A Compositional Explanatory Theory of Pedophilia

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Abstract

A key problem associated with adequate knowledge generation in pedophilia is that theories and studies predominantly examine *abusive* pedophilia. Acting abusively in relation to children—even where pedophilia is present—is likely to involve a different set of processes to those involved in the underlying concept of pedophilia itself. What is required is a consistent definition of pedophilia, as well as an explanation of its composition, to promote insight into the etiological mechanisms underpinning pedophilia independent of abusive behavior. In this manuscript, I critically review both the concept of pedophilia and existing pedophilia theory. Then, using the Phenomena Detection Method of Theory Construction (PDM-TC; Ward & Clack, 2019), I generate a compositional explanatory theory of pedophilia (CEToP). The CEToP examines the composition and possible causes of pedophilia via an overarching framework that specifies two key pathways as being responsible for the central clinical features of pedophilia and reconciles biological and environmental explanations of pedophilia. I examine this new theory according to key evaluative components associated with theory construction and conclude by highlighting the CEToP's potential application for research and practice with individuals experiencing pedophilia.

A Compositional Explanatory Theory of Pedophilia

A substantial body of research has accumulated on the topic of pedophilia (see Seto, 2018). Yet despite widespread usage of the term pedophilia in research and theory, there is little description or explanation of the key phenomena that constitute pedophilia (i.e., its composition). A key problem associated with adequate knowledge generation in this area is that theories and studies predominantly examine *abusive* pedophilia (i.e., individuals who have engaged in contact or non-contact crimes against children). Acting abusively in relation to children—even where pedophilia is present—is likely to involve a different set of processes to those involved in the underlying concept of pedophilia itself. Explaining the construct of pedophilia itself is important since this construct represents a key risk factor implicated in child sexual abuse (Seto, 2017b; Smid & Wever, 2019). Thus, what is required is a consistent definition of pedophilia, as well as an explanation of its composition, to promote insight into the etiological mechanisms underpinning pedophilia independent of abusive behavior. In this article, I will examine the composition and etiology of pedophilia through developing a theory that focuses specifically on pedophilia itself as a construct. First, I will introduce current issues underlying the concept of pedophilia. Then I will provide an overview of existing pedophilia theory before proposing and appraising the Compositional Explanatory Theory of Pedophilia (CEToP).

What are the Problems with the Concept of Pedophilia?

At present, professional understanding of what constitutes or causes pedophilia is impoverished. In fact, we have not yet reached any definitional concensus regarding pedophilia.

Current Classificatory Approaches

For almost seven decades, pedophilia has been classified as a *mental disorder* by the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*. Within this manual, pedophilia has been classified under various DSM sections (e.g., Psychosexual Disorders, Paraphilic Disorders) using numerous definitions (Malón, 2012).

The DSM provides some comments regarding the constitution and etiology of pedophilia based upon expert literature reviews. The DSM-5 (APA, 2013[1]), for example, describes the risk factors for pedophilia as being temperamental, environmental, and genetic/physiological. It outlines the diagnostic criteria for pedophilia disorder as being dependent upon (1) enduring experiences (i.e., > 6 months) of sexual fantasies/urges/behaviors regarding prepubescent children or a child; and (2) acting upon, or being affected by these experiences negatively (i.e., distress/interpersonal difficulties). However, there is another group of people who have a sexual attraction towards a prepubescent child or children and who do not experience this negatively and/or act on these interests (see Cranney, 2017; Nielsen, Aaskov, & Larsen, 2020). Such individuals are only just being noted in the literature and have not always been classified as pedophilic.

DSM-5 states that for a diagnosis of pedophilic disorder, individuals must be 16 years or over and five or more years older than the prepubescent object of their sexual fantasies/urges/behaviors. It notes that while some of these individuals have little to no sexual attraction to adults (i.e., exclusive pedophilia) others have coexistent sexual attraction to adults (i.e., non-exclusive pedophilia). While variations in pedophilia exclusivity (see McPhail, Olver, Brouillette-Alarie, & Looman, 2018),

[1] The World Health Organisation's 2022 ICD-11-CM Diagnosis of Pedophilia is similar.

are widely noted, no information is provided by DSM-5 as to why someone might develop exclusive versus non-exclusive pedophilia.

Over the years, professionals have voiced dissatisfaction with DSM's classification of pedophilia due to lack of diagnostic specificity (Beech, Miner, & Thornton, 2016; Berlin, 2014). For example, it is unclear why 'acting upon' pedophilia—which is likely to involve a different set of processes to those involved in the disorder itself—forms part of defining pedophilia. Interestingly, DSM-5 originally labelled individuals who abstained from acting on their pedophilia as holding a *sexual orientation*—rather than a disorder—but then replaced this term with *sexual interest* due to public concern that pedophilia was being legitimized (Liberty Counsel, 2013). These differing labels add further conceptual confusion regarding the construct of pedophilia since the terms sexual interest and sexual orientation are likely to describe differing concepts. For example, sexual interest has been used by professionals to simply refer to the types of person or activities an individual is interested in sexually (Moser, 2016). Sexual orientation or preference, on the other hand, has been used to refer to a more powerful form of sexual interest that appears pervasive and longstanding (see Moser, 2016; Schmidt & Imhoff, in press; Seto, 2012).

Seto (2017a; 2018) attempted to provide further clarification around the construct of pedophilia through viewing it as a form of chronophilia (Money, 1986); that is, an age-specific sexual orientation or preference that deviates from a focus on reproductive adults (Seto, 2017a). Conceptualized in this way, pedophilia is hypothesized to have etiological similarities to other chronophilias such as nepiophilia, hebephilia, and ephebophilia (i.e., attractions to infants/toddlers, pubescent, or post pubescent children respectively; Seto, 2018). Certainly, these chronophilias are often included in research and theory alongside pedophilia (Seto,

2017a; Smid & Wever, 2019). However, while there may be etiological similarities, there may also be differing symptom patterns and etiological pathways; especially between pedophilia and chronophilias that involve notable signs of sexual maturity.

As noted earlier, there has been a tendency for professionals to conflate pedophilia with the concept of child sexual *abuse*. There are two key areas of classificatory issue here. The first relates to the general mislabeling of *any* sexually abusive behavior towards children (e.g., peri or post pubertal) as stemming from pedophilia (Gudjonsson, 1990; Ivey & Simpson, 1998; Regestein & Reich, 1978). Research shows that individuals engage in sexually abusive behavior with children for myriad reasons; many of which *exclude* pedophilia (e.g., situational factors; Smallbone & Cale, 2016 or intimacy deficits; Ward & Siegert, 2002). The second relates to reservation of the term pedophilia specifically for those who illegally act on their pedophilic sexual interest (e.g., through viewing indecent images of children or touching a child sexually). Evidence is accumulating to suggest that a proportion of pedophilic individuals control their sexual urges regarding children; choosing to remain abuse abstinent (i.e., Beier et al. 2009; Cantor & McPhail, 2016; Jahnke, 2018; Schaefer et al. 2010). Consequently, pedophilia is best viewed as a set of coexisting clinical phenomena that is conceptually distinct from abusive action.

Our lack of professional understanding of pedophilia may stem from low rates of pedophilia prevalence making research with this population difficult. While pedophilia prevalence estimates average around 50% for men who sexually abuse children (Seto, 2018), they are believed to be around 1% for the general male community (Seto, 2018; see Santtila et al., 2015; Seto et al., 2010) and have not yet been calculated for women. In fact, research on female pedophilia is almost non-existent (Chow & Choy, 2002; Saradjian, 1996).

Current Explanations of Pedophilia

Numerous theoretical accounts of pedophilia have emerged over the past few decades. By far the most common are single factor theories (Ward & Hudson, 1998) which examine the role of a sole factor and explain its causal relationship with the concept of pedophilia itself and/or abusive action. These theories can generally be divided into two *subtypes*: those emphasizing the predetermined and/or unchangeable nature of pedophilia, and those emphasizing the environmental and more flexible nature of pedophilia.

Single Factor Explanations: Pedophilia is Biologically Based or Predetermined

Quinsey & Lalumière's (1995) Evolutionary Account of Pedophilia

Quinsey and Lalumière's (1995) account of pedophilia (see also Quinsey, 2002; 2003) rests on the assumption that adult males possess a series of evolutionarily determined independent sexual preference brain "modules" that have been selected to detect gender, youthful vigor, and physical build (i.e., sexual maturity indicators such as waist-hip ratio; Quinsey, Rice, Harris, & Reid, 1993). In some cases, however, these module detectors are hypothesized to independently fail. In the case of pedophilia, for example, when the physical build or sexual maturity detector fails, prepubescent children become attractive because the adult male sexually prefers the characteristics of youth (e.g., smooth flawless skin) in the absence of a module signaling sexual maturity. That is, there is a disconnection between the modules designed to detect youth *and* sexual maturity. Quinsey and Lalumière's propositions seem to explain the relatively high levels of same sex or mixed sex victim choices of men with abusive pedophilia relative to non-offending men who pursue sexually mature partners (Bailey, Bernhard, & Hsu, 2016; Quinsey, 2003; Quinsey & Lalumière, 1995; Seto, 2012). This is because, when an individual becomes blind to

sexual maturity, gender becomes less salient (Seto, 2012). This account of pedophilia is useful since it focuses on the mechanisms that cause the clinical phenomenon of pedophilia rather than pedophilic abuse. It also explains the rarity of female pedophilia since the evolutionary mechanisms involved shaped *male* rather than female sexual preferences. However, Quinsey and Lalumière's explanation assumes that pedophilia reflects a fixed and unchangeable sexual orientation.

The Genetic Account of Pedophilia

This approach assumes that pedophilia development is, to some degree, influenced by genetics and that pedophilia may be associated with candidate genes. A number of researchers have implicated genetics in the development of pedophilia (Alanko, Salo, Mokros, & Santtila, 2013; Gaffney, Lurie, & Berlin, 1984). Unfortunately, one of the largest studies suggestive of genetic influences (N = 21,566) focused on sexual offending towards children more generally and did not record pedophilia status (see Långström, Babchischin, Fazel, Lichtenstein, & Frisell, 2015). Gaffney et al. (1984), however, found that pedophilia diagnoses, specifically, were more frequent in families of individuals with pedophilia relative to those exhibiting other paraphilias (15% vs. 5%); although they did not control for upbringing. Nevertheless, behavioral genetics modelling using male siblings (including monozygotic and dizygotic twins) supports the view that pedophilia is, in part, genetically determined (Alanko et al., 2013). Two male pedophilia studies have searched for candidate genes (Alanko, Gunst, Mokros, & Santtila, 2016; Jakubczyk et al., 2017). Alanko et al. examined 54 single nucleotide polymorphisms (SNPs) for non-abusive pedophilia and Jakubczyk et al. (2017) examined SNPs and variable number tandem repeats (VNTRs) associated with the 5-HT and DA neurotransmitters

for abusive pedophilia. However, neither study found conclusive evidence[2]. One reason for this could be the role of epigenetics which refers to the process of long-term biological DNA modification (in the absence of DNA sequence alterations) as a result of environmental effects (Goldman, 2012; Ho et al., 2012; Jirtle & Skinner, 2007). These chemical modifications (e.g., methylation) determine whether particular genes are activated or not and are implicated in growth and neurodevelopment (Goldman, 2012; Meng, Zhou, Feng, Xu, Tang, & Wu, 2019). Alternatively, candidate genes may not be associated with pedophilia.

Centre for Addiction and Mental Health's Neurodevelopmental Account of Pedophilia

Research conducted primarily by researchers from the Centre for Addiction and Mental Health (CAMH) in Canada has suggested a link between male pedophilia and neurodevelopmental issues. This research, examining predominantly abusive pedophilia, highlights an overrepresentation of non-right handedness (Blanchard et al., 2007; Cantor et al., 2004; 2005), Minor Physical Anomalies (i.e., subtle congenital deformities such as curved fingers; Dyshniku, Murray, Fazio, Lykins, & Cantor, 2015), and short stature in pedophilic relative to non-pedophilic controls (Cantor et al., 2005; Dyshniku et al., 2015; McPhail & Cantor, 2015). Handedness and MPAs, in particular, form early in the gestation period (Aksoy-Poyraz, Poyraz, Turan, & Arikan, 2011; Fazio, Lykins, & Cantor, 2014) and have been linked to the development of conditions such as schizophrenia and autism (Ozgen, Hop, Hox, Beemer, & van Engeland, 2010; Weinberg, Jenkins, Marazita, & Maher, 2007). Postnatally, Blanchard and colleagues (2003) have also noted that phallometrically

[2] Alanko et al.'s study initially appeared to have uncovered evidence for candidate gene involvement in pedophilia (e.g., on androgen, estrogen, prolactin, and oxytocin SNPs). However, these effects disappeared following statistical adjustment.

defined pedophiles (who had abused others or exhibited "disturbing sexual behavior") self-reported more serious head injuries before the age of 6 years relative to non-pedophilic sexual assessment controls (see also Blanchard et al., 2002). Serious head injury was also related to lower levels of education and IQ. On the basis of these findings, Blanchard et al. propose two key etiological pedophilia pathways. First, head injury may lead to a neuropsychological issue directly related to the development of pedophilia. The lower IQ scores may well indicate that cognitive functioning has been impacted. Second, head injury may be the *result* of accident proneness caused by a pre-existing—and perhaps prenatal—neurodevelopmental issue that, by itself, is directly related to pedophilia.

Studies examining structural brain patterns in abusive pedophiles indicate reduced volume in the right amygdala relative to offending and non-offending controls (Schiltz et al., 2007; Poeppl et al., 2013) as well as reduced white matter (Cantor et al., 2008; Cantor et al., 2015). Such observations could indicate sexual signal processing problems (Cantor et al., 2008; Mohnke et al., 2014; Seto, 2018; Stoléru et al., 1999) linked to neurodevelopmental issues, although white matter reduction might explain pedophilic *behavior* rather than pedophilia itself (see Lett et al., 2018) or may not be etiologically related to pedophilia at all (see Ward, Wilshire, & Jackson, 2018 or Joyal et al.'s, 2019 critiques).

Late Onset Neurological Impairment Accounts of Pedophilia

Numerous case studies have described acquired abusive pedophilia associated with late onset neurological impairment stemming from brain injury (e.g., stroke, tumor, dementia; Burns & Swerdlow, 2003; Fumagalli, Pravettoni, & Priori, 2015; Mendez & Shapira, 2011; Scarpazza et al., 2018; Regestein & Reich, 1978; Sartori et al., 2016). Many of these cases locate frontal lobe involvement which is a complex

part of the brain associated with consequential cognition, regulatory behavior (Stuss & Knight, 2013), and libido (Kuhn, Greiner, & Arseneau, 1998). A key problem with these case studies, however, is that the acquired damage is likely to be widespread and varied. Such case studies are also unable to explain exactly how acquired neurological damage facilitates pedophilia itself rather than pedophilic abuse. Individuals experiencing acquired pedophilia appear to come to the attention of researchers once they have acted on their pedophilia illegally. This is problematic for understanding the construct of pedophilia since such behavior may reflect (1) an individual's reduced ability to manage pre-existing pedophilia, or (2) an altered sexual drive or acquired preference (see Miller, Cummings, McIntyre, Ebers, & Grodes, 1986) making prepubescent children highly sexually desirable and arousing in the presence or absence of injury-related regulatory functional impairment.

Single Factor Explanations: Pedophilia is Learnt

Laws and Marshall's Conditioning Theory (1990)

Laws and Marshall (1990) proposed that classical and operant conditioning principles are key for explaining both the development and maintenance of pedophilia (see also McGuire, Carlisle, & Young, 1964). For example, Laws and Marshall (1990) argued that sexual arousal can become a classically conditioned response if physiological sexual arousal is temporally paired with particular stimuli. They draw upon Seligman's (1970) concept of preparedness in hypothesizing that some stimuli—such as prepubescent children—are reasonably likely to become sexually conditioned due to evolutionary influences since prepubescent children are only a step away from becoming suitable reproductive partners (see Quinsey & Lalumière, 1995). Since more males admit sexual fantasies or thoughts about a prepubescent child relative to females (Joyal, Cossette, & Lapierre, 2015), men may be more biologically

'prepared' to develop pedophilia. Laws and Marshall conceptualize pedophilia as becoming difficult to change when pedophilia-supportive conditioning is maintained in some way (e.g., via intermittent reinforcement). However, they also assume that pedophilia can be manipulated to some extent (see Foote & Laws, 1981; Josiassen, Fantuzzo, & Rosen, 1980). Recent meta-analytic research has indicated that conditioning techniques are successful in reducing pedohebephilic arousal (McPhail & Olver, 2020). Meta-analytic research has also indicated improved outcomes for sexual offence programs that attempted to recondition inappropriate sexual foci (Gannon, Olver, Mallion, & James, 2019). Nevertheless, these findings do not indicate whether pedophilia itself has been modified or simply better managed (see Marshall, 2020; McPhail & Olver, 2020).

Social Learning Theory

In Laws and Marshall's (1990) conditioning theory described above, the initial catalysts for conditioning pedophilia are hypothesized to stem from social learning influences (i.e., social behavior and experiences such as sexualised child play, abuse, or exposure to pornography/inappropriate discussions; McGuire et al., 1964). Three social learning processes (Bandura, 1973, 1977) are cited as being key: *direct modelling* (i.e., copying the behavior of a model that is directly experienced), *vicarious learning* (i.e., learning indirectly through observing or hearing about pedophilia), and symbolic learning (i.e., learning through imagining sexual encounters with prepubescent children). Direct modelling—commonly referred to as the *victim to abuser hypothesis*—has received the most empirical support (Freund & Kuban, 1994; Greenberg, Bradford, & Curry, 1993; Lee, Jackson, Pattison, & Ward, 2002; Levenson & Grady, 2016; Nunes, Hermann, Malcom, & Lavoie, 2013). For example, Nunes et al. (2013) studied a database of 462 men who had sexually offended. They

found that men who had experienced childhood sexual abuse—self reported or officially documented—showed more pedophilic tendencies on an adapted version of the SSPI (*Screening Scale for Pedophilic Interests*; Seto & Lalumière, 2001) and had younger victims relative to men without sexual abuse experience. Levenson and Grady (2016) asked 700 (mostly male) sexually abusive individuals to self-report previous childhood mistreatment using the ACE (*Adverse Childhood Experiences Scale*; Centers for Disease Control and Prevention, 2013). Childhood sexual abuse emerged as a key predictor of a "sexual deviance" construct comprised of variables likely to indicate pedophilia (i.e., offending involving male or stranger victims, victims < 12 years, or multiple victims). Social learning approaches assume that pedophilia becomes internalized and abusive. However, unless the theory is paired with conditioning theory (see Laws & Marshall, 1990) the exact mechanisms underlying the development of pedophilia remain unclear (Smid & Wever, 2019). In fact, professionals have very little understanding of why childhood sexual abuse is linked to pedophilia and childhood sexual abuse is linked to numerous conditions and criminal behaviors (e.g., psychosis, Bourgeois, Lecomte, & Daigneault, 2018; violence; Voith, Anderson, & Cahill, 2020).

Multifactorial Explanations of Pedophilia

To date, single factor explanations of pedophilia have not been drawn together comprehensively to explain the construct of pedophilia. Professionals have encapsulated the concept of pedophilia—to varying degrees—within broader theories of sexual abuse. Several multifactorial theories have been proposed and all have attempted to explain under one theoretical framework either the sexual abuse of adults and children (Marshall & Barbaree, 1990; Seto, 2008; 2017b; 2018; Smid & Wever 2019; Stinson, Sales, & Becker, 2008; Stinson & Becker, 2013; Ward & Beech, 2006)

or the sexual abuse of children more generally (Finkelhor, 1984; Finkelhor & Araji, 1986; Finkelhor, Cuevas, & Drawbridge, 2017; Hall & Hirschman, 1992; Ward & Siegert, 2002). As noted earlier, sexual abuse is associated with extremely heterogenous clinical presentations many of which do not involve pedophilia. Current multifactorial explanations have not always mentioned pedophilia explicitly and when they have done they have paid little attention to elucidating this construct. Accounting for pedophilia is critical since it is more likely to be a coherent construct relative to sexual abuse more generally. The two theories that mention pedophilia more specifically are Seto's 2008; 2017b; 2018 Motivation-Facilitation Model and Smid and Wever's (2019) Incentive Motivational Model.

Seto's Motivation-Facilitation Model (2008; 2017b; 2018)

The Motivation-Facilitation Model of Sexual Offending (MFM) attempts to account for the abuse of both children and adults within one overall framework and yet—in a departure from previous theories—places significant emphasis on the construct of pedophilia. Within the MFM, sexual offences are viewed as being the product of an underlying motivation (i.e., paraphilias, high sex drive, strong mating effort), state and trait facilitation, and relevant situational factors. In the latest MFM, pedophilia is conceptualized as being a key paraphilic *motivator*. Here, neurodevelopmental issues associated with the CAMH account of pedophilia are hypothesized to underpin a general inability to detect youthfulness appropriately; resulting in pedophilia. Good state and trait inhibitory control (i.e., being sober, strong self-regulation) is predicted to promote offence abstinence and an opportunity to offend must be present for abuse to occur. The MFM incorporates pedophilia as a causative factor that, when accompanied by other factors may or may not result in abusive behavior rather than a

clinical construct to be explained in and of itself. Thus, the MFM is limited in its ability to fully account for the construct of pedophilia and its development.

Smid and Wever's Incentive Motivational Model of Sexual Deviance (2019)

This theoretical approach describes a wide variety of sexual offending behaviors paying particular attention to the sexual motivators (i.e., interests and preferences) that drive them. What makes this model unique, however, is the attention paid to flexibility and learning in the process of pedophilia development. Sexually inappropriate behavior is conceptualized as stemming from a positive appreciation of a stimulus (in the case of pedophilia a prepubescent child) that triggers sexual arousal. The stimulus is hypothesized to be evolutionarily determined to some degree but also shaped via learning and operant conditioning principles. A key feature of the model is that sexual arousal is conceptualized as an emotional response that can be amplified by other emotions via the process of excitation transfer (Zillmann, 1996). Using the example of pedophilia, Smid and Wever (2019) hypothesize that individuals may develop pedophilia through experiencing the emotion of endearment towards children which transfers and prompts a sexual arousal response; particularly for sexually overinhibited individuals. In other words, the emotionally stimulating experience of the child becomes transferred to sexual arousal and revisited for sexual arousal purposes; increasing the likelihood of pedophilia via operant conditioning. Smid and Wever's model is particularly useful since it touches upon how pedophilia itself might develop and become maintained. However, like Seto's MFM, the theory's explanatory targets (i.e., what the theory has selected to explain) are broad and so the Incentive Motivational Model is unable to fully elucidate the construct of pedophilia and its etiology.

Problems with Current Theoretical Explanations of Pedophilia

Using only a single factor or a theoretical framework designed to describe various types of sexually abusive behavior makes it difficult for professionals to accurately identify the specific mechanisms underlying pedophilia (see Wilshire, Ward, & Clack, in press). Current theories do not adequately define or explain the composition of pedophilia. Explaining the construct of pedophilia itself is important since this construct represents a key risk factor implicated in child sexual abuse (Seto, 2017b; Smid & Wever, 2019) and so understanding it will inform prevention and treatment approaches. Many researchers have argued that we must begin focusing on the factors underpinning inappropriate sexual attraction in order to fully understand inappropriate sexual behavior rather than focusing on factors that might well be implicated across crimes more generally (Schmidt & Imhoff, in press; Smid & Wever, 2019). In my view, three key features of pedophilia have not yet been adequately explained by any single preexisting theory. These key features are: (1) the professional divergences that exist regarding the permanency or flexibility of pedophilia, (2) the apparent rarity of female pedophilia relative to males, and (3) the varying symptoms of pedophilia exclusivity (with some individuals showing little to no sexual interest in adults and others holding co-existent sexual interest in adults).

Approach Taken to Developing a Theory of Pedophilia

A multifactorial theory with a clear explanatory target that draws upon empirically informed—yet differing—levels of explanation (e.g., biological, environmental, neurodevelopmental, and psychological) is required to describe the composition and possible etiology of pedophilia. I draw upon the *Phenomena Detection Method of Theory Construction* (PDM-TC; Ward & Clack, 2019). The PDM-TC is a meta-theoretical conceptual framework designed to guide scientific theory construction of clinical phenomena (see also Haig, 2014). Emphasis is placed

upon providing compositional explanations of constructs in which clinical symptoms are identified and described to promote insight into the etiological mechanisms underpinning them. The PDM-TC approaches scientific theory construction pluralistically and views meaningful clinical scientific explanation as comprising multiple theories focusing on differing temporal dimensions and various levels of abstraction. The method of theory construction associated with the PDM-TC is made up of three distinct phases: (1) *choosing an explanatory target or targets for the theory*, (2) *generating a compositional description of the target(s),* and (3) *generating a basic etiological framework of explanation.* When utilizing the PDM-TC, I assume an *embodied approach* (see Dent, Nielsen, & Ward, 2020; Nielson & Ward, 2018). This conceptualizes the mind and body as being highly interrelated with experience and psychological functioning being shaped by physical experiences and processes (e.g., "sexually significant" internal sensations; Jackson & Scott, 2007; p.100). In other words, pedophilia is conceptualized as being holistically part of the person rather than a condition that individuals suffer from (cf. DSM-5; APA, 2013).

Explanatory Targets

Adequate theory requires the appropriate selection of a target to explain (see Hawkins-Elder & Ward, 2019). Currently, single factor explanations of pedophilia typically use DSM as the explanatory target. However, the DSM is recognized as being conceptually flawed regarding diagnostic specificity (Beech, Miner, & Thornton, 2016; Berlin, 2014). Furthermore, the explanatory targets of multifactorial explanations incorporating pedophilia are various (e.g., sexually abusive behavior towards children or adults; Seto, 2008; 2017b; 2018; Smid & Wever, 2019) which creates confusion; limiting clinical utility. Selecting a theory's explanatory targets

should be firmly linked to key clinical phenomenon or symptoms central or highly relevant to the problem being described (Hawkins-Elder & Ward, 2019).

In the case of pedophilia, key symptoms include sexual arousal, fantasies, and/or desire in relation to prepubescent children (Grundmann, Krupp, Scherner, Amelung, & Beier, 2016; Williams, 2017) as well as abusive or non-abusive sexual behavior involving prepubescent children (e.g., contact sexual abuse or masturbation to fantasies of prepubescent children; Blalock & Bourke, 2020; Horn, 2020), and negative or positive affect (e.g., distress or enjoyment associated with pedophilia; see Blalock & Bourke, 2020; Ward, Louden, Hudson, & Marshall, 1995). Research studies and leading existing theories, however, suggest that the primary underpinning symptoms of pedophilia are a *sexual interest* in or a *sexual preference* for prepubescent children (Blagden, Mann, Webster, Lee, & Williams, 2018; Horn, 2020; Li, 1991; Seto, 2008, 2017b, 2018; Smid & Wever, 2019). In fact, these symptoms are likely to elicit secondary symptoms such as sexual arousal (i.e., physiologically), fantasies (i.e., cognition), and desire (i.e., motivation)[3]. The primary symptoms of a sexual interest or preference for prepubescent children are also key in predicting sexual reoffending against children (Eher, Olver, Heurix, Schilling, & Rettenberger, 2015; Hanson & Morton-Bourgon, 2005).

The terms sexual interest and sexual preference are sometimes used interchangeably by professionals writing about pedophilia and so differentiating them is critical for bringing conceptual clarity to this field. In the CTEoP, sexual interest is used to refer to the types of person (age-wise) a person is interested in sexually. Sexual preference (sometimes used interchangeably with *sexual orientation*; see

[3] I also recognise that a sexual interest in or preference for children may become both formed and strengthened by sexual arousal, fantasy, and desire (Hoffmann, 2007; Moser, 2016).

Quinsey & Lalumière, 1995), on the other hand, is used to refer to a more powerful and extreme form of sexual interest (in this case a sexual interest in a prepubescent child or children) that is believed to be pervasive and longstanding (see Moser, 2016). Choosing these two explanatory targets—central to pedophilia—ensures that the the composition of pedophilia is more accurately detailed so that key descriptions of the possible mechanisms underlying pedophilia can be generated (see Ward & Clack, 2019). Thus, I am conceptualizing a sexual interest in or a sexual preference for pre-pubescent children as defining features of pedophilia from which other symptoms stem.

Generating a Compositional Description of Pedophilia

Explaining the composition of a complex concept such as pedophilia requires the recruitment of varying models or explanations that focus on differing elements or levels of analysis (Ward & Clack, 2019). The theory that I will introduce recruits explanations at the levels of biology (i.e., genetics), environment (i.e., conditioning and social learning principles), neurology (neurodevelopment), and psychology (i.e., emotional congruence with children) to account for the explanatory targets of pedophilia. This produces a 'coalition' of explanations designed to work together in describing the basic constitution of pedophilia and its etiology; consistent with a PDM-TC approach. Uniting these accounts is an important step for explaining the divergent research findings relating to pedophilia. It also allows neurodevelopmental and learning perspectives that have previously been pitted against each other (see Fazio, 2018) to co-exist more harmoniously. In short, the theory first seeks to describe the constellation of factors that constitute a *sexual interest* or *preference* for prepubescent children.

Generating an Etiological Description of Pedophilia

Once empirical evidence relevant to the explanatory targets of a *sexual interest* or *sexual preference* for prepubescent children have been adequately composed and described, this evidence requires temporal modelling so that hypotheses regarding the causal relations between the varying levels of analysis constituting the explanatory targets are mapped appropriately (Ward & Clack, 2019). The varying models or explanations describing pedophilia can then be outlined; placing particular emphasis on potential mechanisms and etiological processes (Ward & Clack, 2019). The aim here is for the explanatory targets of *pedophilia* to be described at multiple levels of analysis.

The Compositional Explanatory Theory of Pedophilia (CEToP)

An overview of the CEToP Framework is available in Figure 1. The CEToP views the explanatory targets of a *sexual interest* or *preference* for prepubescent children as being comprised of biological, environmental, and psychological factors. Within the CEToP, a sexual *interest* in prepubescent children is conceptualized as being a different clinical phenomenon or symptom of pedophilia relative to holding a sexual *preference* for prepubescent children. Furthermore, the factors comprising each symptom are conceptualized as being differentially weighted. For example, a sexual interest in prepubescent children that is malleable is likely to be more heavily comprised of environmental factors relative to an immutable sexual preference for prepubescent children which is likely to be more heavily comprised of biological and neurological factors. In terms of modelling etiological explanations, the CEToP organizes the composition of a sexual interest or preference along two dominant pathways: *environmental* and *biological*. While each of the pathways are more heavily comprised of particular factors, they are also likely to consist of the other relevant factors albeit to a lesser degree. Understanding the constitution of the two

key explanatory targets provides the framework of the CEToP; allowing a descriptive etiological account to be generated. These explanatory targets are central to pedophilia and are hypothesized to drive other secondary pedophilia symptoms (e.g., fantasies, arousal, desire).

The most compelling explanations proposed to account for pedophilia described earlier in this manuscript cut across varying levels of analysis (e.g., genetics, neurodevelopment, social learning theory). Prior to examining the etiology of a sexual interest or preference for prepubescent children, the CEToP examines the make-up of each explanatory target according to the level of analysis adopted by each explanation (see Table 1). The environmental pathway of the CEToP refers to the explanatory target of a *sexual interest* in prepubescent children. This clinical symptom is hypothesized to represent a relatively malleable sexual interest that will be non-exclusive (i.e., it will co-exist with some form of age appropriate sexual orientation). It is hypothesized to be predominantly comprised of environmental factors with psychological components. The biological pathway refers to the explanatory target of a *sexual preference* for prepubescent children. This clinical symptom is hypothesized to represent a relatively unchangeable sexual preference that may or may not be exclusive. It is predominantly comprised of biological (evolutionary, genetic), and neurological components (including environmental-epigenetic processes); but also—to a lesser degree—psychological and generic environmental factors.

The CEToP organizes the composition underlying each of the explanatory targets temporally along two dominant pathways (environmental or biological). Each pathway is comprised of the two key stages of *1. Early Development* (i.e., factors influencing conception and fetal/child development) and *2. Sexual Orientation*

Development (i.e., emerging sexual orientation in adolescence or early adulthood) that culminate in *3. The Key Clinical Symptoms* (Explanatory Targets) of a *sexual interest* or *sexual preference* for prepubescent children. The early developmental stage is conceptualized to set the stage for later sexual development and includes influences in the first part of an individual's life and factors at play prior to and at the time of conception, throughout fetal neurodevelopment, birth, and childhood neurodevelopment (i.e., < 12 years). At the end of the early development stage of the CEToP, an individual is either biologically predisposed towards developing pedophilia or not.

During the second stage of the CEToP, in the absence of any key theoretical frameworks explaining how sexual orientation might unfold more generally (see Cook, 2020; Schmidt & Imhoff, in press), I draw upon multidisciplinary work to piece together a series of basic hypotheses. Here, research suggests that sexual orientation development regarding members of the same, opposite, or both sexes occurs from puberty to late adolescence during sexual maturation when sexual hormones and associated feelings begin to emerge (Patton & Viner, 2007; Saewyc, 2011). Sexual orientation development is generally understood to be largely influenced by biological factors (e.g., genetics), and intrauterine influences (e.g., hormone levels; see Cook, 2020). However, the period of time during puberty involves a surge of brain development, including white matter volume increases and development of the prefrontal cortex (Ladouceur, Peper, Crone, & Dahl, 2012; Mychasiuk & Metz, 2016) and is also a period particularly vulnerable to environmental and epigenetic effects (Mychasiuk & Metz, 2016). Whilst "sexual orientation" usually refers to an individual's sexual attraction towards members of the same, opposite, or both sexes Seto's (2017a) conceptualization of a stable sexual

preference for age is included in the CEToP and is hypothesized to develop later than sexual gender orientation (see Balthazart, 2011; Bao & Swaab, 2011; Freund & Kuban, 1993). Here, a stable sexual preference outside age appropriate targets is hypothesized to be strongly connected with biological vulnerabilities. Unlike sexual gender orientation, which children appear to become aware of prior to puberty (Calzo & Blashill, 2018), individuals experiencing biologically based pedophilia may not realise that their sexual attractions are at odds with their peers until adolescence or even later. This would fit with existing research showing that some pedophilic individuals adopt an identitiy consistent with pedophilia during adulthood (see Cash, 2016). At stages 1 and 2 of the CEToP, the two factors of biology and environment continuously and dynamically interact to impact stage 3 (i.e., the development, or not, of a sexual interest or sexual preference for children).

Pedophilia Pathways

Environmental Pathway

Tozdan and Briken (2015) noted a broad range of age onset for pedophilia in community males. They also found the later the age of onset, the more men perceived their pedophilia to be flexible. This suggests that a pure biological stance will not accommodate all experiences of pedophilia. The environmental pathway represents a preliminary framework of etiological mechanisms associated with the symptom of developing a *sexual interest* in prepubescent children and is predominantly comprised of environmental factors. The term ‘sexual interest’ used in relation to this pathway does not reflect a long term biologically based orientation but an adjunct learnt sexual attraction.

Early development. For this pathway, at the early development stage, individuals are not deemed to be biologically predisposed or are only very weakly biologically

predisposed towards pedophilia. For example, at conception, individuals in the environmental pathway are likely to hold low levels of genetic inheritance or of an evolutionary predisposition to prefer prepubescent children sexually (e.g., being female). For these individuals, there is no biological vulnerability to become unlocked via pre, peri, or post-natal epigenetic modification and no notable impairments in the brain regions that may be associated with sexual arousal processing (e.g., white matter connectivity, the anterior cingulate cortex, amygdala, superior parietal lobule; Ruesink & Georgiadis, 2017; cf. the biological pathway). Instead, the mechanisms involved in pedophilia generation are hypothesized to be environmental (including culture) and include some psychological factors across the stages.

At Stage 1 of the CEToP, children begin to develop emerging psychological factors as a result of the continuing relationship between their biology and environment. Important emergent factors for the development of a sexual interest in children are likely to be inappropriate sexual scripts (see Ward & Siegert, 2002, Gagnon, 1990) and associated pro-abusive cognitions. These factors may emerge as a result of social learning associated with sexual abuse or societal sexualization of children and lay the foundations for environmentally-learnt pedophilia to take hold during the sexual orientation development stage. Sexual scripts refer to learnt cognitive representations of how to behave sexually that enable individuals to interpret sexual cues and encounters; providing boundaries to sexual situations (Ward, Polaschek, & Beech, 2006). Sexual abuse and/ or the societal sexualization of children may result in the development of inappropriate sexual scripts that (1) distort an individual's perception of various cues signalling sex (e.g., cognitive, emotional, physical) in relation to children, and (2) result in the incorporation of pro-abusive norms and beliefs.

Sexual orientation development. As noted earlier, unfortunately, we lack professional understanding of how to explain the development of sexual orientation/interests more generally (Cook, 2020; Schmidt & Imhoff, in press). Consequently, in developing the CEToP, I draw upon multidisciplinary work to piece together a series of basic hypotheses regarding sexual orientation development. At the sexual orientation development stage, following the formation of gender orientation, I hypothesise that individuals characterized by the environmental pathway develop an age appropriate sexual orientation but also develop an environmentally learnt sexual *interest* in a prepubescent child or children alongside or following this. This ascertation would fit with recent conceptualisations that sexual interests are, to a certain extent, learned behaviors that continue throughout life (Schmidt & Imhoff, in press). Although a genetic inheritance or evolutionary predisposition to prefer prepubescent children sexually is not implicated in this pathway, other biological factors may be important. So, for example, a female child may have inherited a propensity for a high sex drive (biological) and experience trauma and sexual abuse at the hands of adult men (environment) that interact and result in her developing the emerging psychological factors of unhealthy preoccupation with sex, inappropriate sexual scripts, and pro-abusive cognitions supporting child-adult sex. The CEToP predicts that, when sexual orientation is developing, this could lead to the female masturbating to thoughts and fantasies of prepubescent children (i.e., non-exclusive learnt pedophilia). Here, a pedophilic sexual *interest* (not orientation; see left hand side of Figure 1, Stage 3) may be learnt via conditioning (Laws & Marshall, 1990; Marshall & Barbaree, 1990; Marshall & Eccles, 1993; Marshall, O'Brien, & Marshall, 2009; McGuire et al., 1964). In this particular case, social learning theory provides the catalyst for conditioning of sexual interests. However, in some cases the

development of a learnt sexual interest in a child or children could be kickstarted by the process of excitation transfer which has been hypothesized to occur for individuals who are sexually overinhibited (i.e., Smid & Wever, 2019). Here, an experience of sexual arousal becomes amplified via another emotionally stimulating experience related to children such as endearment (Smid & Wever, 2019). Thus, psychological functioning becomes shaped by physical experiences and processes (e.g., "sexually significant" internal sensations; Jackson & Scott, 2007; p.100 i.e., an *embodied approach*; Dent et al., 2020; Nielson & Ward, 2018).

It is worth noting that the environmental pathway reflects the usual process of age appropriate sexual orientation development in the absence of any biological propensity towards pedophilia. Here, an individual can develop a pedophilic sexual interest at any time in their life (e.g., many years following an age appropriate sexual orientation)[4]. It is hypothesized that pedophilia that is 'learnt', and not biologically based, will never become exclusive since a non-pedophilic sexual age orientation has already been formed and co-exists with the 'learnt' pedophilic sexual interest. Both men and women may occupy this pathway to pedophilia. However, female pedophilia is hypothesized to be comparatively rare—in part—due to sex differences in rates of sexual fantasy and masturbation (Jones & Barlow, 1990; Robbins, Schick, & Reece, 2011).

Biological Pathway

The biological pathway represents a framework of etiological mechanisms associated with the symptom of developing a sexual preference towards prepubescent children and is comprised largely of biological and neurological factors (including

[4] I do not conceptualise a relatively fleeting sexual thought or interest in pre-pubescent children to fit this pathway.

environmental-epigenetic processes). Here, during early development, evolutional and genetic inheritance factors are predicted to form a vulnerability factor that—in combination with environmental experiences (particularly those associated with epigenetic changes)—results in the development of a longstanding and immutable sexual preference for children. In this sense, the biological pathway has features akin with a dual risk or diathesis-stress explanation of pedophilia in which biological factors (or vulnerabilities) combine with environmental factors (or stress) to result in pedophilia and its chronicity. This biological vulnerability is hypothesized to be far more prominent for males, relative to females, due to evolutionary influences shaping male sexual preferences (see Quinsey & Lalumière, 1995 or Seto, 2018).

Early development. At conception, individuals in the biological pathway are likely to hold a genetic vulnerability to prefer prepubescent children sexually (i.e., via genetic variants or epigenetics). Thus, the CEToP views pedophilia as being brought about via numerous genes rather than any specific pedophilia gene. Pre or peri-natal epigenetic modification (e.g., via pathogen exposure; Seto, 2018 or metabolic conditions) is the key mechanism hypothesized to generate the chemical amendments required to activate the various genes associated with pedophilia. Thus, it is possible to have a biological predisposition for pedophilia that (1) is not activated at this stage yet becomes later activated in childhood or puberty as a result of environmental perturbations such as trauma and associated epigenetics (see Morrison, Rodgers, Morgan, & Bale, 2014) or (2) is not activated at this stage and never is due to positive environmental factors that foster healthy neurodevelopment.

Where epigenetics favor fetal neurodevelopment towards pedophilia, brain structure and organization may reflect this via impairments to brain regions involved in sexual arousal processing. The child's continuing neurodevelopment and associated

brain structure may be impacted further by the dynamic interaction of environmental factors and epigenetic processes as well as chance biological insult (e.g., causal or symptomatic head trauma). Childhood trauma, for example, is likely to exacerbate pre-natal pedophilia neurodevelopment or provoke epigenetic changes that kickstart this development via epigenetics (see McIntosh, 2019) with males being more vulnerable to such effects (see Teicher, Glod, Anderson, Dumont, & Ackerman, 1997).

The individual leaves childhood with either a biological predisposition towards pedophilia (right hand side of Figure 1) or not (left hand side of Figure 1). Prior to stage 2, however, is an emergent psychological factor hypothesized to be most strongly associated with the biological pathway; that is, emotional congruence with children (Finkelhor, 1984; Wilson, 1999). Emotional congruence may form as a result of being fantasy prone (Wilson & Barber, 1981). Fantasy proneness has been linked to childhood abuse and is hypothesized to form as a trauma coping mechanism (Rhue & Lynn, 1987; Wilson & Barber, 1981). It has also been associated with the development of psychopathology (Sánchez-Bernardos, Hernández Lloreda, Avia, & Bragado-Alvarez, 2015), and is conceptualized as being cognitively resourceful (Henderson, Gold, Mcord, 1982). Drawing together these principles, I hypothesize that emotional congruence with children—which involves an inappropriate focus on the childhood world and characteristics of childhood (e.g., innocence, fun) emerges as a facet of fantasy proneness for individuals in the biological pathway when faced with traumatic childhood events. The slant towards children via fantasy proneness is hypothesized to stem from neurodevelopmental patterns associated with the biological predisposition towards pedophilia. This characteristic then persists into adolescence and later adulthood.

Sexual orientation development. At stages 2 and 3 of the CEToP, it is hypothesized that a biologically based sexual preference for prepubescent children unfolds exclusively or non-exclusively (see single-ended and double-ended arrows at Stage 3; right hand side of Figure 1) during sexual maturation (i.e., in place of or alongside the age appropriate sexual orientation that develops for the environmental pathway). The exclusivity of biologically based pedophilia is hypothesized to be related to the intensity of Stage 1 biological, epigenetic, and environmental-cultural factors and their interplay. For example, an individual whose genetic/evolutionary risk and fetal development favors pedophilia and whose biology or environment favors the development of child-related emotional congruence or inappropriate sexual scripts (Ward & Siegert, 2002) is predicted by the CEToP to be more likely to be exclusively pedophilic. This combination of factors, however, is hypothesized to be rare; corresponding with research showing a minority of pedophiles are exclusive (see Dombert et al., 2016).

Some individuals experiencing exclusive pedophilia may develop pro-abusive beliefs (i.e., that children are sexual entities; Ward & Keenan, 1999) as a result of inappropriate sexual scripts that developed during childhood or adolescence as a result of abusive experiences or cultural influences. Others may develop pro-abusive cognitions *to make sense* of their sexual arousal, desire, and possible emotional congruence in relation to prepubescent children (Abel, Becker, & Cunningham-Rathner, 1984). However, the development of such cognition is likely to be dependent on various factors such as being more fantasy prone as well as environmental factors (i.e., social learning) and so will vary from individual to individual. Biologically predisposed pedophilic individuals who have positive experiences at Stage 1 or 2 that do not encourage neurological development in favor of pedophilia are hypothesized to

be more likely to develop non-exclusive pedophilia. Or, in cases where it has not been unlocked at all; an appropriate sexual age orientation (i.e., towards peers, adults).

Late Onset Biological Pedophilia

The CEToP would locate cases of late onset pedophilia associated with the alteration of sexual preferences to include prepubescent children as being associated with acquired neurological damage at Stage 2; following the development of sexual age orientation. Here, individuals whose sexual orientation was initially age appropriate—and who were not biologically predisposed at stage 1 (or whose biological predisposition was never unleashed—switch to biological pedophilia as a result of an experience in adulthood that involves brain injury. This is depicted by the arrow at Stage 3 of Figure 1.

CEToP Overview

The CEToP examines the composition and possible causes of pedophilia via an overarching framework that reconciles biological and environmental explanations and accounts for three key features of pedophilia yet to be adequately explained by any single multifactorial theory (i.e., variations in pedophilia manipulability and exclusivity, as well as low female pedophilia prevalence). The CEToP synthesizes biological and environmental accounts of pedophilia through specifying two key pathways responsible for the development of its central clinical features (i.e., a sexual interest or preference for prepubescent children). In the sections that follow, I appraise the CEToP according to several scientific theory criteria.

Desirable Features of Good Clinical Theory

According to influential scholars, several virtues characterize sound scientific theory both generally (Hooker, 1987, Schindler, 2018) and within the forensic-clinical domain (Ward et al., 2006). These include: *empirical adequacy* (i.e., theory should be

underpinned by adequate research evidence), *explanatory depth* (i.e., theory should exhibit depth of description when referring to processes and mechanisms), *unification* (i.e., theory must synthesize previously isolated theory or research evidence), *coherence* (i.e., explanations within the theory must work together coherently), and fertility (i.e., theory should generate new research hypotheses or clinical interventions; see Hooker, 1987 or Schindler, 2018).

CEToP Appraisal

The CEToP has been generated from an emerging scientific research field in which neurodevelopmental research and theory have recently become prominent. Consequently, although the CEToP is underpinned by research evidence (i.e., empirical adequacy), it does lack explanatory depth commensurate with the scientific research available in the field. For example, the etiological mechanisms proposed within each of the CEToP pathways represent basic etiological sketches. As the research field develops, however, it is anticipated that these mechanisms can become further detailed or amended accordingly. In terms of theoretical unification, the CEToP synthesizes previously isolated biological and learning accounts of pedophilia through specifying two key pathways responsible for the development of its central clinical features (i.e., a sexual interest or preference for prepubescent children). These accounts are synthesized coherently in the CEToP since both pathways are conceptualized as necessarily involving environmental and biological factors although each pathway's constitution is comprised primarily by one or the other. The key difference across the two pathways is that environmentally-based pedophilia is conceptualized to represent a learnt sexual interest that is amenable to change, while biologically based pedophilia is conceptualized as being a fixed form of sexual orientation that is unlikely to change. In the CTEoP, permanency is synonymous with

biologically induced pedophilia and pedophilia exclusivity is explained according to the severity of interacting biological drivers and environmental factors throughout the early development and sexual orientation formation. In terms of clinical utility, the CEToP can be used to generate numerous new predictions relevant to research and clinical interventions which are detailed below.

Research utility. The CEToP's environmental and biological pathways associated with the central phenomena of pedophilia allow predictions about the characteristics and features of each pathway to be generated (see Table 2). Cantor and his colleagues (Cantor, 2018; Fazio, Dyshniku, Lykins, & Cantor, 2017; Dyshniku et al., 2015) proposed pedophilia as being a type of sexual orientation of neurodevelopmental origin. They cited evidence of pedophiles exhibiting a higher rate of physical characteristics associated with problematic neurodevelopment relative to control groups (Cantor et al., 2005) and brain irregularities (Cantor et al. 2008) that might indicate problems with sexual responses to youthfulness. In the CEToP, these individuals are described via the biological pathway and are assumed to hold a strong evolutionary and genetic propensity towards developing pedophilia as a form of sexual orientation which becomes unlocked by epigenetic factors at play both in the uterine/ post-natal periods and/ or adolescent periods. Since a key aspect of the biological pedophilia pathway relates to the early manifestation of this condition unfolding via fetal neurodevelopment and associated brain pathology, we can make predictions regarding the likely features of these individuals relative to pedophiles whom have acquired pedophilia as a sexual *interest* via the mechanism of learning.

Research has examined possible markers of neurodevelopmental issues in terms of pedophiles' MPAs, non-righthandedness (Blanchard et al., 2007; Cantor et al. 2004; 2005), brain pathology (Cantor et al., 2008; 2015; Poeppl et al. 2015), and

head injury (Blanchard et al., 2003). Yet this work has been conducted in relative isolation. The CEToP theory predicts that biological pathway pedophiles will hold markers across these areas that co-occur such as a higher prevalence of MPAs, non-righthandedness, associated brain pathology, and/or self-reports of childhood head injury relative to control groups. Furthermore, biological pathway pedophiles who show clustering of these variables should be more likely to be male, will hold exclusive or non-exclusive pedophilia, and view their pedophilia as permanent and highly resistant to change relative to persons with environmental pedophilia. In contrast, individuals whose pedophilia has developed via environmental-learning should not hold prominent biological markers of pedophilia, could be male or female, will hold pedophilia non-exclusively and are likely to view their pedophilia as non-permanent and amenable to change. Thus, a simple cluster analysis of these variables could be an elightening way of examining the CEToP's key predictions. Furthermore, if we presume that permanent and unchangeable pedophilia is, indeed, biologically derived and that non-permanent pedophilia is predominantly learning based, then a step forward in our investigations would be to compare individuals' qualitative descriptions of their pedophilia via interview. In their Phenomena Detection Method (PDM) of constructing theory, Ward and Clack (2019), argue that understanding the symptoms of clinical phenomena, in this case pedophilia, might offer valuable insight into the mechanisms and processes that caused it. As a starting point, if the CEToP's key tenets are accurate, then we expect that there will be varying perspectives on the element of permanency and that these will be linked to the pathway descriptors outlined in Table 2.

Clinical utility. Most prevention and treatment programs tend to side with either a biological or environmental etiological explanation of pedophilia development. For

example, programs adopting a primarily biological deterministic view on pedophilia teach clients that their pedophilia is a form of biological sexual orientation that cannot be altered and instead requires careful management (e.g., Dunkelfeld; Beier, 2016). Programs advocating an environmental learning account of pedophilia, however, tend to teach clients that their pedophilia has been learnt and so is amenable to change and 'relearning' using strategies such as masturbatory reconditioning (Marshall, Marshall, Serran, & Fernandez, 2006; Murphy, Bradford, & Fedoroff, 2014). A number of issues might arise from mistakenly treating environmentally acquired pedophilia using a biological perspective and vice versa. First, framing learnt pedophilia as biologically acquired suggests that pedophilia is unchangeable; making it unlikely that clients with learnt pedophilia will attend to exercises designed to alter and reduce their sexual interest in prepubescent children. In other words, there may be cases in which pedophilia can be relearnt or its intensity reduced and these opportunities are being missed (see Gannon et al., 2019). Second, mistakenly labelling biological pedophilia as environmentally acquired and amenable to change could be particularly damaging for these pedophiles who are likely to have a strong sense of their pedophilia being fixed and unchangeable (see Cantor, 2018). Framing biological pedophilia as environmental could create a disruption in the therapeutic alliance between therapist and client (see Beech & Mann, 2002) leading pedophilic individuals to lack motivation in areas of treatment that may be of particular benefit to them (e.g., managing inappropriate sexual thoughts/self-regulation skills). Using the CEToP framework, clinicians and treatment providers need to consider pedophilic individuals as holding unique etiological pathways to pedophilia, rather than as a homogenous group requiring the same overall explanation for their condition. At present, it seems unlikely that clinicians would be able to definitively define

biological versus environmentally acquired pedophilia with confidence based on the criteria outlined in Table 2. Nevertheless, the individual themselves may report a clear sense of the permanency or development of their interest/orientation which may function as a key indicator. Thus, a priority for future research should be to empirically examine the key predictions of the CEToP to develop our knowledge of biological and environmentally acquired pedophilia so that these individuals can be identified and managed appropriately.

Conclusion

In this manuscript, I have introduced a compositional explanatory theory of pedophilia. This theory has been developed to describe and explain the key phenomena that comprise pedophilia rather than the abusive behavior associated with pedophilia which is likely to involve a different set of processes. The CEToP's etiological framework is, to some extent, limited by the current depth of research knowledge in the field. However, it holds key advantages over existing theories that focus on multiple explanatory targets. The CEToP acknowledges both biological and environmental factors as being important in the explanation of the key explanatory targets associated with pedophilia (i.e., a sexual interest in or preference for prepubescent children). Although pre-existing theories have acknowledged both factors to some extent, there has been no attempt to reconcile opposing perspectives and research findings regarding the mutability of pedophilia. The CEToP has attempted to provide a solution to this problem through advocating that both perspectives are required to explain the central symptoms of pedophilia. Additionally, the CEToP has attempted to explain the apparent rarity of female pedophilia relative to males as well as varying symptoms of pedophilia exclusivity. The CEToP generates several key hypotheses associated with each of the fundamental pathways

and provides clinical professionals with plausible answers to key questions regarding the origins and mutability of pedophilia. In generating this framework, the CEToP provides a systematic framework for identifying targeted research priorities and providing evidence-based practice for the management and response to pedophilia.

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Table 1. Indicative Composition of the Two Central Explanatory Targets of Pedophilia

Level of Analysis	Key Process	Description	Explanatory Target	
			Sexual Interest	Sexual Preference
Biological	Evolution-based brain modules	Quinsey and Lalumière's (1995) account suggests that men hold a series of evolutionarily determined independent sexual preference brain "modules" that detect gender, youth, and physical build. When men develop a sexual preference for prepubescent children the physical build detector is believed to have independently failed. This results in a male who views prepubescent children preferentially since they are interested in the characteristics of youth in the absence of a brain module signalling sexual maturity.		✓
	Genetic	Genetic explanations assume that a sexual preference for prepubescent children is, in part, genetically determined. Research demonstrates that such preferences are more frequent amongst families (see Gaffney et al., 1984) and behavioral genetics modelling suggests genetic involvement (Alanko et al., 2013).		✓
Environment	Epigenetic processes	A number of researchers assert that long-term biological DNA modification is likely to be responsible for the development of a sexual preference towards prepubescent children in the absence of DNA sequence alterations (Tenbergen et al., 2015). These environmental effects determine gene activation and neurodevelopment (see Goldman, 2012).		✓

	Learning (Behavioral)	Laws and Marshall (1990) propose that classical and operant conditioning principles explain the development of a sexual interest in prepubescent children.	✓	
	Learning (Social)	Laws and Marshall (1990) propose social learning as being critical for initial development of a sexual interest in prepubescent children. This account draws upon Bandura (1973, 1977) in assuming that learning can take place as a result of direct modelling, vicarious learning, or symbolic learning.	✓	
Neurological	Structural Brain Pattern/Neural network	Neurological accounts contend that a sexual preference for prepubescent children is linked to neurological problems that occur during gestational development/ childhood (Blanchard et al., 2003; Fazio et al., 2014) or later in adulthood as a result of brain insult (Burns & Swerdlow, 2003). Research indicates some structural differences in the brains of variously defined pedophiles who display the symptom of having offended (Schiltz et al., 2007; Poeppl et al., 2015).		✓

Psychology	Emotional Congruence with Children	Researchers have posited that emotional congruence with children is an important psychological construct connected with a sexual preference for prepubescent children (Konrad, Kuhle, Amelung, & Beier, 2018). The concept of emotional congruence with children has been found to be particularly prevalent in pedophilic abusers relative to other types of child abuser (Wilson, 1999; see also Hermann, McPhail, Helmus, & Hanson, 2015; McPhail, Hermann, & Fernandez, 2014) and is a predictor of sexual reoffending (McPhail, Hermann, & Nunes, 2013).	✓	
	Inappropriate sexual scripts	Ward and Siegert (2002) propose that some individuals who abuse children have developed inappropriate sexual scripts. These are learnt cognitive representations of how to behave sexually. Experiences of sexual abuse and/or the societal sexualization of children may result in the development of inappropriate sexual scripts that distort an individual's perception of various cues signalling sex in relation to children and result in pro-abusive cognition.	✓	✓
	Pro-abusive cognition that sexualizes prepubescent children	Ward and Keenan (1999) contend that some individuals who abuse children view prepubescent children in sexual terms. A cognitive association between children and sex has been reported for child abusers of prepubescent children (see Gray, Brown, MacCulloch, Smith, & Snowden, 2005) but not older children (Brown, Gray, & Snowden, 2009).	✓	✓

Table 2: Theorized characteristics of each CEToP Pedophilic Pathway

Characteristic	Pedophilia Pathway	
	Environmental	Biological
Biological markers of pedophilia	Lack of biological markers	MPAs, non-righthandedness, and/or brain pathology/injury
Gender	Male or female	Male
Permanency of pedophilia	Not permanent, flexible to change	Permanent, highly resistant to change
Exclusivity of pedophilia	Non-exclusive	Exclusive or non-exclusive

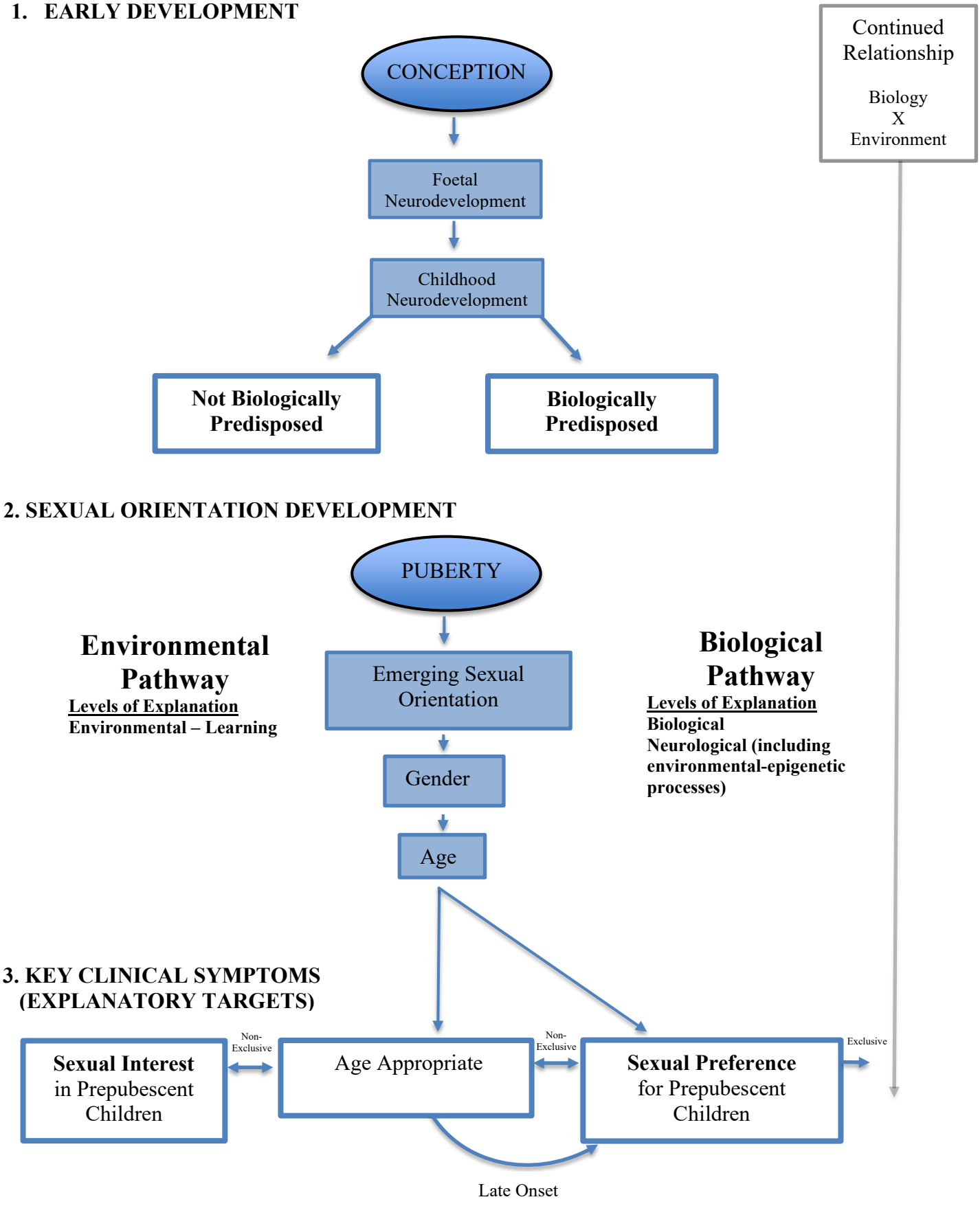

Figure 1. The CEToP Framework