al., 2011). In addition to LHT, social learning theory may also play an important role in the association between social disadvantage and crime (Akers & Jensen, 2010). Delinquent peers, antisocial parents and deprived neighbourhoods are likely to have a criminogenic influence on the attitudes, beliefs and behaviour that an individual inherits (Akers & Jensen, 2010; Durrant & Ward, 2015).

Key Concepts and Theories Relevant for Understanding Family Violence

As described in the previous chapter, family violence is a highly prevalent health and social problem worldwide (Hillis et al., 2016). The importance of understanding its aetiological foundation and subsequently improving rehabilitation methods for individuals who have committed such offences is profound. Evolutionary psychology has the potential to provide distal explanations of family violence that could be of some utility to theoretical researchers and psychological practitioners. Various concepts and theories relevant to understanding family violence from an evolutionary-based perspective are examined below.

Family Relatedness

The degree of family relatedness is an important concept when understanding family violence. In general, kin are more likely than unrelated individuals to cooperate and display altruistic behaviour toward each other as a means of perpetuating shared genes (Archer, 2012). This phenomenon was coined by Hamilton (1964) as *inclusive fitness theory*, which refers to an individual's fitness that includes contributions from interactions with people who

share the same genes (Archer, 2012). Hamilton (1964) hypothesised that the proportion of relatedness (r , calculated as a relatedness coefficient ranging from 0-1 based on the probability of two individuals sharing the same allele) would be associated with the degree of altruistic behaviour (Archer, 2012). Therefore, an individual would demonstrate greater altruism toward a full sibling ($r = .5$) than toward a cousin ($r = .125$). The evolution of altruistic behavior is dependent on an evolutionary cost-benefit analysis in which the benefits of helping a relative (B) multiplied by its coefficient of relatedness (r) exceed the cost of doing so ($rB > C$; Durrant & Ward, 2015). The predictions of altruistic behaviour among kin also apply to competitive and aggressive behaviour. Although relatedness is expected to deter aggression among kin, contexts of scarce resources may elicit aggressive behaviour among related individuals, as they pursue their own fitness goals first and foremost (Archer, 2012). Furthermore, *inclusive fitness theory* implies conflict is more prevalent among stepfamilies than genetic families as there are decreased rates of relatedness among stepfamilies.

Paternity Certainty

Due to internal fertilisation and gestation, ancestral men could not be certain as to whether the children they invested in were, in fact, genetically their own (Goetz & Romero, 2011). The unwitting investment of resources into genetically unrelated children is referred to by biologists as *cuckoldry* and is a costly occurrence (Goetz & Romero, 2011). These costs include a loss of time, effort, and resources, and it is therefore hypothesised that natural selection favoured male strategies that deterred cuckoldry. One proposed strategy is male sexual proprietariness (or male sexual jealousy; Goetz & Romero, 2011). Male sexual proprietariness refers to a variety of evolved motivational/emotional mechanisms that function to reduce female infidelity and desertion through coercive control, threats of violence, and violence (Wilson & Daly, 2009). Mate-guarding is another term used in the literature on male sexual proprietariness and includes behaviour such as vigilance of a

partner's whereabouts and efforts to monopolise a partner's time (Goetz & Romero, 2011). Evolutionary scholars hypothesise that male-perpetrated Intimate Partner Violence (IPV) toward female partners is a tactic used to restrict their sexual behaviour outside of the intimate relationship as a solution to the adaptive problem of paternity uncertainty (Daly et al., 1982). Given IPV is a highly prevalent form of family violence, it is important to consider various theories such as paternity certainty as potential explanations of such phenomena. However, it must be noted that paternity certainty is unable to explain female-perpetrated partner violence.

Reproductive Value

Reproductive value (RV) refers to an individual's contribution to their kin's fitness at different ages (Archer, 2012). In most societies RV is low at the beginning of life due to infant and child mortality. It then peaks during an individual's reproductive years and declines steadily thereafter. This decline is steeper for women than it is for men as their ability to reproduce is limited to young adulthood (Archer, 2012). From an evolutionary perspective, it is expected that individuals would value a relative more who has a high rather than low reproductive value. As offspring become older, they will be valued more by parents, while parents will lose value as their RV declines (Archer, 2012). Patterns of family violence are consistent with this reasoning. For example, children are at greatest risk of abuse or homicide during infancy or early childhood (Brookman & Nolan, 2006; Malkin & Lamb, 1994). This risk is heightened when there is a shortage of resources during infancy or the physical prospects for the child are considered poor (Archer, 2012). Relevant literature also suggests parents experience higher rates of abuse from their children as they get older (Nock & Kazdin, 2002; Pagani et al., 2009). Finally, younger women are at greater risk of IPV than older women, which correlates with their higher RV (Archer, 2012). Overall, RV may provide some useful distal explanations to patterns of family violence.

Resource Holding Power

Understanding why violence occurs in some contexts and not others is an important consideration that Resource Holding Power (RHP) seeks to explain (Archer, 2012). RHP is the idea that individuals either escalate or withdraw from conflict based on cues of their opponent's fighting ability such as their size, strength, weaponry, and experience (Parker, 1974). The ability to assess an opponent's RHP and act accordingly is considered an evolutionarily stable strategy (ESS) as it is continuously observed over human history (Archer, 2012; Smith, 1982). RHP has a number of implications for the study of family violence. Firstly, although parents have greater RHP over their offspring, there comes a time in a child's life where this is reversed. This reversal is predicted to be associated with changes in patterns of parent-to-child and child-to-parent abuse (Archer, 2012). In addition, sibling and partner violence may also be reflective of unequal RHP within a close relationship.

Parent-Offspring Conflict Theory

Parent-offspring conflict theory (POCT) is based on the simple idea that within-family tension is inevitable due to conflict of interest between family members (Trivers, 1974). POCT is best understood in relation to kin selection theory (Hamilton, 1964; Schlomer et al., 2011). Hamilton (1964) hypothesised altruistic behaviour only evolves if the net gain to the recipient (B), multiplied by the genetic coefficient to the related donor (r), exceeds the costs experienced by the donor ($rB > C$) (Durrant & Ward, 2015). The higher the relatedness coefficient r between two individuals, the greater likelihood they would behave altruistically toward one another (Schlomer et al., 2011). Cooperation in families is therefore predicted as parents and offspring share on average 50% of their genes, as is the case for full siblings (Durrant & Ward, 2015). However, any individual shares 100% of their genes with themselves, suggesting a child is selected to demand a greater (disproportionate) share of

parental investment for themselves, relative to their siblings and to what their parents have been selected to give (Schlomer et al., 2011).

In addition, POCT suggests parents provide resources to offspring based on their *fitness* and *need*. Fitness refers to an individual's reproductive value, signalled by characteristics such as age, size, and health (Schlomer et al., 2011). Need refers to increasing an offspring's fitness through a unit of parental investment (Royle et al., 2004). Individuals with high fitness are expected to have less need for parental investment than their younger, weaker, or less healthy siblings (Schlomer et al., 2011). However, parents are expected to cease investment in offspring if their child is unlikely to survive due to poor health or a lack of environmental resources. These poor conditions have been found in the literature to correlate highly with child abuse/neglect and parental-inflicted infanticide (Daly & Wilson, 1988; Scheper-Hughes, 1992).

Sexual Conflict Theory

Sexual conflict theory stems from the fact that the reproductive interests of men and women often diverge (Buss, 2017). Given women have a longer obligatory parental investment period than men, the costs of making poor sexual decisions are higher for women. This creates a difference between males and females in their perceived 'optimum' for time elapsed before initiating sexual intercourse (Buss, 2017). Women prefer to wait a longer time than men before initiating sex to give themselves time to assess a potential mate's intentions, social status, resources, and other components of mate value (Buss et al., 2017). Men on the other hand are more driven to pursue short-term mating strategies. A co-evolutionary process occurs in which members of one sex possess adaptations to shift the opposite sex towards their own optima, while members of the opposite sex develop counteradaptation defences to combat this influence (Buss, 2017). One example is sexual deception, in which men feign long-term love in order to achieve short-term sexual opportunities. Anti-deception defences

observed in women include the *commitment scepticism bias* (Cyrus et al., 2011). Conflict is not only observed in the courting phase of a relationship, it is also present during a relationship and in the aftermath of a breakup. For example, infidelity and jealousy frequently occur within relationships, and behaviour such as stalking can occur post-breakup (Buss, 2017). Sexual conflict theory may provide useful insight into partner conflict.

Summary

Evolutionary psychology provides a variety of distal explanations for universal human behaviour. Patterns in general offending such as the overrepresentation of male perpetrators, heightened risk of offending in youth/young adults, and the link between social disadvantage and crime may appear inexplicable when considered only in terms of proximate explanations. There is therefore an apparent need to consider how an individual's behaviour is influenced by both *proximate* and *distal* factors. The ways in which family violence has been conceptualised from an evolutionary perspective and any insight this approach brings to understanding this heterogeneous and highly prevalent form of offending is the focus of the remainder of the current thesis.

Chapter Four: Methodology

Background

The systematic review process contained a number of methodological challenges. The literature of interest (evolutionary-based conceptualisations of family violence) was large, diverse, and conceptually messy. Relevant research ranged from original theoretical pieces, reviews of pre-existing theory, quantitative methods, archival reviews and editorial commentaries. The conventional systematic review methodology was thus deemed partially ill-suited for the literature at hand. Therefore, a framework known as ‘Critical Interpretative Synthesis’ (CIS) developed by Dixon-Woods et al. (2006) was used to complement traditional methods such as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Liberati et al., 2009; Moher et al., 2009) to guide the review process in a dual fashion.

Aggregative and Interpretative Reviews

The primary issue with applying a solely conventional systematic review methodology to the current review is grounded in the different aims of each process. Conventional reviews are best suited for *aggregative* syntheses, in which the main concern is to assemble and pool data with the intention of aggregating and summarising such data into neatly defined, stable and well specified concepts (or variables; Dixon-Woods et al., 2006). Aggregative syntheses work well for purely quantitative research, in which the concepts can be developed early in the review process and work as categories for the data to be summarised into (Dixon-Woods et al., 2006).

By contrast, interpretive reviews require both induction and interpretation in the synthesis process (Dixon-Woods et al., 2006). A more exploratory approach is required, in which concepts are not defined prior to analysis but rather drawn from the literature based on a critical, reflective examination that leads to the subsequent development of concepts and

theories (Dixon-Woods et al., 2006). The current review is more consistent with an interpretive approach as it is based on mixed-methodological research that is exploratory by nature and has the potential for novel theoretical development post-review.

Review Question

The current review question or goal was to examine and describe the different evolutionary-based conceptualisations of family violence developed over the last four decades. In contrast to conventional systematic reviews, the current question is broad and tentative, which reflects the exploratory, inclusive nature of the review. The review question was highly iterative, with modifications made in response to search results and findings from initial searches (Dixon-Woods et al., 2006). For example, the initial intention was to review all crime-related phenomena in the literature, however the scope was narrowed down to analysis of family violence literature only, due to time restraints.

Info Sources and Search

The following electronic databases were searched until October 20th, 2020: PsycINFO, PsycArticles, ProQuest Central, and Web of Science (all science citation indices included). Document restrictions included work in English only, no dissertations or theses, and a time frame of 1/1/1980 to 31/12/2019. A further restriction was applied to ProQuest Central to include only scholarly journals, books, reports, and working papers. This was due to the database providing irrelevant sources such as blogs and magazines. Additional details on the search strategy/syntax, including search terms for each database, are reported in Table 2. References of included literature were hand-searched (the ‘snowballing’ method) to find additional important papers not detected within the electronic search. Publications from a Google Scholar search were also obtained.

Eligibility Criteria

Inclusion Criteria

As previously noted, the initial intention of the systematic review was to examine all evolutionary-based conceptualisations of crime-related phenomena. The inclusion criteria reflects this broader goal with the initial search strategy aimed at identifying all theoretically distinct evolutionary-based conceptualisations of *crime*. This included conceptualisations of specific types of offending (e.g., homicide, filicide) and some specific phenomena that are closely linked with offending such as life history strategy. Upon identifying 269 publications that included both evolutionary theory *and* crime (inferred from their titles and abstracts), the reviewers recognised it would be difficult to review the full texts of all 269 publications within the time restraints of a 12-month master's thesis. This led to the decision to narrow the scope down to *family violence* literature in order to ensure a more specific, manageable, and thorough analysis was conducted. The rationale for focusing on family violence was that it included a variety of explanatory targets (such as child abuse and partner violence) and was broad enough that there was a substantial body of evolutionary literature on the topic, while being specific enough to ensure the number of publications reviewed remained manageable.

A phase two inclusion criteria was subsequently established in which the titles and abstracts of the 269 identified publications were reviewed with regards to their relevance to evolutionary conceptualisations of *family violence*. This step was undertaken before a full-text analysis was conducted. This process is demonstrated in Figure 1.

Finally, all publications were limited to those written in English between 01/01/1980 and 31/12/2019. The rationale for this time period was to ensure the number of sources remained manageable whilst still capturing the majority of important theoretical work that has been produced in the last forty years.

Exclusion Criteria

(a) unpublished theories presented in dissertations and doctoral theses, (b) theories about (non-human) animal behaviour, and (c) theories exclusively based on research with (non-human) animals.

Study Selection

References identified from the search strategy across all four databases were screened by the author based on the title and abstract of each publication. Given the search strategy/syntax (observed in Table 2) reflects the initial goal of examining all crime-related phenomena, the study selection process began broad with an identification of publications related to evolutionary-based conceptualisations of *crime*. However, these were subsequently narrowed down to publications specifically pertaining to family violence (such as partner violence, child abuse or filicide, sibling violence or siblicide and familicide or domestic homicide-suicide). Relevant guiding definitions that were used for the purpose of identifying which publications to keep for full-text analysis are as follows:

Evolutionary Psychology

The purpose of evolutionary psychology is to identify specific psychological adaptations which have evolved to solve problems related to survival and reproduction (Confer et al., 2010). Literature applying evolutionary theory to family violence was included in the review.

Family Violence

Family violence encompasses any acts between family members or intimate partners that result in physical abuse, sexual abuse, emotional abuse, neglect, or other forms of maltreatment that are detrimental to an individual's healthy development (Levesque, 2001). Content falling within this definition was included in the review.

Full-text screening was only conducted for publications that demonstrated a clear focus on family violence from an evolutionary perspective. Consultation with a secondary

coder occurred regarding the inclusion of any ambiguous material. A PRISMA flow-diagram that provides details regarding the process of narrowing down publications for the review is observed in Figure 1. This flow-diagram is based on a template provided by Moher et al. (2009). The inclusion of 17 articles from other sources such as a Google Scholar search and a hand-search (or ‘snowballing’) of the reference sections of included publications were additional ways of ensuring as much relevant family violence literature was captured as possible.

Determination of Quality

A number of challenges were faced in determining the quality of the literature. The complex array of methodological approaches indicated a conventional quality assessment method could not be conducted such as hierarchically ordering empirical studies based on their study design (Dixon-Woods et al., 2006). The aim of the review therefore was to prioritise papers that appeared most relevant, rather than focusing on specific papers or study types that meet set methodological standards (Dixon-Woods et al., 2006). Upon reading all full-text papers, no publications were excluded based on their irrelevance to the review. This likely reflects the exploratory nature of the review. Certain publications that may have seemed less informative remained in the analysis with the idea that they could provide some useful insight toward to the overall picture in the synthesis process.

Data Extraction

Data extraction was performed by the author, with a sample of papers coded by a second expert coder to generate inter-coder reliability (Cantor, 1996). It must be noted that the nature of the coding process did not lend itself to a quantitative assessment of reliability as most of the codes were transparent (e.g., document type, publication details). Where the codes were less obvious (e.g., evolutionary conceptualisation) publications often contained multiple statements regarding different phenomena. Therefore, rather than computing

reliability statistics, a second coder reviewed a sample of publications ($n = 10$) and any differences in interpretation were discussed and resolved through reviewing the article content and any relevant wider evolutionary psychological literature.

Data extracted from each publication included: (1) document type (theory, empirical (experimental, archival, or correlational), commentary); (2) publication details (authors, date of publication); (3) explanatory target (specific criminal offence in question, e.g., female perpetrated intimate partner violence, child abuse, filicide, etc); (4) evolutionary conceptualisation (whether the explanatory target was considered an adaptation, by-product, or pathological). This was determined based on an interpretation of the authors' argument. If the authors suggested the explanatory target under consideration was selectively advantageous (i.e., likely to have advanced reproductive success in ancestral conditions) then it was classified as an 'adaptation'. This was the case even if the proposed psychological mechanism was likely responsible for numerous (adaptive) outcomes under varying contexts. For example, claims that IPV would have helped to reduce paternity uncertainty was coded as an 'adaptation', even if the underlying mechanism (e.g., male sexual jealousy) is related to a variety of both violent and non-violent outcomes. In cases where the authors argued that the explanatory target was selectively advantageous for a sub-set of individuals under specific circumstances the reviewers still coded this as an adaptation, however in the description it was noted as a 'facultative' adaptation. The code of 'by-product' was used if the explanatory target was deemed not selectively advantageous in ancestral environments, even if it was closely related to behaviours (and underlying mechanisms) that would have been. For example, it might be argued that intimate partner homicide does not increase reproductive success and thus is a by-product of male intimate partner violence/sexual jealousy. 'Pathology' was used when the explanatory target was suggested to arise due to a dysfunction in underlying processes. In other words, the explanatory target was not selectively

advantageous and mechanisms underlying the behaviour reflect a malfunction in normal processes (e.g., child sexual abuse arising from sexual preferences for pre-pubescent children); (5) a brief description of the author's research, and (6) the proposed psychological mechanism (if any) behind the discussed phenomena. The psychological mechanism refers to the proximal way the adaptive function is realised. For example, male sexual jealousy is argued to reflect an underlying psychological mechanism that is the proximate trigger for subsequent partner violence. A unique ID column was also created to code for the author's specific theoretical perspective. Subsequent publications that proposed the same theory were assigned the same ID, whilst new theories were given separate unique ID codes. All coding was put in an Excel table that was reviewed by both coders.

Data Synthesis

The CIS synthesis process has a basis in Noblit and Hare's (1988) meta-ethnography approach to analysis, which has typically been used for qualitative research. There are three main components to meta-ethnography: reciprocal translation analysis, refutational synthesis, and line of argument synthesis. A modified version of this approach that accounts for more varied methodologies and a greater quantity of papers was developed by Dixon-Woods and colleagues (2006).

Reciprocal Translation Analysis

Reciprocal Translation Analysis (RTA) involves identifying key metaphors, themes, or concepts in each study and recognising how they translate into all other studies included in the review. Thus, recognising important and recurring similarities or themes across all studies. Dixon-Woods et al. (2006) identified that the task of cross-comparing all studies individually is difficult when attempting to review a large set of papers, and suggest RTA is best suited for a relatively small (less than 50) set of papers. The current study had a sample of 54 papers and faced similar methodological issues with RTA, thus opting for a more

general identification of similar metaphors and themes across all studies. This was not a traditional RTA, as each study was not compared separately with all other studies individually.

Refutational Synthesis

Refutational synthesis involves identifying aspects of the literature that aim to refute other authors' perspectives or demonstrate divergent ideologies (Noblit & Hare, 1988). Dixon-Woods and colleagues (2006) view this process as an ongoing reflexive and critical approach to reviewing the literature. The current reviewers made sure to identify contrasting perspectives in the literature during the synthesis process and think critically as to whether the research demonstrated any contradictions and/or flaws in theory and evidence.

Line of Argument Synthesis

Line of Argument Synthesis (LOA) is a process of building a general interpretation of the research, grounded in findings across all studies (Dixon-Woods et al., 2006). This is referred to as a synthesising argument, in which synthetic constructs are developed to help build a coherent theoretical framework across all studies (Dixon-Woods et al., 2006). The present study worked to identify a variety of synthetic constructs that helped bring meaning to the complex array of literature.

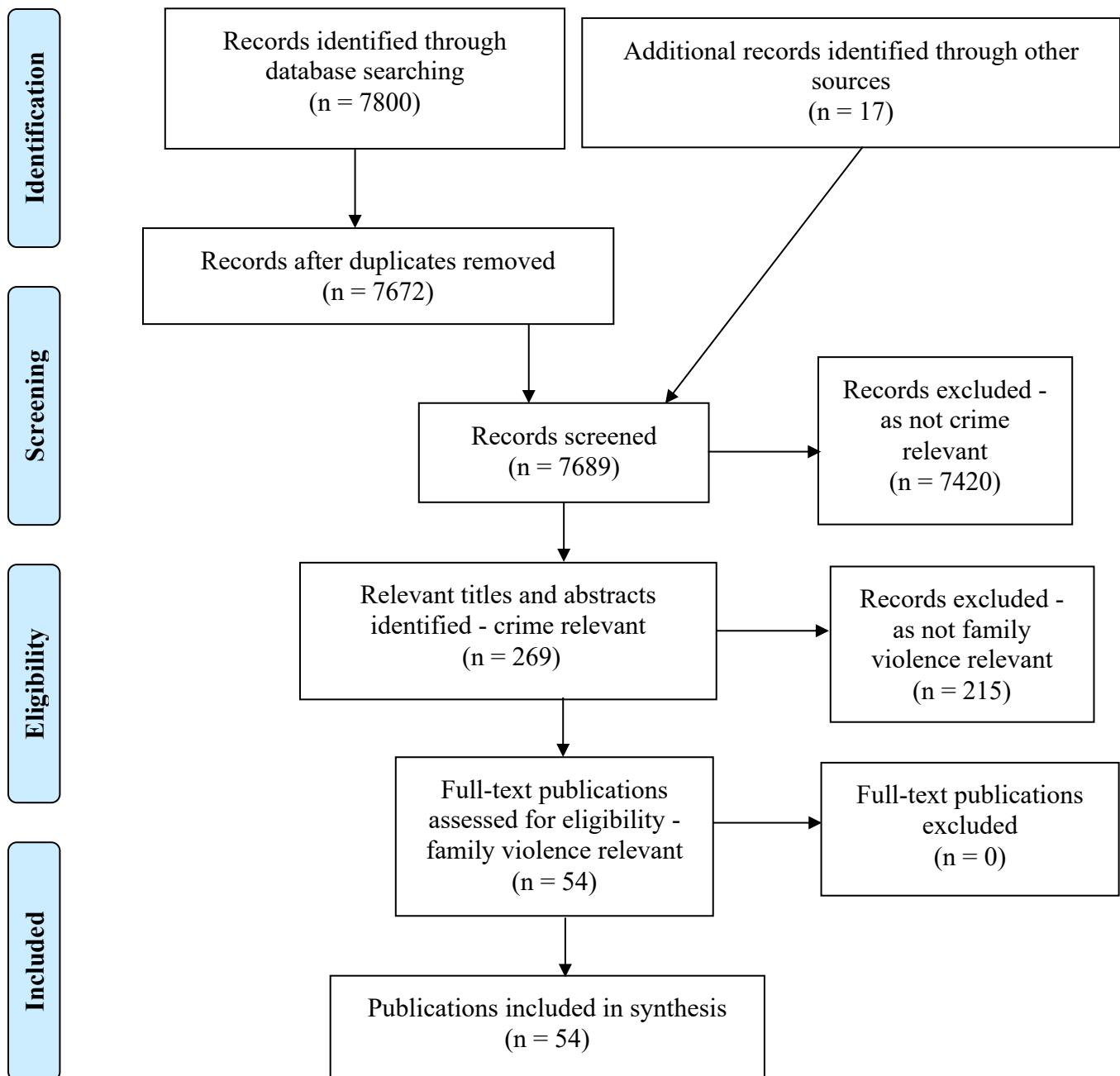
Table 2*Search Strategy and Results from each Database Search (Last Search October 20th, 2020)*

PsycINFO	
Search terms:	("evolutionary psychology" OR sociobiology) AND (Crime OR criminal OR violence OR homicide OR rape OR “sexual coercion” OR “sexual abuse” OR theft OR psychopathy OR sociopathy)
Limits:	English; no dissertations or theses; time period: 1/1/1980-31/12/2019
Results:	696 publications
PsycArticles	
Search terms:	("evolutionary psychology" OR sociobiology) AND (Crime OR criminal OR violence OR homicide OR rape OR “sexual coercion” OR “sexual abuse” OR theft OR psychopathy OR sociopathy)
Limits:	English; no dissertations or theses; time period: 1/1/1980-31/12/2019
Results:	998 publications
Web of Science Core Collection (all citation indices)	
Search terms:	("evolutionary psychology" OR sociobiology) AND (Crime OR criminal OR violence OR homicide OR rape OR “sexual coercion” OR “sexual abuse” OR theft OR psychopathy OR sociopathy)
Limits:	English; no dissertations or theses; time period: 1/1/1980-31/12/2019
Results:	255 publications
ProQuest Central	
Search terms:	("evolutionary psychology" OR sociobiology) AND (Crime OR criminal OR violence OR homicide OR rape OR “sexual coercion” OR “sexual abuse” OR theft OR psychopathy OR sociopathy)

Limits: English; only scholarly journals, books, reports, working papers; time period: 1/1/1980-31/12/2019

Results: 5851 publications

After merging and removing duplicates: 7672 potential references to screen the title and abstracts of.

Figure 1*PRISMA Flow Diagram*

From: Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group (2009).

Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA

Statement. *PLoS Med* 6(7), e1000097. doi:10.1371/journal.pmed1000097

Chapter Five: Results

The current chapter begins with an overview of some of the general characteristics of the publications included in the systematic review. In addition, a description of the themes developed are detailed.

Study Design

Of the 54 publications included in the review, 27 were theoretical, comprised of either original theoretical hypotheses or reviews of pre-existing theories. These were made up of 15 journal articles, 11 book chapters, and one book. In addition, there were 24 empirical studies, comprised of 15 experimental, eight archival, and one correlation study. Finally, there were three commentaries included in the review.

Explanatory Targets

The explanatory targets identified in the review included partner directed violence and/or sexual coercion and/or homicide (32 publications), child abuse and/or filicide (12 publications), sibling violence and/or siblicide (2 publications), familicide/domestic homicide-suicide (2 publications), and family violence in general (6 publications). This distribution demonstrates a heavy focus in the literature on partner violence. In addition, there is a paucity of research in the area of sibling violence and child-to-parent violence.

Patterns of Research over Time

An interesting aspect of the review was the distribution of research over the four decades included in the analysis (1980-2019). The number of included publications published each decade is observed below:

- 1980s = three publications
- 1990s = nine publications
- 2000s = 17 publications
- 2010s = 25 publications

As identified, almost half of all publications were published in the last 10 years. This pattern could reflect numerous societal shifts, such as an increased normalisation and prioritisation of evolutionary-based research, or greater public health attempts to mitigate family violence in the general population (Webster, 2007).

Another interesting pattern was the inclusion of female-perpetrated partner violence within the last decade. Although only two publications specifically focused on this explanatory target (Cross & Campbell, 2011; Cross & Campbell, 2014), other studies also found the presence of sexual jealousy in both sexes (Buss, 2013), and violent or controlling behaviour at similar rates for both sexes (Graham-Kevan & Archer, 2009). This pattern could again reflect changes in societal perceptions that has led to the identification of nuanced types of partner violence such as controlling behaviour that was not previously identified in past research.

Synthesis

The next section of this chapter includes each individual publication summarised in table format. The summaries are grouped into three sections based on their research design - either theoretical, empirical, or commentary. This process of delineating the findings based on their methodological differences was a technique used to depict what the theory says, how it is observed empirically, and the relevance of any commentaries. These publications are each analysed separately, starting with all theoretical publications (Table 3). Upon reading each article across all methodologies separately, six synthetic constructs (or themes) were developed to make sense of the literature as a whole. These constructs include reproductive value, males sexual and familial proprietariness, fast life history strategy, relatedness as a protective factor, lack of resources, and lethal violence as pathology. A synthesis was subsequently conducted at the end of each methodological table (theory, empirical or

commentary) to identify how (and if) they fit into the six overarching synthetic constructs.

The following fields are presented in each table.

- Document type: theory, empirical (experimental, archival, correlational), commentary
- Author/year of publication
- Explanatory target: exact crime being discussed
- Evolutionary conceptualisation
- Unique ID: specific theoretical perspective
- Description: main findings
- Proposed psychological mechanism
- A = article, B = book, BC = book chapter

Table 3*Summarised Version of all Theoretical Publications*

Document type, author, year	Explanatory target	Evolutionary conceptualisation	Unique ID	Description	Proposed psychological mechanism
Theory - A Cross, C. & Campbell, A. (2011)	Female perpetrated Intimate Partner Violence (IPV)	By-product	Theory of reduced fear associated with female perpetrated IPV	Female perpetrated IPV is a by-product of reduced fear, which would usually serve as an adaptive mechanism to decrease exposure to physical violence. This reduced fear occurs within intimate relationships and is mediated by increased oxytocin released within the female body during a relationship. This hypothesis could explain current literature that suggests women's use of aggression is consistently lower than men's, except within intimate partnerships.	Failure of the female-specific violence-inhibiting fear mechanism
Theory - A Buss, D. M, & Duntley, J. (2011)	Male perpetrated Intimate Partner Violence (IPV)	Unclear, adaptation and by-product hypotheses are both considered	Co-evolutionary theory of IPV; Sexual conflict theory	Sexual conflict is caused by differences between men and women. This has led to a 'co-evolutionary arms race' in which humans have evolved a psychology of tactical deployment designed to influence a partner's behaviour to ensure it is more in line with their own optimum. These tactics are both benefit-bestowing and cost-inflicting. Male perpetrated IPV is conceptualised as an adaptation or by-product to solve adaptive problems ranging from sexual infidelity to relationship termination.	Sexual jealousy - sensitive to cues of infidelity such as mate value discrepancies and presence of viable mate poachers
Theory - A Schlomer, G. L., Del Guidice, M., & Ellis, B. J. (2011)	Conflict within families	Adaptation	Parent-offspring conflict theory (POCT)	Parent-offspring conflict theory (POCT) is a biological theory that brings insight to patterns observed in family conflict. POCT suggests that conflict is the expected outcome of different fitness interests of parents and offspring. Stepchild abuse, neglect, and homicide are adaptive responses to selectively prioritise one's own reproductive success, followed by kin, and lastly, unrelated individuals.	Discriminative parental solicitude

Theory - BC Belsky, J. (2016)	Male perpetrated Intimate Partner Violence (IPV)	Adaptation or by- product	Male sexual proprietaryness theory	This book chapter examines marital violence from an evolutionary perspective. The author hypothesised marriage has various biological costs. For women, they have a decreased opportunity to mate with a more genetically "fit" man, due to being with their pair-bonded mate. Men face the high cost of being unable to mate with numerous other women, which is a potential way of increasing their reproductive success. Men must therefore ensure the progeny they invest in are their own. This has led to jealousy, controlling behaviours, coercive tactics and subsequent violence being selected for among men to ensure their wife remains faithful and will not desert them.	Male sexual proprietaryness
Theory - A Friedman, S. H., Cavney, J., & Resnick, P. J. (2012)	Filicide by parents	Adaptation	Discriminative parental solicitude	An examination of contexts in which filicide by parents are considered adaptive from an evolutionary perspective. Filicide is facultatively adaptive when the child is young (thus has a low reproductive value), and the mother is young and lacks both financial and social support. The author suggest evolutionary psychology can help differentiate between evolutionarily normal rationales for filicide and mentally abnormal cases of filicide. This can subsequently inform clinical psychologists' case formulations and rehabilitation approaches.	Discriminative parental solicitude

<p>Theory - A</p> <p>Chester, D. S., & DeWall N. C. (2018)</p>	<p>Male perpetrated Intimate Partner Violence (IPV)</p>	<p>Not specified. Potential to be an adaptation, by-product, or pathology dependent on context</p>	<p>Self-defence theory of IPV, Male sexual proprietariness theory</p>	<p>A brief review of ultimate explanations for IPV. Possible suggestions include IPV having evolved because it facilitated survival goals (e.g., self-defence) and reproductive goals such as to help reacquire former mates. IPV could be a by-product of self-defence adaptations or an adaptive response to solve partner infidelity or desertion. By contrast, neurological and neuroendocrine findings suggest pathology may play a role as IPV perpetrator have higher rates of traumatic brain injury and testosterone levels than matched controls.</p>	<p>Self-defence mechanisms, proprietary jealousy, or failure in functioning of normal psychological mechanisms due to injury such as head trauma</p>
<p>Theory - A</p> <p>Buss, D. M, & Duntley, J. D. (2014)</p>	<p>Male perpetrated Intimate Partner Violence (IPV)</p>	<p>Unclear, adaptation and by-product hypotheses are both considered</p>	<p>Co-evolutionary theory of IPV; Sexual conflict theory</p>	<p>Reiteration of ideas by Buss and Duntley (2011). Adaptive problems toward which partner violence is directed included mate poachers, sexual infidelity, suspicions of genetic cuckoldry, resource infidelity, resource scarcity, mate value discrepancies, stepchildren, terminating the mateship, mate reacquisition, and preventing a former partner from remating. Mating violence stemming from adaptations for violence or as a nonadaptive by-product of other mechanisms are both considered by the authors.</p>	<p>Sexual jealousy - sensitive to cues of infidelity such as mate value discrepancies and presence of viable mate poachers</p>
<p>Theory - BC</p> <p>Daly, M. (1989)</p>	<p>Parent-offspring conflict; neonaticide/parent-offspring violence</p>	<p>Adaptation (expected outcome of different fitness interests of parents and offspring); Neonaticide (adaptation/by-product)</p>	<p>Parent-offspring conflict theory (POCT)</p>	<p>Parent-offspring conflict (and sibling conflict) occurs as an expected outcome of different fitness interests, as those of parents and offspring are not in perfect alignment. Individuals are most likely to invest resources in relatives who they are most genetically related to and they perceive as likely to survive and reproduce, as this altruistic behaviour has direct fitness benefits for themselves. Neonaticide is likely a facultative adaptation or by-product and often occurs due to factors such as paternity doubt, poor phenotypic quality of the</p>	<p>Discriminative parental solicitude</p>

				child, and circumstantial considerations such as poverty, famine, and lack of social support. Although neonaticide may have been historically 'adaptive', most are not in contemporary environments and are considered failures of mechanisms underlying parental solicitude.	
Theory - BC Cross, C. & Campbell, A. (2015)	Female perpetrated Intimate Partner Violence (IPV)	By-product	Theory of reduced fear associated with female perpetrated IPV, Gene- culture co- evolutionary theory	This article explores why patterns in women's aggressive and violent behavior differs cross-culturally and inconsistently with various evolutionary theories. Women are generally less aggressive than men, which is hypothesised to be a reproductively adaptive strategy and evidence suggests this is driven by the higher levels of fear they possess compared with men. It is paradoxical therefore that patterns of IPV in WEIRD (Western, Educated, Industrialised, Rich, and Democratic) societies demonstrate gender-symmetric rates of violence. The authors suggest this is the result of a 'Gene-Cultural Co-Evolution' in which women in WEIRD societies of high gender empowerment have weaker inhibition of their aggressive impulses as men are less likely to retaliate with aggression. Countries with lower gender empowerment/equality are associated with male-biased IPV perpetration rates, consistent with the idea that women in these nations maintain their fear to perpetrate such violence due to the realistic threat of retaliation by men. Female partner directed violence is therefore considered a by-product of a facultative fear adaptation among women, moderated by environmental cues.	Culturally variable cues leading to a failure of the female-specific violence-inhibiting fear mechanism within women from Western nations

Theory - BC Salmon, C. A. & Hehman J. A. (2014)	Sibling conflict and siblicide	Sibling aggression/violence selected for (adaptation) to obtain fair/greater share of parental resources; Siblicide (by-product) of selection for sibling conflict	Sibling Conflict Theory, Kin Selection Theory	Sibling conflict is a normal feature of sibling relationships and arises over parentally mediated resources. Various factors that increase the likelihood and intensity of sibling conflict include differential parental treatment, relatedness, gender (and gender of sibling), birth order and spacing. Siblicide is probably not specifically selected for (compared to other species) and typically occurs among older siblings reflecting 'rational' decision making over allocation of parental resources/status.	Unclear, but possible mediating mechanisms include sensitivity to amount of parental investment; ownership of resource; degree of relatedness; perceived needs of siblings (birth order/spacing)
Theory - BC Daly, M. (2016)	Interpersonal conflict and violence within families	Partner conflict/violence (adaptation); Partner homicide (by-product)	Male sexual proprietariness theory	Daly (2016) provides an overview of interpersonal violence and conflict from an evolutionary perspective. The author suggests kinship should mitigate lethal violence due to shared fitness interests. This hypothesis is based on Hamilton's (1964) inclusive fitness theory. In addition, Daly (2016) suggests high rates of family violence observed in the literature are conflated by intimate partner violence, which occurs between unrelated individuals, not genetic kin. The author hypothesises that the main cause of couple conflicts is male sexual jealousy (adaptation). Homicide is likely a by-product of male sexual jealousy.	Male sexual jealousy

Theory - A Archer, J. (2012)	Family Violence in general	No evolutionary conceptualisation was identified	Kin selection theory, reproductive value, resource holding power	The author evaluates the application of evolutionary principles to research on family violence. These principles include kin selection theory, reproductive value, and resource holding power. Evolutionary predictions derived from kin selection and reproductive value were consistent with a number of patterns observed in experimental studies that were reviewed. For example, there were higher rates of violence to stepchildren (vs. genetic children), a decline in violence as offspring got older, and an increase in violence toward parents with increased parental age. Male partner violence could not be explained through the main evolutionary explanation of mate guarding (as a result of paternity uncertainty) in Western studies, given there was no significant sex difference in control and violence.	Kin recognition mechanisms, gradual development of parent-to-offspring bond, gradual lessening to offspring-to-parent bond, offspring's perception of parental age
Theory - BC Daly, M. & Wilson, M. (1998)	Family Violence in general; filicide (biology or stepparent); male partner directed violence or homicide	Child abuse of genetic offspring adaptation in certain contexts; stepchild abuse as by-product; IPV as adaptation; familial homicide in any form as by-product	General family violence	Child abuse and filicide of genetic offspring are conceptualised as failures of the adaptation 'discriminative parental solicitude', which evolved to ensure the propagation of a parent's genes. This abuse may however be a facultative adaptation in contexts where a child is unlikely to reproduce due to having disadvantageous characteristics such as defects/disabilities. Child abuse or filicide of non-genetic offspring reflect a lack of parental solicitude and not possessing the protective adaptation 'child-specific parental love' due to their unrelatedness, violence being a by-product of this lack of love. The authors hypothesised the main motive of IPV and partner homicides is male sexual proprietariness. Men do not want to be cuckolded and thus resort to IPV and partner homicide as a response to suspected infidelity or as to coerce their partner into not leaving them. All homicides in the family context are conceptualised as dysfunctionally extreme by-products (or 'overreactive mistakes') of violent inclinations that are generally less severe and more effective in getting the desired behaviour from their victim.	Discriminative parental solicitude; male sexual proprietariness

<p>Theory - A</p> <p>Figuerdo, J. A., Gladden, P. R., & Beck, J. A. C. (2012a)</p>	<p>Male perpetrated Intimate Partner Violence (IPV)</p>	<p>Adaptation</p>	<p>Life History Theory</p>	<p>The authors claim Life History (LH) theory is the most comprehensive approach to explaining IPV perpetration. Put simply, LH theory is the idea that people with a 'fast' life history strategy put more investment in mating effort rather than parental investment (as compared with a 'slow' life history strategy) and adopt a lifestyle of risk-taking, impulsive behaviour, casual sex, and decreased law-abidingness. The authors suggest LH theory can explain patterns in the IPV literature. For example, the link between IPV and insecure attachment styles could be explained through the finding that a secure attachment style is an indicator of a slow LH strategy. IPV may reflect people operating from a fast LH strategy, while a slow LH strategy inhibits violence against sexual partners. IPV is thus considered a facultative adaptation of adopting a fast LH strategy based on factors such as genes or cues of unpredictability such as insecure attachment.</p>	<p>Facultative calibration of mate preference mechanisms (preference for mating effort over parental investment), impulsivity and antisocial behaviour all triggered by conditions of unpredictability/harshness</p>
<p>Theory - A</p> <p>Goetz T. A., Shackelford T. K., Romero G. A., Kaighobadi F., & Miner E. J. (2008a)</p>	<p>Male perpetrated intimate partner homicide and sexual coercion</p>	<p>Not specified for partner killing; forced in-pair copulation as adaptation</p>	<p>Male sexual proprietariness theory</p>	<p>Partner killing by men, by design or by accident, is conceptualised as the behavioural output of male sexual jealousy, driven by perceptions of paternity uncertainty. Forced in-pair copulation is selected for in response to perceived infidelity to reduce risk of cuckoldry.</p>	<p>Male sexual proprietariness, key role for jealousy.</p>

Theory - BC Goetz T. A., & Romero G. A. (2011)	Male perpetrated Intimate Partner Violence (IPV)	Not specified – Adaptation or by- product	Male sexual proprietaryness theory	Reiteration of ideas from Goetz et al. (2008a). Paternity uncertainty has led to evolved psychological mechanisms in men such as the emotion of sexual jealousy which is designed to decrease the occurrence of cuckoldry. Sexual jealousy can lead to mate guarding behaviour and occasionally IPV. Family contexts that exacerbate rates of violence include the presence of stepchildren and individuals cohabiting rather than being married.	Male sexual proprietaryness, key role for jealousy.
Theory - BC Levesque, R. J. R. (1997)	Family Violence	Adaptation	Life History Theory	Family violence in various manifestations is a facultative adaptation to ecological instability. This hypothesis is supported by research that demonstrates modern markers of ecological instability such as financial pressures, anxiety, underemployment, and alcohol abuse are common predictors of partner violence and child maltreatment. Implications for prevention and interventions are explored.	Key mechanisms include paternity uncertainty, male sexual jealousy
Theory - A Kaighobadi, F., Shackelford, T. K., & Goetz, A. T. (2009)	Male perpetrated Intimate Partner Violence (IPV); forced in-pair copulation	Unclear, partner violence and sexual coercion likely adaptations to solve paternity uncertainty	Male sexual proprietaryness theory, sperm competition and semen displacement hypotheses	The adaptive problem of paternity uncertainty is hypothesised to have selected for male sexual jealousy, which results in violent and non-violent reactions to perceptions of partner infidelity. Sexual coercion or rape of an intimate partner is also hypothesised to be an anti-cuckoldry tactic in which suspicion of a partner's infidelity leads to a man introducing their own sperm into their partner's reproductive tract and thereby decreasing the risk of cuckoldry.	Male sexual jealousy

Theory -A Starzomski, A. & Nussbaum, D. (2000)	Domestic Homicide- Suicide	Not clear, potentially a by- product of a male familial proprietariness adaptation. Alternatively, pathology, reflecting psychological disturbances	Domestic Homicide- Suicide	A review of Daly and Wilson's (1988) work that suggests men possess a strong proprietary attitude toward their wives and children which when threatened can lead to homicide-suicide (H-S) inclinations. Psychopathology is another perspective considered by the authors, as domestic H-S is often associated with depression, severe stress, schizophrenia, morbid jealousy, and various other psychological disturbances.	Male sexual and familial proprietariness, including a key role for jealousy; failure in brain functioning due to psychological disturbances
Theory - A Daly, M. & Wilson, M. (2000)	Family Violence in general; child abuse or filicide; male directed partner violence or homicide	Adaptation or by- product, dependent on context	General family violence	Reiterations of ideas by Daly and Wilson (1998). Family violence is reviewed from an evolutionary perspective, with each form of violence predicted to stem from qualitatively different adaptations. It is predicted parents modulate their solicitude toward offspring as an adaptive response based on their child's reproductive value. In addition, parents are more likely to cherish and make sacrifices for their offspring as they get older and are capable of reproducing. Finally, IPV is conceptualised as potentially an adaptation and the result of male sexual jealousy that functions to decrease paternity uncertainty. Partner homicide is described as a maladaptive by-product of coercive martial violence.	Child abuse or filicide - discriminative parental solicitude; IPV or homicide - male sexual proprietariness

Theory - BC Wilson, M. & Daly, M. (1998)	Non-lethal violence; lethal violence against wives/partners	Adaptation (male violence and control against wives); By-product (uxoricide)	Male sexual proprietariness theory	Violence and control of wives has been selected for to reduce paternity uncertainty/female infidelity/mate desertion. Killing of wives is a by-product (non-adaptive) of selection for control and aggression/violence.	Male sexual proprietariness, including key role for jealousy
Theory - A Buss, D. M. (2013)	Sexual jealousy	Not specified. Presumably Adaptation (male violence against partner); By-product (uxoricide)	Sex differentiated mate-retention	Sexual jealousy is conceptualised as a basic human emotion, with sex-differentiated design features based on the different adaptive problems faced by men as compared to women. One example is evidence suggesting men get more upset at women's sexual infidelity over emotional infidelity, while the reverse pattern is observed in women. Cues of sexual infidelity and defection are predicted to trigger sexual jealousy among men and in extreme cases lead to non-lethal and lethal partner violence.	Sex-differentiated jealousy
Theory - BC Wilson, M. (1989)	Male perpetrated Intimate Partner Violence (IPV) and homicide	Adaptation (male violence against partner); By-product (uxoricide)	Male sexual proprietariness theory, male familial proprietariness theory	Wife beating selected for to solve the adaptive problem of paternity uncertainty/female infidelity/mate desertion. Uxoricide presumably a by-product of these evolved functions. Familial-suicide (which is almost always perpetrated by men) is similarly conceptualised to reflect the proprietary mind-set that men have over their family.	Male sexual proprietariness, male familial proprietariness

Theory - BC Goetz T. A., Shackelford T. K., Starratt, V. G., & Mckibbin, W. F. (2008b)	Male perpetrated Intimate Partner Violence (IPV) and in- pair sexual coercion	Adaptation	Male sexual proprietaryness theory	Reiteration of ideas from Goetz et al. (2008a). Male sexual jealousy functions to negate paternity uncertainty. Sexual jealousy can develop into partner violence or forced in-pair copulation in contexts where a man is doubtful of his partner's fidelity or suspects she will desert him.	Male sexual proprietaryness, key role for jealousy
Theory - B Platek, S. M. & Shackelford, T. K. (Editors) (2006)	Male perpetrated Intimate Partner Violence (IPV), in-pair sexual coercion, child abuse	Adaptations	The three-stage theory of anti- cuckoldry tactics	Three main anti-cuckoldry strategies used by men include: mate-guarding strategies, intra-vaginal strategies, and post-partum strategies. Mate-guarding strategies are attempts by a man to limit his mate's opportunities for extra-pair copulations that could result in pregnancy. Intra-vaginal strategies include forced in-pair copulation, sperm competition, and semen displacement. Post-partum strategies are techniques of assessing paternity post-parturition. Men are sensitive to identifying the degree to which a child resembles them and respond favourably to facial resemblance in children. fMRI studies indicate males may have evolved specific neurocognitive mechanisms that influence their decisions to provision for children. Fathers who abuse their stepchildren or children with whom they share little physical resemblance reflect an evolved adaptation to invest solely in one's own genetic offspring. All strategies are conceptualised as adaptations to solve the adaptive problem of paternity certainty.	Male sexual proprietaryness; Kin recognition mechanisms; Discriminative parental solicitude
Theory - A Daly, M. & Wilson, M. (1996)	Step-child abuse	By-product	Discriminative parental solicitude	Higher rates of stepchild abuse and homicide among stepparents versus genetic parents are predicted to reflect the lack of parental solicitude and child-specific love and commitment adaptations that only genetic parents possess	Discriminative parental solicitude, lack of child- specific love and commitment

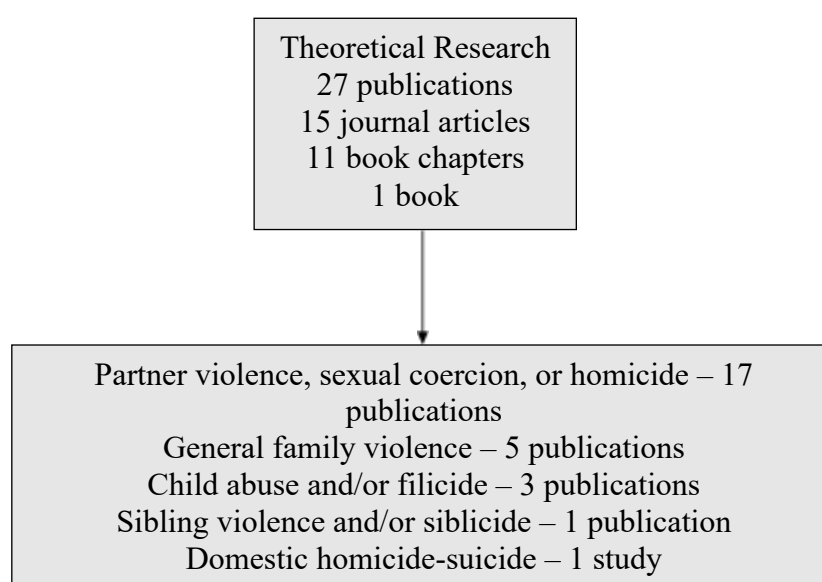
				toward their children. Stepchild abuse is thus the outcome (by-product) of less parental solicitude/love.	
Theory - A	Partner violence	Adaptation	Sexual selection theory	Sexual selection is conceptualised as a better explanation for sex differences in aggression than social role theory. Put simply, the more aggressive and competitive sex is often males (particularly in mammals) due to their lower parental investment. Direct aggression is considered a more costly reproductive action by women than men due to human offspring's higher reliance on their mother for their survival than their father. This is predicted to result in greater risk taking in men and/or more fear of physical danger by women. Male perpetrated partner violence is conceptualised as a facultative adaptation in contexts where men are physically more powerful, have greater control over resources, and their partner has a lack of support from natal kin, among numerous other factors.	No specific mechanisms specified; general mechanisms underlying aggression

Synthesised Findings of Theoretical Research

There were 27 theoretical research pieces included in this table, predominantly comprised of journal articles and book chapters, with the inclusion of one book. The explanatory targets included: partner violence and/or sexual coercion and/or homicide (17 publications), child abuse and/or filicide (3 publications), sibling violence and/or siblicide (1 publication), domestic homicide-suicide (1 publication), and general family violence (6 publications). How the publications fit into the six overarching themes will be explored below.

Figure 2

Proportion of Explanatory Targets within all Theoretical Publications



Lack of Resources

A lack of financial and social resources was a recurring theme associated with family violence. Levesque (2001) conceptualised family violence as a facultative adaptation to ecological instability, explaining the association between common predictors of partner violence and child maltreatment being modern markers of ecological instability such as underemployment, financial pressures and alcohol abuse. Friedman et al. (2012) similarly described neonaticide as a facultative adaptation when committed by young mothers who

lack both financial and social support. Adaptively ridding oneself of offspring unlikely to survive allows such mothers to focus on accruing resources to invest in future offspring (Friedman et al., 2012). Finally, Salmon and Hehman (2014) suggested sibling violence/aggression is selected for to obtain limited parental resources, while siblicide is a by-product of selection for sibling conflict.

Genetic Relatedness as a Protective Factor

Although family violence occurs at high rates, genetic relatedness was repeatedly identified as a protective factor. Multiple authors suggested step-parental neglect, abuse, and homicide toward stepchildren reflects either a by-product of the lack of parental solicitude stepparents' possess and/or an adaptation to prioritise one's own reproductive success (Daly & Wilson, 1998, 1996; Platek & Shackelford, 2006; Schlomer et al., 2011). Furthermore, the adaptation 'child-specific parental love' which should inhibit violence toward children, is not present (or, on average, is less present) in stepparents (Daly & Wilson, 1998). These ideas are in-line with Archer's (2012) theorising on the important role of Kin Selection Theory in family violence, based on the concept of inclusive fitness developed by Hamilton (1964). Salmon and Hehman (2014) used Kin Selection Theory as a basis for their prediction that greater conflict would be observed among half- or stepsiblings than genetic siblings. Finally, the presence of stepchildren is associated with increased rates of male perpetrated IPV, indicating it may place a negative stress on intimate relationships (Goetz & Romero, 2011).

Fast Life History Strategy

The relationship between a fast life history strategy and family violence came up several times in the theoretical literature. The general premise of life history theory is that individuals adopt either a 'fast' or 'slow' life history strategy based on cues of extrinsic mortality/morbidity such as environmental unpredictability and/or harshness. Figueredo et al. (2012a) explained that people with a 'fast' life history strategy put more investment in mating

effort rather than parental investment (as compared with a 'slow' life history strategy) and adopt a lifestyle of risk-taking, impulsive behaviour, casual sex, and decreased law-abidingness. Male perpetrated IPV is predicted to be a facultative adaptation of individuals adopting a fast LH strategy based on genetic factors (as LH has a heritability of $h^2 = 0.65$; Figueredo & Rushton, 2009) and exposure to unpredictable environments which are associated with developing an insecure attachment style (Figueredo et al., 2012a). Levesque (1997) proposed a similar hypothesis that family violence is a facultative adaptation to ecological instability.

Reproductive Value

Reproductive value (RV) was a concept that repeatedly appeared in the current literature and refers to an individual's contribution to their kin's fitness at different ages (Archer, 2012). Various authors suggested children are at greatest risk of filicide when they are younger and require a greater amount of parental investment (Archer, 2012; Daly & Wilson, 2000; Friedman et al., 2012). This was hypothesised as an adaptation of discriminative parental solicitude, in which parents differ in their allocation of resources toward offspring based on their likelihood of surviving and reproducing (Daly & Wilson, 2000). Children with disadvantageous characteristics such as defects/disabilities were predicted to be at greater risk of abuse or filicide than children with higher RVs (Daly, 1989; Daly & Wilson, 1998).

Lethal Violence as Pathology

A recurring theme was the conceptualisation of lethal violence as pathological. However, this was dependent on contextual factors and disputed by some authors. Friedman et al. (2012) claimed mentally abnormal cases of filicide were those committed by older mothers toward older children, while neonaticide by a young mother who lacked financial and social resources was adaptive due to the disadvantageous conditions. Starzomski and

Nussbaum, (2000) described domestic-homicide-suicide as often pathological based on the frequent association between domestic homicide-suicide and depression, severe stress, schizophrenia, morbid jealousy, and various other psychological disturbances. Interestingly, male-perpetrated intimate partner homicide was described by several authors as not pathological but rather a dysfunctionally extreme by-product of violent adaptations that usually serve as effective ways of influencing an individual's behaviour (Daly & Wilson, 1998; Wilson & Daly, 1998). By contrast, Chester and DeWall (2018) claimed even non-lethal partner violence should be considered pathological in certain instances due to neurological evidence linking traumatic brain injury with IPV perpetration. Finally, it must be noted that a paper that did not feature in the current sample (due to not specifically relating to family violence) suggested homicide is an adaptation itself, directly in opposition to the idea of lethal violence as pathology (Duntley & Buss, 2011).

Male Sexual and Familial Proprietariness

Male sexual and familial proprietariness was a repeatedly identified concept that refers to the proprietary mind-set that men have over their partner and children. Several authors hypothesised IPV was an adaptation to solve the recurring adaptive problem men face of paternity uncertainty, which is mediated by male sexual proprietary mechanisms (Daly, 2016; Goetz et al., 2008a; Kaighobadi et al., 2009; Wilson, 1989; Wilson & Daly, 1998) Cues of sexual infidelity or desertion were predicted to trigger the emotion of sexual jealousy, which in extreme cases could lead to non-lethal and lethal partner violence (Wilson, 1989). Manifestations of male sexual proprietariness include mate guarding, coercive tactics, controlling behaviour, sexual coercion, jealousy, and violence (Belsky, 2016; Kaighobadi et al., 2009; Platek & Shackelford, 2006). IPV was alternatively viewed by Belsky (2016) as either an adaptation or by-product of male sexual jealousy, functioning as an anti-cuckoldry tactic. Numerous other authors remained ambiguous as to whether they conceptualised

partner violence as an adaptation or a by-product (Buss & Duntley, 2011, 2014; Goetz & Romero, 2011). However, partner homicide was conceptualised as a maladaptive by-product of coercive control adaptations by Wilson and Daly (1998).

Archer (2012) claimed paternity uncertainty could not explain the similar rates of partner violence in Western studies, given paternity uncertainty is predictive of solely male perpetration. This conceptual problem is addressed by Cross and Campbell (2011; 2014) who conceptualised female perpetrated IPV as a by-product of reduced fear, which occurs due to factors such as increased oxytocin released within the female body during a relationship. Fear-inhibiting aggression is also predicted to be weaker in women in Western nations due to the decreased likelihood that men would retaliate based on the consequences such actions would bring them (Cross & Campbell, 2014). It is likely women do have a proprietary attitude toward men, however this is more salient in contexts where female safety is assured.

Familial-homicide (which is predominantly perpetrated by men) was predicted to reflect the proprietary mind-set that men have over their family (Wilson, 1989). Starzomski and Nussbaum (2000) explained domestic-homicide perpetrators typically have experienced familial discord and estrangement, reflecting a threat to their strong proprietary attitude toward their partner and children.

Table 4*Summarised Version of all Empirical Publications*

Document type, author, year	Explanatory target	Evolutionary conceptualisation	Unique ID	Description	Proposed psychological mechanism
Archival research D'Alessio, J. D, & Stolzenberg, L. (2012)	Genetic- vs. step- child abuse	Not specified, likely a by-product.	Stepchild abuse in disadvantaged communities	A multilevel analysis of child abuse incidents reported to police in 133 U.S. cities in 2005. The authors found in cities with high levels of community disadvantage stepchildren were more likely to suffer a physical injury in a child abuse incident than genetic children. This pattern was not observed in cities with low levels of community disadvantage. This finding is consistent with their hypothesis that stepchildren are prone to abuse because they do not carry the genes of their adoptive parents. Furthermore, this abuse would be exacerbated in contexts of scarce resources. Stepchild abuse best reflects a by-product of a stepparent's lack of parental solicitude and child-specific love, moderated by the availability of social and financial resources.	A lack of parental solicitude and 'child-specific love'
Archival research West, S. G. & Friedman, S. H. (2007)	Filicide	Adaptation in certain contexts or pathology (when mental illness present)	Filicide Theory	A review of published research or literature on filicide from the last few decades. One hypothesis is filicide may have been selected for under certain contexts. The authors also consider mental illness as playing an important role in the commission of filicide by both mothers and fathers. The postpartum period is considered a high-risk time for the exacerbation of psychiatric symptoms in women.	No clear mechanism presented; however mental illness associated with a failure in normal brain functioning

Experimental study	Male perpetrated Intimate Partner Violence (IPV)	Not specified. Likely an adaptation.	Female-directed violence associated with in-pair copulation frequency	The authors tested whether female-directed violence was associated with in-pair copulation frequency, and therefore, functions as a form of sexual coercion deployed by men to gain more frequent sexual access to their partner. The findings were consistent with this hypothesis, as the authors found physically violent men secured more in-pair copulations than non-violent men. In addition, the average monthly rate of female-directed violence was positively correlated with in-pair copulation frequency. Such findings suggest an adaptive selection for violent/aggressive traits in men that facilitate sexual access by using force to overcome female resistance.	Not developed fully, potentially a sperm competition mechanism
Barbaro, N., & Shackelford, T. K (2016)					
Archival research	Filicide (biology and step- parent)	Context dependent. Adaptation or by-product (stepfathers); pathology (suicidal genetic fathers)	Discriminative parental solicitude	The authors reviewed literature on step-paternal vs. genetic paternal homicides in Canada. Finding indicated stepfathers killed children at a higher rate than genetic fathers and used more painful methods such as beating to death that seemed to reflect rage or hostility. Genetic fathers were more likely to shoot or asphyxiate their victims and commit suicide afterwards. Findings best reflect a failure of parental solicitude in genetic fathers with potential mental illness (suicide post-homicide and the misbelief of 'rescuing' their child by killing them). By contrast, an adaptive lack of parental solicitude in stepfathers is proposed.	Parental solicitude, lack of solicitude in stepparents
Daly, M. & Wilson, M. (1994)					
Experimental study	Intimate Partner Violence (IPV) toward pregnant partners	Not specified, presumably a by-product.	Female-directed violence during pregnancy	The authors examined domestic violence patterns in 258 men convicted of spouse abuse. Findings indicated approximately one out of seven respondents admitted committing violent acts towards their partner while she was pregnant. The frequency and severity of abuse toward pregnant partners was almost double that directed toward partners who were not pregnant. Findings presumably reflect a by-product of heightened paternity uncertainty and associated jealousy and abuse during a partner's pregnancy.	Male sexual jealousy
Burch, R. L., & Gallup, G. G., Jr. (2004)					

Correlational study	Homicide and child maltreatment	By-product	Life History Theory	The current experimental study was designed to test whether Life History Theory (LHT) is a better explanation for homicide, child maltreatment, and family ties than Pathogen Stress Theory (PST). PST is the idea that environmental pathogen loads play an important role in shaping behaviours and value systems. Various cross-sectional studies have supported the link between pathogen stress and antisocial behaviour. However, the current authors questioned the causal relationship between PST and such behaviour. They conducted a cross-sectional analysis that found by removing the effects of life history variables (early childbirth as a fast life history proxy and race as an extrinsic risk proxy) little effects were found of STD rates (or other pathogen risk measures) on variables such as homicide and child maltreatment. The authors conceptualise STDs (which correlate with antisocial behaviour) as a by-product of faster life history strategies rather than a driver of specific behavioural adaptations.	Impulsivity and antisociality triggered by environmental conditions of uncertainty and unpredictability
Hackman J. & Hruschka D. (2013)					
Archival research	Filicide by genetic parents vs. stepparents	Depends on specific child-parent relationship and context, but suggests filicide can reflect adaptation, by-product and/or pathology	Parental investment theory	An examination of the differences between genetic parents versus stepparents in 378 cases of child homicide in Canada. Findings indicated filicides were more common among stepparents than genetic parents, consistent with previous research. In addition, infants were at greatest risk of filicide, especially by genetic mothers. The killing of older children by genetic mothers was often associated with mental illness. Finally, slower methods of killing such as death by beating were observed more in stepparents than genetic parents. Filicide perpetrated by stepfathers and mothers best reflects a lack of parental solicitude; infant filicide perpetrated by genetic mothers reflects adaptation for better allocation of maternal resources; filicides perpetrated by genetic mothers against older children best reflects pathology.	Parental solicitude; mechanisms underlying parental manipulation (but no specific details)
Harris, G. T., Hilton, N. Z., Rice, M. E., & Eke, A. W. (2007)					

Experimental study	Female perpetrated Filicide	Adaptation (neonaticide); Pathology (infanticide and filicide)	Maternal filicide	The authors examined a sample of 110 Italian mothers who committed neonaticide, infanticide, or filicide to identify whether the between-group differences were in-line with evolutionary predictions. Findings indicated women who committed neonaticide were predominantly young, poor, had no partner, and displayed no signs of psychopathology. Mothers who committed infanticide or filicide did not significantly differ in their general characteristics, most of whom displayed psychopathology, suicide or attempted suicide after killing their children. Findings best reflect neonaticide as an adaptive reproductive disinvestment strategy, while maternal infanticide and filicide are conceptualised as improper functioning of normal adaptations generally due to some form of psychopathology.	Gradual development of parent-to-offspring bond, infanticide and filicide as failures of parental solicitude due to pathology in brain functioning
Camperio Ciani, A. S. & Fontanesi, L. (2012)					
Archival research	Familicide	By-product	Familicide	Familicide incidents are examined from Canadian and British national homicide archives. The authors found familicides were predominately perpetrated by men, approximately half of all perpetrators committed suicide afterwards, and stepchildren were overrepresented as familicide victims. Perpetrators of filicide were found to have more in common with uxoricide than filicide offenders, with a male proprietary mindset over a man's wife and children hypothesised to play a key role. Familicide itself was conceptualised as a dysfunctionally extreme by-product of violent adaptations that are effective at influencing a victim's behaviour.	Male familial proprietariness
Wilson, M., Daly, M., & Daniele, A. (1995)					

Experimental study	Male perpetrated Intimate Partner Violence (IPV)	Not specified, likely an adaptation	Sex ratio dependent male-on-female IPV	Data from the Federal Bureau of Investigation's National Incident-Based Reporting System (NIBRS) was examined to investigate whether sex ratio influenced the rate of male-on-female IPV. The authors found a high sex ratio (more males than females) was associated with increased male-on-female IPV, in line with predictions from evolutionary psychology (EP). EP argues sexual competition among males for females engenders sexual jealousy, which in turn leads to increased IPV. In addition, male-on-female IPV is viewed as a mechanism of control used by men to help ensure the sexual fidelity of their female mates, decreasing the chances of cuckoldry occurring. The authors also found higher rates of male-on-female IPV in cities where more women worked, further supporting the logic of EP that participation in the workforce gives women more opportunity to meet/interact with other men. Current findings reflect a facultative adaptation of partner violence in contexts of greater male sexual competition.	Male sexual jealousy - sensitive to cues of increased risk of infidelity such as presence of viable mate poachers
D'Alessio, J. D, & Stolzenberg, L. (2010)					
Experimental study	Genetic child vs. step-child filicide	Not specified, presumably dependent on child-parent relationship as to whether it is a lack or failure of adaptive mechanisms.	Discriminative parental solicitude	A replication and extension of the research by Daly and Wilson (1994) in a U.S population. The authors found the same patterns of results, with higher rates of beating and bludgeoning to death by stepparents, and more painless approaches such as asphyxiation by genetic parents. Similar differences were also observed in the methods used by stepmothers and genetic mothers. The authors conclude there are qualitatively different motives driving filicide by stepparents versus genetic parents. Findings suggest step-parental filicide reflect a lack of parental solicitude, while filicide by genetic parents are failures in adaptive solicitude mechanisms.	Parental solicitude, lack of solicitude or child-specific love in stepparents
Weekes-Shackelford, V. A. & Shackelford, T. K. (2004)					

Archival research	Male perpetrated Intimate Partner Violence (IPV)	Adaptation	Male sexual proprietariness theory	Evidence is collected regarding the prevalence and manifestation of sexual jealousy among men. Reviews of adultery law indicate sexual intercourse between a married woman and a man who is not her husband is an offence, with the victim being the woman's husband. These cross-cultural and historic laws are consistent with the idea that women's sexual behaviour must be controlled to ensure men maintain their paternity confidence. Reviews of homicide data found male sexual jealousy was a leading cause of sexual conflict homicides in Detroit. In addition, forms of coercive constraint of women include violence and genital mutilation across various societies that function to control female sexuality. The authors suggest that the universality of male sexual jealousy indicate it is an evolved psychological adaptation.	Male sexual proprietariness
Daly, M., Wilson, M. I., & Weghorst, S. J. (1982)					
Archival research	Uxoricide in pregnancy	Not specified, likely a by-product	Female-directed violence during pregnancy	A study of ancient Greek depictions of violence during pregnancy from an evolutionary perspective. The authors do not claim such depictions reflect any indication of prevalence rates of partner violence or uxoricide in those days. Instead, the myths and anecdotes are viewed as reflections of male anxieties about female power over reproduction. Themes of sexual jealousy and paternity uncertainty are identified in the Greek texts and are consistent with modern-day causes of partner violence and uxoricide. Uxoricide is likely a by-product of heightened male sexual jealousy and paternity uncertainty during their partner's pregnancy.	Male sexual proprietariness, key role for jealousy
Deacy, S., & McHardy, F. (2013)					

Experimental study	Sibling conflict	Sibling aggression/violence selected for (adaptation) to obtain fair/greater share of parental resources; Siblicide (by-product) of selection for sibling conflict	Sibling Conflict Theory, Kin Selection Theory	An empirical test of the evolutionary predictions made by Salmon and Hehman (2014). The authors examined reports of sibling conflict in 345 young adults. Findings indicated the most intense conflict was between same sex-siblings, likely due to being in competition for the same resources. In addition, greatest conflict was between non-biological siblings, the least was with half-siblings, and full siblings were in the middle. This partially supported their prediction based on Kin Selection Theory that greater relatedness should decrease conflict between siblings. In addition, the authors predicted greater duration of co-residence would foster a sense of sibship and be associated with decreased conflict, however the opposite pattern was found. Siblicide was not examined. More research is needed in this area to delineate these findings.	Mediating mechanisms possibly include sensitivity to amount of parental investment; ownership of resource; degree of relatedness; perceived needs of siblings (birth order/spacing)
Experimental study	Male perpetrated Intimate Partner Violence (IPV) and child abuse	Adaptation	Competitive disadvantage theory	The current study explored the idea that coercive sexual and parental strategies represent conditional or alternative mating and parental strategies that are disproportionately utilised by competitively disadvantaged males (CDMs). The authors hypothesised that the dominant or “normal” species-typical strategies are somehow less effective or available to such men (due to a specific sexual or socioeconomic disadvantage they possess), making an alternative coercive strategy the optimal approach for CDMs. Findings indicated men’s coercive sexual and parental strategies were inversely proportional to their sexual capital in the relationship, directly proportional to their genetic capital in the family, and indirectly related to their financial capital. Familial coercion is conceptualised as a facultative adaptation in men who lack the resources or characteristics to maintain a mate through normal methods.	Male coercion mechanisms calibrated to resource and attractiveness aspects of man, sexual jealousy - sensitive to mate value discrepancies

Experimental study	Intimate Partner Violence (IPV) as a mate retention tactic in married couples	Adaptation	Sex differentiated mate-retention	A study of mate retention in married couples. As hypothesised, men's, but not women's, mate retention was higher when their wife was rated more youthful and attractive. By contrast, women's, but not men's, mate retention was higher for husbands with greater income and status striving. Findings support the evolutionarily based importance men place on women's reproductive value compared with women's preference for men who can readily provide for them. Men, more than women, used resource display, submission and debasement, and intrasexual threats to retain their mates. Women were more likely to use verbal signals of possession and appearance enhancement. Partner directed violence may reflect an escalation of mate-retention tactics that evolved to solve the problem of partner infidelity (physical or resources) or desertion. This is facultative (sensitive to resources and/or reproductive value of partner).	Sex differentiated jealousy
Buss, D. M, & Shackelford, T. K. (1997)					
Archival research	Male partner directed violence	Adaptation	Reproductive value theory	This study examined the hypothesis that male partner directed violence evolved to solve the adaptive problems of mate infidelity and paternity uncertainty. It was predicted to be sensitive to age and hence reproductive value of one's partner. Data was collected from US police reports from 1986 to 1999, and findings supported these hypotheses. Rates of IPV decreased substantially as women approached 45 years of age. Younger women were at greatest risk of IPV than older women by both older and young male partners.	Proprietary jealousy
Peters, J., Shackelford, T. K., & Buss, M. D. (2002)					
Experimental study	Women's preferences for aggressive and formidable mates	Adaptation	Women's preferences for aggressive and formidable mates	The current study of 1048 US women examined patterns in their preferences for long-term mates who are aggressively dominant and physically formidable. The authors found women who perceived themselves as vulnerable to crime predicted their preference for aggressive and formidable mates. This is hypothesised to reflect a cost-benefit analysis in which the benefits of receiving protection from their partner in contexts of high crime rates or general harm outweighed the cost of coercion	Mate preference mechanisms facultatively calibrated to environmental conditions of violence and unpredictability
Snyder, J. K., Fessler, D. M. T., Tiokhin L., Frederick, D.					

A., Lee, S. W., & Navarrete, C. D. (2011)				and violence they may be at risk of experiencing at the hands of their partner.	
Experimental study	Intimate Partner Violence (IPV)	Not specified, presumably adaptation	Life History Theory	The authors examined whether unpredictability in childhood would negatively influence romantic attachment and subsequent IPV rates, reflecting a fast life history strategy. They hypothesised: unpredictability in childhood would be associated with greater anxious attachment; anxious attachment would be associated with intimate partner violence (IPV) perpetration, and anxious attachment would mediate the relationship between unpredictability in childhood and IPV perpetration. These hypotheses were generally supported for men, but not women. The findings suggest environmental risk in childhood is associated with a faster life history strategy that negatively impacts adult romantic relationship outcomes, particularly among men. Findings presumably reflect a facultative adaptation of partner violence as a consequence of unstable early childhood experiences.	Anxious attachment style, impulsivity and antisociality based on early conditions of unpredictability/harshness
Barbaro, N. & Shackelford, T. K. (2019)					
Experimental study	Intimate Partner Violence (IPV)	Not specified, possibly an adaptation/by-product	Competitive disadvantage theory, Life History Theory	An experimental study of predictors of IPV perpetration in Nicaragua. The authors examined the role of possessive jealousy, intrasexual competitiveness, life history strategy, mate value, and stress on rates of IPV perpetration. Contrary to predictions, possessive jealousy was not related to IPV among men or women. Instead, among men, IPV was predicted by a fast life history strategy, intrasexual competitiveness, low mate value, and stress. Partner violence was only predicted by intrasexual competitiveness among women. These findings suggest causes of partner violence are qualitatively different between men and women. The low mate value finding potentially reflects a facultative adaptation in men who lack the resources or	Male coercion mechanisms calibrated to resource and attractiveness aspects of man, impulsivity and antisociality based on early conditions of unpredictability/harshness
Buunk, A. P. & Massar, K. (2019)					

				characteristics to maintain a mate through normal methods. Alternatively, IPV may be a by-product of the less well-developed executive functioning and long-term thinking abilities associated with a fast life history strategy.	
Experimental study	Intimate Partner Violence (IPV)	Adaptation	Life History Theory	Reiterations of ideas by Figueredo et al. (2012a) regarding the importance of Life History (LH) theory as an explanatory framework for IPV. The authors integrated LH theory with “hot/cool” systems theory of self-regulation to predict behaviours such as IPV and interpersonal aggression (IPA). This theory is based on the idea that cool analytic-cognitive systems specialise in regulating planned behaviour, while hot-cognitive systems specialise in generating impulsive stimulus-triggered behaviour. The findings indicated the relations among LH strategy, IPV, and IPA are indirect and mediated by an interplay between cool and hot cognitive systems. A cool cognitive process such as executive functioning was considered an important inhibitory mechanism of IPV, which individuals who use a fast LH strategy often do not possess. The authors conceptualise IPV as a tactic deployed in the service of an overall adaptive strategy that is possibly more consistent with faster than slower life history strategies.	Low executive functioning, impulsivity, antisociality based on early conditions of unpredictability/harshness
Figueredo, A. J., Jacobs, W. J., Gladden, P. R., Bianchi, J., Patch, E. A., Kavanagh, P. S., ... & Li, N. P. (2018)					
Experimental study	Intimate Partner Homicide	Not specified. Presumably a by-product.	Male sexual proprietariness theory	An examination of over 50,000 intimate partner homicides to observe what percentage of such homicides are by beating (a hands-on method of killing) in relation to their relationship status and sex. Findings indicated that men were more likely to kill their partner by beating, and this was at increased risk when their relationship status was dating or non-marital cohabiting (versus legal marriage). Partner (versus wife) homicide likely reflects a by-product of the increased jealousy men experience in a non-marital union due to the greater lack of commitment in such relationships.	Male sexual jealousy
Mize, K. D., Shackelford, T. K., & Shackelford, V. A. (2009)					

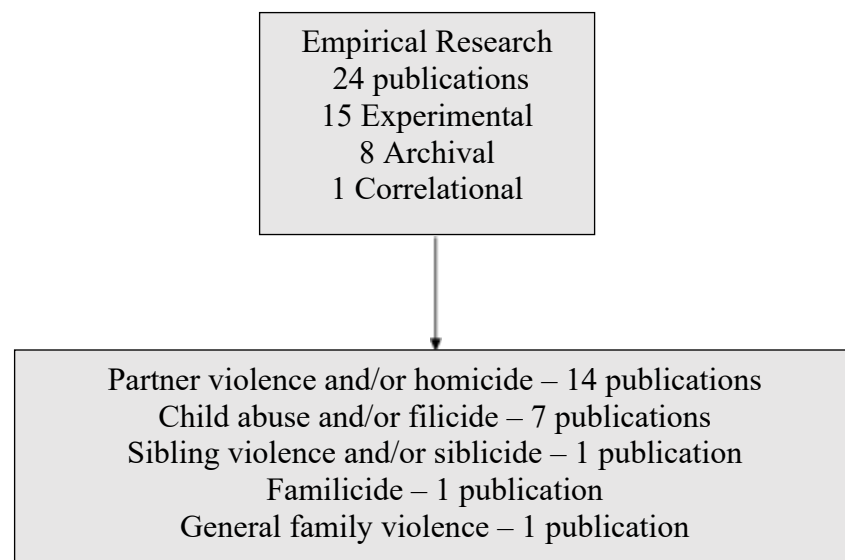
Experimental study	Intimate Partner Violence (IPV)	Not specified. Possibly a variety of adaptations	Male sexual proprietariness theory, reproductive value, competitive disadvantage theory	A study of sex-specific biological cues to mate guarding behaviour in a British population. The authors found rates of controlling behaviour was similar in men and women, consistent with previous studies. However, this finding is inconsistent with the evolutionary perspective that control is based only on male proprietary attitudes towards women, functioning to decrease chances of cuckoldry. In addition, controlling behaviour was associated with physical aggression in both sexes. Female fecundity was found to significantly predict men's controlling behaviour, consistent with reproductive value theory. Finally, controlling behaviour and physical aggression was associated with individuals of lower mate value among both men and women, in-line with competitive disadvantage theory. Best reflects facultative adaptations to cues of own and partner's reproductive value (age, attractiveness).	Control mechanisms calibrated to one's own resource, attractiveness, and age and that of their partner's
Graham-Kevan, N. & Archer, J. (2009)					
Experimental study	Intimate Partner Violence (IPV) perpetration and victimisation	By-product	Life History Theory	The current study used Life History (LH) reasoning to examine the effects of early harshness and unpredictability on IPV perpetration and victimisation. Findings showed experiences of unpredictability during the first five years of life was predictive of both IPV perpetration and victimisation in adulthood. IPV perpetration or victimisation is conceptualised as an unwanted consequence (by-product) of an adaptive shift toward a faster life history.	Impulsivity, antisociality, low executive functioning, associated with increased risk of partner violence
Szepeswol, O., Zamir, O., & Simpson, J. A. (2019)					

Synthesised Findings of Experimental Research

There were 24 empirical pieces of research included in this table, comprised of experimental studies, archival research, and one correlational study. The explanatory targets included: Partner violence and/or homicide (14 publications), child abuse and/or homicide (7 publications), sibling violence and/or homicide (1 publication), familicide (1 publication), and general family violence (1 publication). The current publications were examined as to how they fit into the overarching themes.

Figure 3

Proportion of Explanatory Targets within all Empirical Publications



Lack of Resources

A lack of resources was mentioned in several studies. D'Alessio and Stolzenberg (2012) found stepchildren were more likely to get abused than genetic children in disadvantaged communities, while this pattern was not observed in wealthier communities. This was consistent with their hypothesis that stepchild abuse would be pronounced in social contexts where resources were scarce as stepparents' unwillingness to invest in non-kin would be exacerbated (D'Alessio & Stolzenberg, 2012). Similarly, Ciani and Fontanesi (2012) found women who committed neonaticide were predominantly young, poor, had no

partner, and displayed no signs of psychopathology. This was consistent with the theoretical perspective of neonaticide being an adaptive disinvestment strategy in impoverished contexts (Ciani & Fontanesi, 2012). Finally, Salmon and Hehman (2015) found greater conflict was observed between same-sex siblings, consistent with the notion that they are likely in competition for the same limited resources.

Genetic Relatedness as a Protective Factor

Genetic relatedness served as a protective factor in numerous empirical studies. Daly and Wilson (1994) found stepfathers killed children at a higher rate than genetic fathers in a Canadian sample. Interestingly, the methods of killing were different between stepfathers vs. genetic fathers, with stepfathers using more painful methods such as beating to death while genetic fathers were more likely to shoot or asphyxiate their victims (Daly & Wilson, 1994). Similar patterns were observed by Weekes-Shackelford and Shackelford (2004), and appear to reflect different motivations for killing, such as bitterness and resentment driving step-paternal homicide. D'Alessio and Stolzenberg (2012) similarly found stepchildren were at greater risk for abuse than genetic children, however this pattern was only observed in disadvantaged communities. By contrast, sibling conflict was found to be greatest with nonbiological siblings, least with half-siblings, while full siblings experienced medium levels of conflict (Salmon & Hehman, 2015). This only partially supported the relatedness hypothesis as full siblings were predicted to be the most harmonious pairing. Future research on sibling violence is needed to address these findings.

Fast Life History Strategy

A fast life history strategy was discussed and examined by several authors. Early childhood experiences of a harsh and unpredictable environment were associated with anxious attachment styles and both IPV perpetration and victimisation (Barbaro & Shackelford, 2019; Szepeswold et al., 2019). Snyder et al. (2011) found women who

perceived themselves as vulnerable to crime had a preference for aggressive and formidable mates, potentially reflecting their own childhood instability putting them at risk for IPV victimisation. Buunk and Massar (2019) demonstrated fast life history variables were predictive of IPV perpetration, while Figueredo et al. (2018) identified a mediating role of low self-regulation in increasing the risk of IPV perpetration and interpersonal aggression. Finally, Hackman and Hruschka (2013) identified extrinsic risk proxies (early childbirth and race) which were indicative of fast history strategies were associated with STD rates and more predictive of homicide and childhood maltreatment than variables predicted by pathogen stress theory.

Reproductive Value

Reproductive value (RV) was touched on in terms of both filicide and partner violence. Several authors found infants were at greatest risk for filicide compared with older children (Ciani & Fontanesi, 2012; Harris et al., 2007). This is consistent with the hypothesis that age is negatively correlated with child abuse due to young age reflecting a child's lower RV and a less well-developed parent-to-offspring bond (Archer, 2012). Women's RV declines rapidly as their fertility decreases with age, and Peters et al. (2002) found in their US sample that young women were at greatest risk for IPV victimisation compared with older women, including when partner's age was controlled for. Graham-Kevan and Archer (2009) similarly found female fecundity was a significant predictor of men's controlling behaviour. Furthermore, Buss and Shackelford (1997) found mate retention tactics were higher among men and women when their partner had a high RV. Competitive disadvantage theory was supported by two studies which found low mate value predicted IPV perpetration and controlling behaviours in men and women (Buunk & Massar, 2019; Graham-Kevan & Archer, 2009).

Lethal Violence as Pathology

There were varied opinions regarding whether lethal violence was pathological or not. One review article conceptualised mental illness as playing an important role in the commission of filicide, with the post-partum period being a high-risk time for women's pre-existing psychiatric symptoms (West & Friedman, 2007). Contrastingly, several authors found mothers who committed neonaticide displayed no signs of psychopathology, while the killing of older children by genetic mothers was associated with psychopathology, suicide or attempted suicide after killing their children (Ciani & Fontanesi, 2012; Harris et al., 2007). By contrast, Wilson et al. (1995) conceptualised familicide as a dysfunctionally extreme by-product of violent adaptations. However, half of all perpetrators committed suicide after committing filicide, indicative of some form of mental disturbance (Wilson et al., 1995).

Male Sexual and Familial Proprietariness

A male sexual and familial proprietary mind-set was identified in various studies. Daly et al. (1982) found cross-cultural and historic laws that repeatedly indicated women's sexual behaviour must be controlled to ensure men maintain their paternity confidence, while cultural practices such as genital mutilation functioned to control female sexuality. One study found a high sex ratio (more males than females) was associated with increased male-perpetrated IPV, suggested to be the result of mate-guarding behaviour increasing with the heightened sexual competition (D'Alessio & Stolzenberg, 2010). Peters et al. (2002) found women were at greater risk for partner violence when they were younger, consistent with predictions that mate-guarding behaviour is sensitive to women's fertility and men's risk of cuckoldry. In addition, pregnancy was associated with partner violence, potentially reflecting increased paternity uncertainty/suspicion in male partners during this time (Burch & Gallup Jr., 2004; Deacy & McHardy, 2013).

Contrary to predictions, possessive jealousy was not found to influence partner violence in a sample of Nicaraguan men (Buunk & Massar, 2019). However, low mate value

did significantly predict partner violence, in-line with competitive disadvantage theory (Buunk & Massar, 2019). Figueredo and McCloskey (1993) had similar findings consistent with competitive disadvantage theory, with men's coercive sexual strategies inversely proportional to their sexual capital in the relationship, and directly proportional to their genetic capital in the family. Heightened proprietary behaviour among competitively disadvantaged males may reflect a response to their greater risk of being deserted or cuckolded (Figueredo & McCloskey, 1993). Finally, Wilson et al. (1995) found familicides were predominantly committed by men and perpetrators had more similarities with men who committed uxoricides than filicides, with a proprietary attitude predicted to be a possible causal factor

Table 5*Summarised Version of all Commentaries*

Document type, author, year	Explanatory target	Evolutionary conceptualisation	Unique ID	Description	Proposed psychological mechanism
Commentary Kaighobadi, F. & Shackelford, T. K. (2009)	Male partner directed violence; Forced in-pair copulation	Adaptation	Male sexual proprietariness theory	The current commentary is on Archer's (2009) article that suggests sex differences in partner violence is best explained through between-sex differences in reproductive strategies and the influence of social roles. The authors agree that sexual selection theory has a place in explaining sexual conflict and between-sex aggression, however they believe a more relevant explanation is men's partner-directed violence as an evolved solution to the adaptive problem of paternity uncertainty and female infidelity. Forced in-pair copulation is selected in response to perceived infidelity to reduce risk of cuckoldry.	Not developed fully, but key role for male sexual jealousy
Commentary Daly, M. & Wilson, M. (2005)	Genetic child vs. stepchild abuse	Not specified, possibly a by-product based on authors' previous hypotheses	Stepchild abuse	This commentary is in response to Buller's (2005) article that claims stepchildren are not disproportionately mistreated in comparison to genetic children. The current authors state that Buller (2005) misrepresented the content of every study he cited and simply discredited research findings that supported the 'Cinderella effect'. The authors do not make any conceptual hypotheses.	Not discussed, likely parental solicitude, lack of solicitude in stepparents
Commentary Daly, M. & Wilson, M. (1991)	Genetic child vs. stepchild abuse	By-product	Stepchild abuse	The current commentary is in response to Gelles (1991) article that claims stepchildren are not disproportionately abused. Gelles (1991) cites their own study that found no between-group differences to support their hypothesis. However, the current authors demonstrate numerous other studies have found a clear link between lack of genetic relatedness and abuse, thus rebutting Gelles' argument. The authors claim although child abuse may not exhibit design features required to be deemed an adaptation, the psychological mechanism	Discriminative child-specific parental solicitude

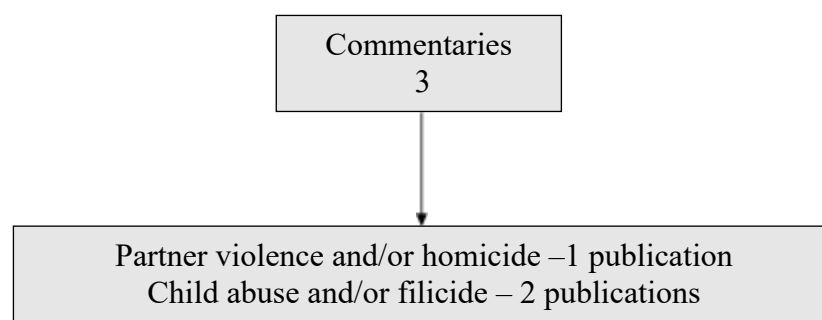
discriminative child-specific parental solicitude does (indicating child abuse is likely a by-product).

Synthesised Findings of Commentaries

There were three commentaries included in the current review. The explanatory targets included partner violence and/or sexual coercion, and stepchild abuse. Given there were only three commentaries, these were briefly touched on as to how they fit into the overarching themes.

Figure 4

Proportion of Explanatory Targets within all Commentaries



The commentary by Kaighobadi and Shackelford (2009) questioned Archer's (2009) explanation for IPV through sexual selection theory and instead suggested IPV is best understood as an evolved solution to the adaptive problem of paternity uncertainty. Men's partner-directed violence and sexual coercion was hypothesised to prevent or punish partner infidelity (Kaighobadi & Shackelford, 2009). This commentary falls under the theme of 'male sexual and familial proprietariness', as a lack of paternity certainty was predicted to increase men's proprietary mind-set.

The subsequent two commentaries pertain to articles by Buller (2005) and Gelles (1991) that suggest stepchildren are not disproportionately abused in comparison to genetic children. Daly and Wilson (1991, 2005) refute these claims and provide evidence that supports the 'Cinderella Effect' being a true phenomenon. These commentaries fall under the theme of 'genetic relatedness as a protective factor', as the authors suggest child abuse is an increased risk for non-genetic offspring.

Chapter Six: The Fundamental Motives Framework

A potentially valuable approach to conceptualising family violence in a more coherent and clear manner is through the lens of motivation. The primacy and thus importance of motivation lies in the hypothesis that any behaviour or psychological process is preceded by motivational systems that support an organism's survival and reproductive goals (Baumeister, 2016). The current chapter uses literature on motivation to inform the development of a Fundamental Motives Framework. This is subsequently applied to the context of family violence.

From an evolutionary perspective, motivation is not simply conceptualised as a subjective experience (such as meeting needs or achieving goals) but is rooted in evolved systems that regulate behavioral interactions with other organisms and one's external environment (Beall & Schaller, 2019; Schaller et al., 2017). Motivation works to orient an individual's behaviour toward biologically significant goals, regardless of whether the person is consciously aware of such pursuits (Del Giudice, 2018). A key component of this approach is the principle of functional modularity (Tooby et al., 2008). This recognises that humans possess psychologically different motivational systems, reflecting a variety of selection pressures that work to solve different reproduction-relevant problems (Schaller et al., 2017).

Another important concept for understanding motivational systems is the role of emotions. Various authors suggest emotions work as superordinate psychological mechanisms that coordinate or trigger the activity of other mechanisms (Al-Shawaf et al., 2016; Del Giudice, 2018). For example, fear activates physiological responses such as changes in respiration, circulation, and digestion (Del Giudice, 2018). Aunger and Curtis (2015) claim emotions are motivated behavior designed to obtain end-states that enhance one's reproductive or survival outcomes. As an illustration, the meeting of a need is often followed by a neurochemical release in the brain that produces a feeling of well-being, which

reinforces future need/goal seeking behaviour (Aunger & Curtis, 2015). Similarly, Ward and Carter (2019) view motivational systems as indirectly influencing behaviour by triggering emotions which coordinate subsequent responses. Furthermore, Beall and Tracy (2017) suggest specific motivational systems are generally associated with specific emotional experiences, thus indicating the importance of recognising '*motivational-emotional systems*' when examining behaviour through a motivational lens.

There is much debate regarding how to define and quantify motivational-emotional systems. One approach by Kenrick et al. (2010) was to adapt Maslow's (1943) classic pyramid of needs into an evolutionary-based hierarchy of fundamental human motives. This updated pyramid incorporates the notion of developmental priority in relation to life-history theory, recognising that motivational priorities change with human development (Kenrick et al., 2010). In addition, life history priorities involve trade-offs between investing in survival, growth or reproductive efforts (Kenrick et al., 2010). Cognitive priority was another important concept touched on by Kenrick et al. (2010), as proximate or contextual cues influence which motivational system should be active at a specific point in time. The proposed pyramid has a total of seven systems, starting at the bottom with immediate physiological needs and going up through to self-protection, affiliation, status/esteem, mate acquisition, mate retention, and parenting (Kenrick et al., 2010). These systems reflect the combination of both survival and reproductive goals, with an understanding that survival goals undergird reproductive goals (Kenrick et al., 2010). Furthermore, although Kenrick and colleagues' (2010) motivational systems have a hierarchical structure like Maslow's (1943) pyramid, they differ in that they recognise that an individual does not 'out-grow' motives as they develop; rather new ones come 'online' (e.g., mating or parenting at reproductive maturity).

By contrast, Del Giudice (2018) proposed 14 motivational-emotional systems that include the aggression, fear, security, disgust, status, mating, attachment, caregiving, pair bonding, affiliation, reciprocity, acquisition, play, and curiosity systems. A similar set of motivational-emotional systems are devised by Aunger and Curtis (2013) who describe 15 distinct motives and the niche-based problem that each motive has evolved to solve. Finally, Ward and Carter (2019) developed 11 motivational-emotional systems that are based on those proposed by Del Giudice (2018) with several small modifications and the collapsing of a few overlapping systems. The current family violence literature will be mapped onto Ward and Carter's (2019) motivational-emotional systems. One reason for following Ward and Carter's (2019) framework is that it was specifically developed in the context of explaining crime and crime-related phenomena. These systems are briefly described below, with the inclusion of their associated emotions or feeling states (Aunger & Curtis, 2013; Del Giudice, 2018). Table 1 also recognises how the motivational-emotional systems of Ward and Carter (2019) can be drawn more generally from the basic motivations proposed by Kenrick and colleagues (2010).

Motivational-Emotional Systems

Bodily Regulation System

This system functions to ensure survival by acquiring metabolic resources (such as fluids and nutrition) and maintaining bodily integrity (for example seeking warmth, sleep and avoiding pain; Ward & Carter, 2019). Characteristic emotions or feeling states associated with this system include hunger, pain, and thirst (Aunger & Curtis, 2013; Del Giudice, 2018).

Aggression System

The aggression system functions to counter threats (either imminent or future) to oneself or loved ones through some form of aggressive action such as threatening or inflicting harm. This system may also involve the proactive pursuit of social status or

dominance (Ward & Carter, 2019). Relevant emotions or feeling states include anger, rage, excitement, relief and fear (Del Giudice, 2018).

Fear and Security Systems

The role of the fear system is to avoid or escape from immediate threat, while the security system functions to detect and respond to potential threats. Dysfunction in this mechanism could result in the production of false alarms, in which fear is activated frequently including in contexts where no external threat is present (Ward & Carter, 2019). Fear, anxiety, relief, panic and shock are common emotions or feeling states associated with these systems (Del Giudice, 2018).

Disgust System

Disgust works to ensure people avoid contact with pathogens and/or toxins such as rotting food or waste products (pathogen disgust), diseased or genetically related individuals, or undesirable sexual contacts (sexual disgust) or perceived moral violations (moral disgust). Dysfunction of this system includes obsessive compulsive behavior. Relevant emotions or feelings are disgust, repulsion, nausea, shame, and guilt (Del Giudice, 2018; Ward & Carter, 2019).

Status System

The role of the status system is to motivate individuals to compete for high status, and subsequently maintain and display this desired status. Higher social status is associated with increased access to material and symbolic resources (Ward & Carter, 2019), and in evolutionary terms greater reproductive success (Von Rueden & Jaeggi, 2016). Associated emotions or feelings include ambition, anxiety, envy, confidence and frustration (Del Giudice, 2018).

Mating System and Pair Bonding System

The mating system refers to finding, attracting, selecting sexual partners and engaging in sexual intercourse, while the pair bonding system focuses on forming and maintaining long-term relationships with sexual partners (Del Giudice, 2018). The mating system is more associated with emotions/feeling such as lust or excitement while pair bonding is linked to romantic love, joy, and jealousy (Del Giudice, 2018).

Attachment System and Caregiving System

These systems function to obtain care and support from a caregiver, or to provide such support to one's children or loved ones (Ward & Carter, 2019). Emotions or feeling states associated with these systems include parental love, tenderness, solicitude, anxiety, joy, and sadness (Del Giudice, 2018).

Affiliation System

The affiliation system motivates individuals to form and maintain strong relationships with group members. Greater social networks are associated with increased cooperativeness among group members and more opportunity to enhance one's knowledge and skills (Ward & Carter, 2019). Associated emotions and feelings are sympathy, loneliness, joy, and belonging (Del Giudice, 2018).

Reciprocity and Acquisition Systems

The reciprocity system functions to identify cooperative partners and determine whether an interaction or trade with others is fair. This system is sensitive to the detection and punishment of cheaters (Ward & Carter, 2019). The acquisition system focuses on acquiring, accumulating and defending one's resources. Relevant emotions or feelings include trust, suspiciousness, envy, greed, joy, and satisfaction (Del Giudice, 2018).

Play System

The play system motivates individuals to obtain and develop social, physical, and cognitive skills and competencies in non-threatening settings. These abilities lead to

opportunities where individuals can display their skills. This may enhance their prowess, social attractiveness and promote social bonding (Ward & Carter, 2019). Associated emotions or feelings are excitement, engagement, and confidence (Del Giudice, 2018).

Curiosity System

This system motivates people to acquire knowledge about the world and attempt to understand human behavior. This can facilitate social groups to coalesce and support the formation and maintenance of loving relationships (Ward & Carter, 2019). Relevant emotions and feelings are curiosity, surprise, pride, and insight (Del Giudice, 2018).

Applying the Fundamental Motives Framework to Family Violence

There are numerous ways in which the mapping of offences onto the Fundamental Motives Framework could help in conceptualising, explaining, and understanding family violence. As observed in the results section, multiple authors failed to clearly state whether the explanatory targets they examined should be classified as adaptations, by-products or pathologies. Ambiguity was also observed in that the same explanatory targets were conflictingly depicted as adaptations by some authors, yet by-products or pathological by others. Furthermore, many authors focused on the *behaviour* of concern rather than identifying the underlying *psychological mechanisms*, which is arguably the most integral component of an evolutionary perspective (Sell, 2018).

The Fundamental Motives Framework can serve as a clear, coherent and standardised format which evolutionary scholars could use to map offending onto a variety of motivational systems that demonstrate the *functionality* of behaviour. This novel approach would also facilitate a general understanding of the literature for researchers who wish to draw from these publications but have little familiarity with evolutionary psychology. Motivational systems such as “aggression” and “caregiving”, for example, are likely to be more intuitive for non-evolutionary researchers and may better relate to existing bodies of psychological

research and theory. In addition, the recognition of multiple motivational-emotional systems at play in offending can provide a more fine-grained approach that better accounts for the heterogeneity observed in family violence. Numerous motivational-emotional systems can act in conjunction depending on an individual's goals/needs, contextual cues, and life history strategy. For example, the conceptualisation of filicide as an adaptation, by-product or pathology is dependent on the motivational-emotional systems at play and contextual factors, indicating how a motivational approach may provide a richer explanation of the offence and a preliminary indication of its aetiological basis. The mapping of family violence offences onto motivational-emotional systems is outlined below with Table 6 depicting a basic summary of all findings. Any motivational-emotional system that was deemed irrelevant for the specific explanatory target were excluded from the analysis. These included the affiliation, play, and curiosity motivational-emotional systems.

Male-Perpetrated Intimate Partner Violence (IPV), Sexual Coercion, or Homicide

Aggression System. The aggression system is not a particularly domain-specific motivational-emotional system, thus a specific fundamental motive that relates to aggression and is of relevance to male-perpetrated IPV is mate retention. One study in the review found men displayed higher (and more harmful) mate-retention tactics than women, particularly when their partner had a high reproductive value (they were young and attractive; Buss & Shackelford, 1997). This motive is linked to the emotion of jealousy, suggesting it is activated by cues of partner infidelity or desertion and in extreme cases leads to harmful mate-retention tactics.

Status System. An interesting finding in the literature was IPV perpetration rates are male-biased in non-Western countries, however gender-symmetric rates are observed in Western nations (Archer, 2012; Cross & Campbell, 2014). In non-Western countries there is less gender empowerment or equality which indicate men have higher status in society (Cross

& Campbell, 2014). Status/esteem is a strong fundamental need, and men may internalise this social norm and feel entitled to control or treat their partner as they wish, with the knowledge that partner violence is unlikely to be sanctioned by the state (Anderson et al., 2015). By contrast, competitively disadvantaged males who perpetrate IPV or sexual coercion are men of lower social status and are unable to obtain or maintain a mate due to their lack of sexual, social, or economic resources (Figueredo & McCloskey, 1993). Competitive disadvantage theory suggests these disadvantageous conditions make coercive sexual strategies a relatively more viable approach to mating, indicating how low social status in men may negatively influences their sexual relationships.

Mating System and Pair Bonding System. In terms of the mating system, several studies found a fast life history strategy was associated with an insecure attachment style and fewer self-regulation skills (Barbaro & Shackelford, 2019; Figueredo et al., 2018). These characteristics are predictive of greater investment in mating effort (rather than seeking long-term partners) and increased risk of partner violence (Szepeswöl et al., 2019). In addition, mating opportunities are not equally present all for all individuals. ‘Competitively disadvantaged males’ have fewer mating opportunities due to their lack of physical/sexual attractiveness and/or socioeconomic resources. The current literature found forced in-pair copulation was associated with ‘competitively disadvantaged males’ (Buunk & Massar, 2019; Figueredo & McCloskey, 1993). In such cases, coercive sexual strategies may function to obtain sexual gratification and potentially enhance one’s reproductive success, while also working to control their partner and decrease their chances of cuckoldry (Graham-Kevan & Archer, 2009).

With regards to pair-bonding, male perpetrated IPV or homicide was often linked to a male proprietary attitude. In such cases, men attempt to ensure paternity certainty with their pair-bonded mate through tactics such as mate guarding, forced in-pair copulation, and

general partner violence, which function to deter partner infidelity or desertion (Platek & Shackelford, 2006). These cases of partner violence were often mediated by the emotion of male sexual jealousy (Buss, 2013). One study found male-perpetrated partner homicide was more violent (beating to death) based on relationship status, with more violent homicides directed toward cohabiting partners than wives (Mize et al., 2009). Daly and Wilson (1988) similarly have found there is increased risk of homicide among cohabiting partners relative to married partners. This difference could reflect greater jealousy in cohabiting relationships due to less commitment or stability (Mize et al., 2009). Alternatively, the emotion romantic love may be more salient in marriages and serve as a buffer against violence/homicide, with cases of marital homicide reflecting a failure of this psychological mechanism.

Attachment System and Caregiving System. The attachment system not only refers to attachment between a parent and child but is also relevant for romantic relationships. The reviewed literature found a positive relationship between insecure or anxious attachment styles in men and partner directed violence (Barbaro & Shackelford, 2019; Figueredo et al., 2012a). These unstable attachment styles were linked to fast life strategies, triggered by early experiences of unpredictability and environmental harshness (Barbaro & Shackelford, 2019; Figueredo et al., 2012). These findings suggest a lack of exposure to stable attachment bonds with parents or loved ones can lead to a deficit in skills or abilities to maintain healthy relationships with partners, putting such men at risk of partner directed violence.

Female-Perpetrated Intimate Partner Violence (IPV)

Bodily Regulation System. Given one function of the bodily regulation system is to avoid pain, female perpetrated IPV may work as a self-defence/self-protection mechanism to avoid pain (e.g., physical abuse from one's partner; Chester & DeWall, 2018).

Aggression System. Several authors suggest aggression is less inhibited and thus more likely to manifest in women with intimate partners for a variety of reasons. These

reasons include decreased fear due to the release of oxytocin during a relationship and societal norms in Western nations of gender empowerment that indicate men will not retaliate harmfully to aggressive female behaviour (Cross & Campbell, 2011; Cross & Campbell, 2014).

Fear and Security Systems. The fear and security systems may serve to protect a woman in an abusive intimate relationship by triggering related emotions such as fear and apprehension and subsequent violent behaviour that function as self-protection mechanisms (Chester & DeWall, 2018). In addition, fear may be suppressed in women in the context of intimate partner relationships, as noted above (Cross & Campbell, 2011; Cross & Campbell, 2014).

Status System. The status system was relevant to one study in the review which found controlling behavior and physical aggression were higher among women of lower mate value, in line with competitive disadvantage theory (Graham-Kevan & Archer, 2009). This system is associated with lower social status and emotions or feeling states such as anxiety, envy, frustration and anger (Del Giudice, 2018). Such emotions may be salient and readily activated when a female is sensitive to her mate-value discrepancy, and thus uses controlling or violent tactics in attempt to deter her partner from abandoning her or being emotionally or sexually unfaithful.

Mating System and Pair Bonding System. The pair bonding system is strongly related to emotions of romantic love and jealousy. One study in the review found between-sex differences in jealousy, with female jealousy more strongly activated by a partner's emotional infidelity than sexual infidelity, while the reverse pattern was seen in men (Buss, 2013). This likely reflects sex-differentiated adaptive problems. Female perpetrated IPV may reflect the activation of jealousy and subsequent violence to punish or reduce the likelihood of partner infidelity or desertion (Graham-Kevan & Archer, 2009). In addition, importantly

from an evolutionary perspective, female perpetrated IPV may deter the diversion of resources away from the relationship to other women (Buss, 2013).

Attachment System and Caregiving System. Similar to findings on male perpetrated IPV, attachment style influenced rates of female directed partner violence. Barbaro and Shackelford (2019) found subjective unpredictability (measured through participants' subjective ratings of how disrupted their home life was based on early experiences such as their parents frequently changing jobs) in childhood was associated with anxious romantic attachment in women. Further analyses also showed anxious romantic attachment predicted perpetration of psychological aggression, sexual coercion, and physical assault (Barbaro & Shackelford, 2019). Negative emotions associated with the attachment motivational-emotional system such as anxiety, fear, and anger may be more readily triggered in women with anxious attachment styles and thus predispose them to harmful/violent actions toward their partner.

Child Abuse and/or Filicide

Disgust. Child sexual abuse was not reported on in the review, however evolutionary psychology literature suggests the disgust motivational-emotional system functions to promote incest avoidance as incest is associated with deleterious fitness outcomes (Antfolk et al., 2012). Stepparents however do not possess a disgust motive (or, at least, are less likely to experience disgust), demonstrating why higher rates of child sexual abuse are perpetrated by non-genetic than genetic parents (Finkelhor & Baron, 1986).

Mating System and Pair Bonding System. Cases of step-parental child sexual abuse toward prepubescent children likely reflect pathology or failures in the mate preference system, as this provides no fitness benefits for the stepparent. However, the mating system is arguably functioning within normal parameters if the stepchild is post-pubescent, and

associated emotions or feeling of lust, excitement, arousal or desire may automatically be activated in stepparents regardless of their intentions (Del Giudice, 2018).

Attachment System and Caregiving System. The caregiving system is presumably linked to the robust finding of stepparents being over-represented in child abuse or filicide statistics. This system is associated with psychological mechanisms of solicitude and child-specific love and commitment (D'Alessio & Stolzenberg, 2012; Daly & Wilson, 1996). Stepparents do not possess these mechanisms (or, at least, they are not activated) which function as a buffer against violent responses when children display challenging behaviour. The literature showing step parental abuse/filicide as more violent, cruel and prolonged when compared with genetic parental abuse/filicide supports this hypothesis (Harris et al., 2007; Weekes-Shackelford & Shackelford, 2004). The caregiving system and its associated solicitude likely grows stronger as a child gets older and has a higher reproductive value. This is consistent with findings that age is negatively correlated with abuse or filicide victimisation (Ciani & Fontanesi, 2012; Friedman et al., 2012; Harris et al., 2007). Generally speaking, abuse or filicide perpetrated by genetic mothers or fathers should be considered a failure of the caregiving motivational-emotional system. However, the reviewed articles found contextual cues such as mother's age (young), poverty, lack of social support, and offspring's compromised health (such as being disabled) were risk factors for maternal filicide (Ciani & Fontanesi, 2012). This reflects the idea that motivational-emotional systems will take into account the trade-offs inherent in any ecological context and influence an individual's behaviour based on the most adaptive strategy for *themselves* not others (Kenrick et al., 2010).

Familicide and/or Domestic Homicide-Suicide

Status System. Status likely plays an important role in the commitment of familicide, as familicide perpetrators are predominantly men who have often lost financial or social

status in some manner. For example, a recent systematic review found 31-41% of offenders are unemployed, which may activate the associated emotions of shame, frustration and diminished pride as they feel emasculated by losing their place as the household's 'breadwinner' (Karlsson et al., 2021). In addition, one study in the current review found domestic homicide-suicide perpetrators typically have experienced familial discord and estrangement, reflecting their loss of social status and any proprietary control they had possessed over their family (Starzomski & Nussbaum, 2000).

Mating System and Pair Bonding System. Familicide or domestic homicide-suicide may reflect a failure in the pair bonding system in which signs of relationship termination trigger sexual jealousy and subjective experiences of rejection and hurt so immensely it results in familicide. This ties in with the strong proprietary attitude some men have over their family and the related idea of "If I can't have them, then no-one will" (Johnson, 2006, p.9).

Attachment System and Caregiving System. The killing of one's children reflect failures in the caregiving motivational-emotional system as this system functions to protect and provide for offspring. A possible explanation in the current review is the association between psychopathology and domestic homicide-suicide perpetration (Starzomski & Nussbaum, 2000).

Sibling Violence and/or Siblicide

Reciprocity and Acquisition Systems. Sibling conflict or violence generally occurs over parentally mediated resources and is strongly linked to the acquisition system. Emotions or feelings associated with this system such as desire, greed, envy and anxiety likely facilitate a sensitivity to the amount of parental investment an individual receives relative to their siblings. Sibling violence (and in rare cases siblicide) may reflect a build-up of frustration and resentment one has toward a more 'favoured' sibling.

Conclusion

Although the Fundamental Motives Framework is rudimentary in its current conceptualisation, it holds a number of promising features. Firstly, it provides a multi-faceted perspective of family violence that demonstrates multiple pathways could lead to a single offence based on factors ranging from context, life history, and personal goals/needs. This facilitates an understanding of why people commit certain crimes and provides a clear way of identifying patterns of similarities and differences across offences. Secondly, the role of emotions is recognised as integral to family violence perpetration, highlighting the need for prevention and rehabilitation initiatives to focus on improving individual's emotional intelligence, awareness, and regulation. In addition, the current approach brings psychological mechanisms and their interaction with emotions to the fore of the evolutionary analysis, which provides a solid evolutionary psychological foundation that various articles in the review process lacked. Finally, practical pathways to treatment are identified from this Fundamental Motives approach as practitioners can identify which fundamental motives individuals were failing to meet which triggered their offending, and how they can be met in the future through rehabilitation.

Table 6*Fundamental Motives, Emotions, and Family Violence*

Fundamental Motives (Kenrick et al., 2010)	Key motivational/emotional systems (Mapped on to Ward and Carter, 2019)	Implications for male perpetrated IPV, sexual coercion or homicide	Implications for female perpetrated IPV	Implications for child abuse or filicide	Implications for familicide or domestic homicide-suicide	Implications for sibling violence or siblicide
Immediate physiological needs	Bodily regulation system	Sexually coercive strategies to obtain hormonally driven sexual gratification	Partner violence as a self-defence mechanism to avoid pain	Child sexual abuse relating to obtaining hormonally driven sexual gratification	NA (not applicable)	Hormones salient in youth such as testosterone may indicate sibling violence more likely due to heightened aggression/competitiveness
Self-protection	Fear system Disgust system Security system	Violence as a self-protection mechanism in cases of reciprocal partner violence. Thus, fear will play a role for males (although less so than for females given gender discrepancies in strength, body size etc)	Violence as a self-protection mechanism in abusive relationships, or decreased fear in romantic relationships due to contextual factors making violence less inhibited in women	Stepparents less likely to experience disgust (incest avoidance) cues, thus explaining links to child sexual abuse observed in these populations	Possible link to mental disorders and a deluded belief of killing family to ‘protect’ them from the cruel world which the perpetrator had failed to do so through their loss of employment etc	Given sibling violence is often mutual, it may function as a self-protection mechanism
Affiliation	Affiliation system	A lack of affiliation is associated with	Method to deter partner desertion,	A lack of reciprocity of resources occurs	The break-down of affiliation observed in	Sibling conflict is frequently over parentally

	Reciprocity system	loneliness and rejection, both of which humans are immensely sensitive to. This reinforces the idea of violence as a method to deter partner desertion	similar to male perpetrated IPV	when a child is young as they have little to offer their parents (and stepparents), this potentially could cause tension in relationships	familicides may reflect perpetrators' dramatic reaction to their experience of loneliness and rejection	mediated resources, indicating a sensitivity to what an individual acquires in relation to their siblings
	Acquisition system					
Status/Esteem	Status system	Low gender empowerment associated with men's heightened status and liberty to treat partners violently, competitively disadvantaged males' low status linked with coercive sexual strategies	Low mate value in women (thus low status) associated with controlling behaviour and physical aggression	Asserting parental dominance and superior status may play a role in child abuse/filicide	A loss of status is observed in perpetrators who are often unemployed or have lost social status through the estrangement of their family	Sibling violence is often perpetrated by an older sibling, who may be asserting their status/dominance
Mate acquisition	Mating system	Insecure attachment style, fast life history strategy and lack of self-regulation skills linked to IPV and greater focus on mating effort than parenting effort	Some women have a mate preference for formidable and dominant men, they may therefore need to use violence as a self-defence mechanism if they are attracted to men with aggressive characteristics	Step-parental child sexual abuse toward prepubescent children likely reflects a failure in the mating system, yet arguably this system is functioning normally if the stepchild is post-pubescent	NA	NA

Mate retention	Pair-bonding system	Male proprietary attitude and controlling/coercive/violent behaviour to retain pair-bonded mate and decrease paternity uncertainty	Violence functioning to retain a mate and ensure they are not unfaithful or diverting their resources to other women	NA	The failure of retaining one's mate (and family) is a common characteristic of familicide perpetrators. This may be linked to a proprietary attitude over one's family, with sexual jealousy and rejection also influencing the decision to commit this offence	NA
Parenting	Attachment system Caregiving system	Insecure or anxious romantic attachment style associated with partner violence	Anxious attachment style linked to psychological aggression, sexual coercion, and physical assault	Stepparents lack solicitude and child-specific love and commitment, thus more prone to stepchild abuse or filicide, failures in these systems in cases of genetic parent abuse/filicide	Killing one's child is a failure of these systems and is possibly linked to psychopathology which is often observed in these populations	A potential sensitivity between siblings as to who has a stronger attachment with their parents and is thus 'favoured' and given more resources. This likely leads to hostility and violence from less favoured siblings toward favoured siblings
Other motivational systems	Aggression system	Domain-specific forms of aggression such as mate retention to reduce partner infidelity or desertion	Female aggression less inhibited within romantic relationships due to greater release of oxytocin or living in a society of high gender empowerment	Step-parental aggression less inhibited due to lack of (or less) parental solicitude and child-specific love and commitment	Aggressive reaction to being estranged from one's family	Aggression as a technique to obtain more parentally mediated resources

Chapter Seven: Discussion

Summary and Key Findings

The current thesis had two aims: (1) Conduct a systematic review examining and describing different evolutionary-based conceptualisations of family violence developed over the last four decades. (2) Develop a novel theoretical framework that conceptualises family violence from an evolutionary perspective in a potentially more clear and coherent manner.

With regards to the first aim, it became evident in the review process that current literature on evolutionary-based conceptualisations of family violence is varied, complex and conceptually messy. In total, 54 publications were included in the review and ranged from original theoretical pieces through to empirical studies and editorial commentaries. Collectively, they covered relatively minor offences such as interpersonal conflict through to extreme offending such as homicide, and were partner-, child- and sibling-directed. The authors' explanatory targets were conceptualised as either an adaptation, by-product or pathological. However, the reviewer(s) had to make inferences about the proposed evolutionary conceptualisation for some publications as not all authors explicitly stated which conceptualisation most suited the phenomena they described. This was particularly characteristic of the experimental studies, which may be attributed to empirical researchers' objectives being more focused on testing hypotheses rather than exploring the evolutionary theory behind such predictions. To make matters more ambiguous, some explanatory targets were described as adaptations by some authors, yet by-products or pathological by others.

To make sense of this complex array of literature, the findings were synthesised into six recurrent themes: lack of resources, genetic relatedness as a protective factor, fast life history strategy, reproductive value, lethal violence as pathology, and male sexual and familial proprietariness. Each will be summarised and compared to relevant literature below.

A Lack of Resources

A lack of resources was identified in the review as empirically associated with stepchild abuse in disadvantaged communities (D'Alessio & Stolzenberg, 2010), neonaticide by poor single mothers (Ciani & Fontanesi, 2012), and sibling conflict (Salmon & Hehman, 2014). The theoretical articles predicted such behaviour as likely a facultative adaptation to ecological instability (Friedman et al., 2012; Levesque, 2001). These findings are consistent with evidence of unemployment as a risk factor for perpetration of partner violence (Capaldi et al., 2012; Durrant, 2018), child abuse (Rittner, 2002) and neonaticide (Durrant, 2018). Furthermore, social risk factors for child abuse included living in disadvantaged/impooverished communities (Archer, 2012; Black et al., 2001) and social isolation (DePanfilis & Zuravin, 1999) which support current findings. Finally, findings are in-line with the global association between social disadvantage and criminal offending (Durrant & Ward, 2015; Farrington & Welsh, 2008). From an evolutionary perspective, this is predicted to relate to individuals adopting a fast life history strategy as an adaptive calibration to their experiences of environmental unpredictability and/or harshness (Del Giudice et al., 2011; Durrant & Ward, 2015).

Genetic Relatedness as a Protective Factor

Genetic relatedness as a protective factor was supported by empirical studies in the review that found stepchildren were at greater risk for abuse (D'Alessio & Stolzenberg, 2010) and filicide (Daly & Wilson, 1994) than genetic children. This prediction was only partially supported with regards to sibling conflict as Salmon and Hehman (2015) found conflict was greatest with nonbiological siblings, least with half-siblings, and a medium intensity with full siblings. The theoretical literature and commentaries similarly identified this theme and suggested the psychological mechanisms at play include a lack of 'child-specific parental love' (Daly & Wilson, 1998) and parental solicitude (Daly, 1989; Daly & Wilson, 1996; Platek & Shackelford, 2006; Schlomer et al., 2011) present in stepparents,

which serve to inhibit child-directed harm. These findings are consistent with general family violence literature that indicate risk factors for child abuse perpetration include living with non-genetic kin (Archer, 2012). In addition, the research is consistent with Hamilton's (1964) theory of kin as more likely than unrelated individuals to cooperate and behave altruistically toward each other as it enhances their *own* inclusive fitness (Archer, 2012).

Fast Life History Strategy

The theme of a fast life history strategy influencing family violence rates was repeatedly observed in the review. Experimental studies found early childhood experiences of environmental unpredictability and harshness was associated with an anxious or insecure attachment style in romantic relationships and subsequent IPV perpetration and victimisation (Barbaro & Shackelford, 2016; Szepeswol et al., 2019). Several authors similarly found IPV was predicted by a fast life history strategy and likely related to the relevant population's compromised executive functioning skills (Buunk & Massar, 2019; Figueredo et al., 2018). Theoretical articles from the review are consistent with these findings and conceptualise a fast life history strategy as a facultative adaptation responding to cues of extrinsic mortality or environmental unpredictability (Figueredo et al., 2012a; Levesque, 2001). On a similar vein, the general family violence literature found attachment issues were a risk factor for female perpetrated IPV, while experiencing or witnessing child abuse oneself was associated with subsequent perpetration of IPV (Capaldi et al., 2012) and sibling violence (Button & Gealt, 2010; Hoffman & Edwards, 2004).

Reproductive Value

Reproductive value was a theme linked to IPV and child abuse or filicide victimisation. Several empirical studies found male perpetrated IPV was associated with men's lower mate value (Buunk & Massar, 2019; Figueredo & McCloskey, 1993), indicating a sensitivity to the higher reproductive value of their partner and thus heightened mate-

guarding behaviour. In addition, Peters et al. (2002) found younger women were at greater risk for IPV than older women, even when confounding variables such as partner's age were controlled for. The theoretical literature did not specify whether this pattern is an adaptation or by-product, but presumably relates to the psychological mechanism of sexual jealousy (Buss & Duntley, 2014). With regards to filicide, one experimental study suggested neonaticide was an adaptive disinvestment strategy (Ciani & Fontanesi, 2012), while a theoretical paper similarly conceptualised filicide as a facultative adaptation in disadvantageous conditions (Friedman et al., 2012). These findings echo family violence literature that indicate risk factors for child abuse include age (the younger, the higher the risk; Archer, 2012) and having a disability (Stalker & McArthur, 2012).

Lethal Violence as Pathology

Lethal violence as pathology was a divisive hypothesis, with several experimental studies indicating filicide was associated with psychiatric symptoms (West & Friedman, 2007), while others found pathology to be context-dependent with neonaticide linked to no maternal psychopathology but present in mothers who killed older children (Ciani & Fontanesi, 2012; Harris et al., 2007). Familicide was conceptualised as a dysfunctionally extreme by-product by Wilson et al. (1995), yet Starzomski and Nussbaum (2000) claimed domestic homicide-suicide reflects pathology due to perpetrators often displaying psychological disturbances such as depression, severe stress, and schizophrenia. General family violence literature is indicative of pathology playing a clear role in lethal violence, with risk factors for child abuse perpetration including emotional behavioural problems/dysphoria (Durrant, 2018; Hindley et al., 2006), and female perpetrated IPV associated with borderline personality traits (Mackay et al., 2018).

Male Sexual and Familial Proprietariness

The majority of partner violence literature was linked to male sexual proprietariness, while familicide was associated with familial proprietariness. The empirical literature found links between male sexual jealousy and uxoricide (Daly et al., 1982; Deacy & McHardy, 2013), however one study found possessive jealousy did not predict male perpetrated IPV (Buunk & Massar, 2019). The theoretical literature conceptualised male perpetrated IPV as an adaption (Daly, 2016; Kaighobadi et al., 2009; Wilson, 1989; Wilson & Daly, 1998), or by-product (Belsky, 2016) functioning to reduce partner infidelity or desertion and solve the adaptive problem of paternity uncertainty and risk of cuckoldry. Broader family violence and evolutionary literature support these claims (Capaldi et al., 2012; Glass et al., 2003; Goetz & Romero, 2011). Finally, familicide and domestic-homicide suicide literature was linked to familial discord and estrangement (Starzomski & Nussbaum, 2000), and perpetrators were predominately men who shared more similar characteristics with uxoricide than filicide perpetrators (Wilson et al., 1995). Familicide was thus predicted to reflect a male familial proprietary attitude (Wilson, 1989).

The Fundamental Motives Framework

In addition to the systematic review, the Fundamental Motives Framework was developed as a preliminary exploration of an alternative approach to conceptualising family violence. The framework drew heavily from evolutionary literature on motivation and emotion (Aunger & Curtis, 2013, 2015; Del Giudice, 2018; Kenrick et al., 2010; Schaller et al., 2017; Ward & Carter, 2019). The idea of the Fundamental Motives Framework was to map findings from the systematic review onto 11 motivational-emotional systems developed by Ward and Carer (2019) and altered slightly in-line with Del Giudice's (2018) motivational systems and evolutionary literature on emotion (Kenrick et al., 2010). A summary of the theory development and appraisal process is briefly touched on below.

Theory Development and Appraisal

The process of theory development followed the recommendations of Ward (2014). First of all, it is recommended to describe the targets of explanation prior to formulating and presenting theories. The current Fundamental Motives Framework identified early on the explanatory targets of interest as specific types of family violence offences. In addition, it is recommended to capitalise on existing theory, thus drawing from valuable research already provided by influential researchers from relevant fields (Ward, 2014). The current framework is based on a variety of pre-existing motivational-emotional literature, and the intention of the theory was to develop an adapted version of previous theories that is unique to family violence. A third important component is integrative pluralism as a multi-level theory-building strategy. This process involves incorporating divergent levels of analysis to help account for the heterogeneity of offending and the different types of causal factors (Ward, 2014). The present approach incorporated evolutionary (motivational-emotional systems as psychological adaptations) developmental (age, environmental harshness, attachment style, life history strategy), sociocultural (gender equality estimates, poverty) and psychological (e.g., mental disorders) factors to help explain and predict family violence in light of different levels of human functioning. Another recommended approach is to shift the focus of theory development from construct validity (defining an offence by relating observations to other observations) to underlying causal mechanisms. The focus on underlying causal mechanisms is inherent to the Fundamental Motives Framework as its primary aim was to identify distal evolutionary-based psychological mechanisms referred to as motivational-emotional systems that play a role in explaining family violence across the globe. Finally, a first-person perspective is considered worthy of research (focusing on a person's experiences, values and beliefs). This was partially used in the current theory development, particularly with regards to the role of life experiences such as social disadvantage and environmental harshness on subsequent offending behaviour.

With regards to theory appraisal, the Fundamental Motives Framework sought to identify a variety of underlying motivational-emotional systems that reflect goals/needs that all humans possess and influence behaviour (offending or non-offending). This has strong explanatory depth as it indicates the underlying mechanisms and processes at play can be applied across a variety of contexts and does not solely pertain to family violence. In addition, there is clear unifying power of the current theory as it draws on research from motivational and emotional literature while incorporating evolutionary, developmental, sociocultural and psychological perspectives. Finally, there is fertility (or heuristic value) in that the Fundamental Motives Framework can lead to a number of new predictions or avenues of inquiry. For example, in a clinical setting, new interventions could use the theory's predictions that indicate motivation plays a large role in behavioural output and focus on helping individuals identify which motivational system is most salient in their life and how to manage associated feeling states such as jealousy that is activated and directed towards their loved ones.

Strengths and Limitations

Strengths

Although previous reviews of family violence literature from an evolutionary perspective have been conducted (see Archer, 2012), the current thesis is the first systematic review on this topic and includes novel theoretical development in light of the review's findings. This systematic approach reflects a more thorough, transparent and rigorous process that identified relevant literature in an un-biased manner. In addition, although the primary reviewer's initial lack of familiarity with the evolutionary-based content is in some sense a limitation, this arguably facilitated the objectivity required of a systematic review as they analysed the data with no preconceived biases or preferences regarding what to draw from the findings.

Limitations

A limitation of this thesis was the time restriction on completing the thesis meant the initial intention to review all evolutionary-based conceptualisations of crime had to be narrowed down to family violence literature only. Although this reflects the exploratory nature of the review, this decreased the author's ability to make far-reaching and broad conclusions about the findings as it applies to crime in general. In addition, although a clear methodology was developed to identify relevant articles, the current search strategy was likely to have inevitably missed some relevant articles in which evolutionary approaches were used to understand family violence. This may have been especially the case for empirical articles in which hypotheses were influenced by evolutionary thinking but where this was made less explicit. This means that although the 'universe' of all potentially relevant articles may not have been captured, a large enough sample was identified to draw broad conclusions about evolutionary literature on family violence. Another limitation was the lack of research identified on child-to-parent violence or elder abuse. These are important explanatory targets to examine given their relatively high prevalence rates (Cooper et al., 2008; Moulds et al., 2016) and the increasing rate of aging populations world-wide (Kanasi et al., 2016).

Implications and Recommendations for Practice and Policy

The findings from the review and Fundamental Motives Framework imply that family violence is behaviour that functions to solve recurrent adaptive problems and is associated with relevant motivational-emotional systems that facilitate this process. This explains the ubiquity of family violence world-wide and suggests in order for prevention and intervention to effectively work it needs to address the variety of underlying needs/goals individuals are trying to meet through harmful behaviour. This provides a clear pathway for treatment intervention as it suggests clinicians should recognise the heterogeneity of offending and seek

to identify which specific motivational-emotional systems are relevant to their client's behaviour and can be addressed through treatment. For example, say an individual has an insecure or anxious attachment style and is abusing their partner, this is likely linked to the attachment motivational-emotional system. Thus, treatment could involve training in emotion regulation and interpersonal functioning techniques coupled with treatment (if relevant) of commonly co-occurring disorders such as anxiety or obsessive compulsive disorder (Mikulincer & Shaver, 2012). The strength of this approach is that it seeks to treat the underlying causal *mechanisms* at hand not the surface level *behaviour*. This is likely to be more effective as numerous people can display the same dysfunctional behaviour for a variety of different reasons. Therefore, behaviour sheds little insight onto what their individual treatment needs are. These suggestions are consistent with the Good Lives Model, which is a strength-based approach that aims to support individuals to attain primary human goods in socially acceptable and personally meaningful ways (Ward & Brown, 2004).

Another important practice implication is the use of emotion-focused therapies with offending populations given its integral nature to the motivational-emotional systems. In terms of policy implications, there is a need for government and community initiatives that address relevant risk factors observed in the literature. For example, financial empowerment and social support should be provided to young single mothers (Ciani & Fontanesi, 2012; Hillis et al., 2016).

Future Research

Future evolutionary-based research should address the gaps in the literature on family violence such as child-to-parent violence, elder abuse, sibling violence, and female perpetrated IPV. To gain a better understanding of female perpetrated IPV, future research will need to incorporate more non-Western samples to help determine the role of gender equality on partner violence. In addition, no literature was identified on LGBTQIA+

relationships which could provide an interesting avenue to compare and contrast with the well-documented literature on cisgender heterosexual couples. Finally, future research on motivational-emotional systems from various different levels of analysis neglected in the current review such as neuroscience would provide insight and depth to the Fundamental Motives Framework.

Conclusion

The current thesis systematically reviewed evolutionary-based conceptualisations of family violence and provided a novel approach to framing this literature. It is clear from the review process that evolutionary psychology holds a number a number of powerful and empirically supported explanations of family violence. However, there is currently no overarching framework that researchers use to conceptualise their findings in a clear and standardised manner. The Fundamental Motives Framework tentatively addresses this gap in the literature by providing an accessible, simple framework based on evolved motivational-emotional systems. This preliminary framework is useful in that it can flexibly account for the heterogeneity observed in offending due to its recognition of multiple and varied motivational-emotional systems at play in any given offence. In addition, theory is only as useful as its ability to be understood and incorporated by researchers from a wide range of fields. The terminology used in a motivational-emotional systems approach is better than current evolutionary-based descriptions at connecting to mainstream psychological literature on motivation/emotion. This will likely lead to a better integration of distal and proximate explanations of offending. To conclude, family violence is an insidious and highly prevalent form of abuse. It is the hope of current research to identify ways in which distal explanations and theoretical formulations can assist in mitigating this public health concern.

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