A systematic review of evidence based treatments for conduct disorder in adolescents: Are they aligned with the developmental pathways research for conduct disorder: Towards a more effective treatment model.

Guy T. Dobson, BA (Hon); Student Number – c2106120

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Declaration

“The contents of this Research Project are my own work and have not been submitted previously for the purpose of assessment for a Masters or any other degree”

Student Name: ________________________________

Signed: _______________________________ Date: ________________

Principal Supervisor’s Name: ________________________________

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Abstract
In the wake of the recent inclusion of a specifier in the DSM 5 (American Psychiatric Association (APA), 2013) for limited prosocial emotions, specifically callous-unemotional traits (CU traits) within conduct disordered (CD) children and adolescents, the current paper reviews the available research and literature on the utilisation of sub-typing CD for the purpose of informing assessment and subsequent treatment approaches. The review focused on three issues: Firstly on whether the practice of sub-typing CD is clinically important to informing the treatment type and level of intensity for adolescents with severe conduct problems (CPs); Next on whether the sub-typing of CD is routinely utilised in the assessment process by evidence based treatment modalities to inform treatments. In particular, differentiating between those with adolescent onset (A/O) and those with untreated childhood onset (C/O) for whom the ongoing risks are becoming more critical. Finally, coinciding with the recent addition of specifiers in the DSM – 5 (APA, 2013) which effectively designate a further subgroup of individuals with limited prosocial emotions (CU traits), the review examined whether the subject treatment modalities are adequately positioned to be effective.

Results: Most studies did not take limited prosocial emotions (CU traits) into account as this is new research, only recently included in DSM 5. Additionally, the majority of studies tend to aggregate A/O and C/O together and treat them as a homogenous group (single pathway approach). Instead of utilising the developmental pathway approach to assessment and treatment that has been suggested in successive publications of the DSM including the DSM 5 (APA,
2013), a broad spectrum treatment based on the tenets of each particular treatment modality, is applied.

An evidenced based model is presented that has been informed by the suggested developmental pathways that lead to CD. The aim of the model is to highlight the growing complexity and diversity of CD with increasing age and offer guidance with clinically informed assessment and treatment.
Introduction

Conduct disorder (CD) consists of a particularly multifarious group of children who have important distinctions in the developmental courses of their behavioural difficulties. The term equi-finality (a concept which recognizes that the same outcome can be the result of many different developmental processes) has been used to refer to this process (Frick, 2003). One example of this is ‘age of onset’ of CD which has similar manifestations of antisocial behaviour when viewed in adolescence, but may represent two distinct clusters of the disorder. Correspondingly, research suggests distinguishing between children whose severe conduct problems (CPs) begin early in childhood and those whose antisocial behaviour begins in adolescence, as they exhibit distinct developmental trajectories and correlates (Moffit, 2006; Frick, 2003; Moffit, 1993).

Consistent with this, the Diagnostic and Statistical Manual of Mental Disorders (DSM), has acknowledged two subtypes of conduct disorder; childhood onset (C/O), and adolescent onset (A/O) since the publication of the DSM IV (American Psychiatric Association, 1994). The evidence base provides a solid consensus for each sub type in both boys and girls (Moffit, et al., 2008). For a diagnosis of C/O the presence of conduct problems and at least one diagnostic criterion must have been present before the age of 10. Alternatively, an A/O diagnosis can only be given when there have been no diagnostic criteria present prior to the age of 10. Although the DSM specifies this cut off point, studies have used ages of up to 12 years to distinguish antisocial youth with divergent patterns of aggressive behaviour (Nock, Kazdin, Hiripi, & Kessler, 2006). In terms of prognosis, the prospect for A/O is far more optimistic as they are often less psychologically disturbed than those with early childhood histories of CPs.
(Salekin, Worley, & Grimes, 2010). In contrast, C/O left unattended has a chronic trajectory of antisocial and offending behaviour that extends from childhood into adolescence and then adulthood. The term ‘life course persistent’ (LCP) is often applied to this sub group of C/O CD, as it is estimated that in excess of 50% could develop into Antisocial Personality Disorder (APD) (Salekin, Worley, & Grimes, 2010; Moffit, 2006; Beuhring, 2003; Loeber, Farrington, & Petechuk, 2003; Esperito et al., 2001; Krohn et al., 2001). Thus, it is crucial that this particular pathway is not obscured in research because it is thought to be the single best predictor of who will become a serious, violent and chronic offender.

Characteristically, this C/O group is distinguished by more aggression, greater impulsivity, increased cognitive and neuropsychological dysfunction, greater social alienation, and more chaotic family backgrounds than those in the A/O group (Frick, 2003; Moffit, 1993; Moffit, Caspi, Dickson, Silva, & Stanton, 1996). It is also suggested that the C/O group has more dispositional disturbance as a consequence of transactional processes occurring between the child’s temperament and their experience of a sub-optimal childhood (Frick, 2003; Moffitt, 1993). In contrast, youth in the A/O group show fewer disturbances in neuropsychological functioning and psychosocial hardship, while still displaying a severe pattern of antisocial behaviour.

**Heterogeneity and a two path model**

As a group therefore, antisocial adolescents are significantly more diverse than children because they are likely to contain both those with an adolescent onset to their CD, as well as those who show a childhood-onset pattern (Moffit, 1993; Silverthorn & Frick, 1999). Since these subgroups of antisocial youth vary in the severity and causal processes leading to their antisocial behaviour, differential treatment needs across both groups may be necessary (Frick, 2006; Moffit, 1993).
For example, due to the chronic nature of C/O as well as the dispositional factors involved, a combination of socio-ecological treatment (interventions that consider youth their social and environmental context, taking into account factors such as family stressors, negative peer influence, substance abuse, and school difficulties) and individualized treatment may be necessary. In contrast, because of the more recent onset of antisocial behaviour in A/O, and less psychological disturbance, a socio-ecological approach is often sufficient (Salekin, Worley, & Grimes, 2010; Moffit et al., 2008). Clearly therefore, the aggregation of individuals with both subtypes of antisocial behaviour in treatment is not optimal as this can obscure group differences and unnecessarily increase the heterogeneity of the antisocial group.

In recognition of the important distinction within CD between the C/O and A/O groups, every successive DSM since the publication of the DSM IV (APA, 1997) has included these two diagnostic subtypes. Having different developmental pathways and causes for their behaviour, the practice of sub-typing on the basis of age of onset is prescribed as it captures important information about presenting problems, developmental course and prognosis (Frick et al., 2003; Moffitt, 2003, 2006).

Accordingly, it is crucial that clinicians and treatment programs clearly distinguish between C/O and A/O antisocial behaviour when assessing and treating antisocial adolescents as they require different intervention goals and approaches (Fairchild, van Goozen, Calder, & Goodyer, 2013; Howell & Hawkins, 1998; Scott & Grisso, 1997). Also, from a clinical perspective, the task of making a differential diagnosis between A/O and C/O CD can serve a triaging function by identifying those C/O adolescents who are already persistent and well on the way to a pathological adult prognosis (Odgers et al., 2007).
**Heterogeneity and a three path model**

The practice of sub-typing may now be even more critical in the light of recent research identifying a further subgroup of antisocial youth who have limited prosocial emotions including high levels of callous and unemotional (CU) traits (deficient empathy, lack of remorse, and low emotionality) and distinct temperamental characteristics. These youth are typically associated with the childhood-onset trajectory (Frick, Ray, Thornton and Kahn, 2014; Hoge, Guerra, & Boxer, 2008; Moffitt et al., 2008; Silverthorn et al., 2001), and appear to show a more severe, stable, and aggressive pattern of antisocial behavior (Frick & White, 2008; Leistico, Salekin, DeCoste, & Rogers, 2008; Edens, Campbell, & Weir, 2007; Frick, 2006; Frick & Morris, 2004).

Within samples of adolescents involved in the juvenile justice system, CU traits designate a distinctly more aggressive and violent group who initiate their delinquency at an earlier age (Kruh, Frick, & Clements, 2005; Lawing, Frick, & Cruise, 2010; Silverthorn, Frick, & Reynolds, 2001), and are at increased risk for future offending, even after controlling for the early age at which serious conduct problems began (Loeber et al., 2005).

A review of 105 studies found elevated CU traits to be consistently associated with antisocial behaviour (Frick, Ray, Thornton and Kahn, 2014). For example, Byrd, Loeber, and Pardini (2012) found that parent reported CU traits at aged 7 predicted criminal behaviour at aged 25 among a large sample of boys (503) even when controlling for childhood ODD, CD, and ADHD. Also, Kahn et al, (2012) analysed data from community (N= 1,136) and clinic (N =566) referrals for conduct problems (CPs) and found those individuals who met the CU specifier criteria had more severe behaviour, especially in aggression and cruelty. Finally, McMahon et al, (2010)
showed that CD diagnosis in combination with elevated CU traits has greater predictive power for adult antisocial outcomes than CD alone.

Several studies have also shown that adolescent offenders with CU traits show poorer response to typical treatment programs (Falkenbach, Poythress, & Heide, 2003; Gretton, McBride, Hare, O’Shaughnessy, & Kumka, 2001; O’Neill, Lidz, & Heilbrun, 2003; Spain, Douglas, Poythress, & Epstein, 2004). For example, O’Neill et al. (2003) reported that CU traits were positively correlated with greater attrition rates, poorer quality participation, increased substance abuse, and decreased overall clinical improvement in adolescent juvenile offenders. Similar results have been reported in younger samples, with children who show CU traits responding more poorly to many types of behavioral intervention than other children with conduct problems (Hawes & Dadds, 2005; Waschbusch, Carrey, Willoughby, King, & Andrade, 2007).

Thus, evidence now supports a further distinction within the childhood onset sub-group who show elevated callous unemotional (CU) traits; they have a distinct neurological profile, and are associated with more deviant and higher risk antisocial behaviour than CD youth without callous-unemotional traits (Frick, Ray, Thornton and Kahn, 2014).

This distinction has recently been endorsed by the inclusion of a specifier for limited prosocial emotions (CU traits) in the DSM 5 (APA, 2013), suggesting that delineating youth who display significant levels of CU traits will enhance the diagnostic criteria for CD. The addition of the specifier provides for a further disaggregation of adolescents with CD allowing clinicians to more precisely identify and diagnose individuals who require more intensive and individualized treatment (Frick, 2009). Feasibly, this would occur by first making a distinction between the well-established pathways of childhood-onset and adolescent-onset. After this, a determination
of the extent to which the child or adolescent displays CU traits is also crucial. Practice such as this facilitates an understanding of the differing developmental pathways and helps to inform more accurate assessment and subsequent treatment (McMahon & Frick, 2005; Frick, 1998; 2001).

In sum, findings suggest that among antisocial youth there is a sub-group who have a childhood onset (C/O) to their conduct disorder and show a higher rate of violence and aggression than those who commence their antisocial behaviour in adolescence (A/O). The recognition of these two distinct pathways contributing to the emergence of CD has been popular since the publication of the DSM-IV (1994). More recently, research has uncovered a further pathway within the C/O subgroup that displays elevated levels of CU traits. Although, both subgroups of C/O CD have multiple risk factors, the type of risk tends to differ, suggesting different causal mechanisms for their antisocial behaviour (Boxer, & Frick, 2007). For this reason, the latest publication of the DSM 5 (APA, 2013) has included a further diagnostic specifier for CU traits, suggesting a possible three path developmental trajectory for the etiology of CD in adolescence.

Pathways within Childhood Onset
There is evidence that the subgroup of youth with limited prosocial emotions (CU traits) exhibits a distinct temperamental style that is different from other youth with C/O CD (Frick & Morris, 2004). These adolescents with high CU traits tend to prefer novel and dangerous activities (Pardini, 2006), are less reactive to threatening and distressing stimuli (unlike the emotionally over reactive temperaments of other children with childhood-onset CD), and less sensitive to cues of punishment, particularly when a reward-oriented response set has been primed (Fisher &Blair, 1998; Frick et al., 2003; Pardini, Lochman, & Frick, 2003; Blair. 1999; Frick, Cornell, Bodin et al., 2003; Loney et al., 2003). Additionally, they are less distressed by the negative
effects of their behaviour on others, more impaired in their moral reasoning and empathic concern (Blair, 1999; Frick et al., 1999; Pardini et al., 2003), and less able to recognise fear and sadness in others (Dadds et al., 2008; Stevens, Charman, & Blair, 2001). Many of these differences are believed to be associated with a distinct genetic influence (Viding, Sebastian, Dadds, Lockwood, Cecil, De Brito, et al., 2012; Viding, Jones, Frick, Moffitt, & Plomin, 2008; Viding, Frick, & Plomin, 2007; Viding, Blair, Moffitt, & Plomin, 2005). However, the effect of hereditary factors seems to be larger in preschoolers than in school children, adolescents and adults. Pertaining to this, it is possible that genetic factors play a more important role in the initiation of the disorders in early childhood than in the maintenance of the disorders in the late childhood and adolescence when the impact of environmental factors increases (Frick, et al., 2003).

One of the most consistent findings from research is that C/O adolescents with high CU traits are associated with lower fear and less anxiety, whereas C/O youth with severe conduct problems and low levels of CU, are more positively correlated with anxiety. In a recent childhood study for example, Willoughby, Waschbusch, More, & Propper, (2011) found that five year olds (n=178) with high levels of parent reported CU and symptoms of oppositional defiance disorder (ODD) were rated as showing less negative reactivity to the still-face paradigm compared to those with ODD symptoms and low levels of CU traits (Frick, Ray, Thornton and Kahn, 2014).

Associated with this, and perhaps most relevant to the purpose of this study, Frick, Cornell, Barry, Bodin, and Dane (2003) found that C/O youth with high CU traits were more likely to have low emotionality and display high levels of proactive aggression (i.e., aggression that is used for influence and dominance), (Crick &Dodge, 1996; Dodge, Lochman, Harnish, Bates, &Pettit, 1997) whereas, violent and aggressive youth with low CU traits tend to have more
difficulty with emotional and behavioural regulation due to being emotionally over-reactive.

These disparities in emotional regulation are believed to be critical in understanding the different causes of their aggression and behavioral problems (Frick & White, 2008; Mc Mahon & Frick, 2005; Kimonis et al., 2006; Frick & Morris, 2004).

The theoretical developmental model that perhaps best explains the differences in the aggression of this high risk group of youth is based on social cognitive information processing (SCIP) (Boxer & Frick, 2007). The model suggests that behavioural response patterns are represented by cognitive scripts that fall into 3 categories:

First, in the way youth attribute causes of events: It is posited that C/O CD youth who do not exhibit CU traits have a hostile attribution style. In social situations for example, they misattribute ambiguous cues as being hostile. Consequently, their anxiety heightens, they become angry and defensive, and then react aggressively. This reactive form of aggression that betrays problems with emotional regulation has primarily been observed in C/O youth with low CU traits (Nas, Orobio de Castro, & Koops, 2005). Second, the way youth select their behavioural responses: In accord with learning theory, children who become violent offenders have repeatedly been reinforced for employing aggression and violence as social problem solving strategies. An example of this is children who have been subjected to antisocial and violent role modeling in the home environment, or have been subjected to chronic domestic violence. Third, in the way youth interpret the consequences of their behaviour: In this regard, it is only those youth high in CU traits who emphasise the positive outcomes of aggressive responses and minimise the potential harmful consequences of their behaviours (Pardini et al, 2003). For example, intimidating and threatening others may result in a position of dominance,
the boosting of their status in the social group, and the attainment of money or material possessions.

Thus the SCIP model shows that youth who engage in aggressive and violent behaviours differ in their capacity to regulate their emotions (Crick & Dodge, 1994; Dodge, 2006). In addition, the distinguishing characteristics of these two violent sub-groups, underscores the necessity for distinct treatment needs between the two groups of C/O youth. Essentially, the reactive aggressors have problems interpreting attribution, whereas the proactive aggressors have difficulty with interpreting consequences.

Assessment and Implications for Intervention

Since there are multiple developmental pathways leading to CD, it is crucial that assessment is used to determine which of these pathways best describes the youth who is displaying antisocial and aggressive behaviour (Frick, 2009). For example, behavioural symptoms in a young person who has low levels of CU traits but whose serious conduct problems began prior to adolescence may include; difficulties with emotional regulation, higher levels of anxiety, depression, anger, misattribution of hostile intent, and verbal deficits. In contrast, adolescents with C/O CD who display high levels of CU traits are more likely to show a lack of sensitivity to punishment, low emotionality, the failure to experience guilt and empathy, a preference for dangerous and novel activities, and the presence of instrumental aggression. Clearly both groups of young people are at serious risk for antisocial outcomes, and need to be targeted for specific intervention. Therefore, delineating between these subtypes of conduct disorder will allow for treatments that can be tailored to the unique needs of the individual, rather than attempting to treat them as a homogenous group (Frick, Ray, Thornton and Kahn, 2014).
For this reason, a ‘one size fits all’ treatment approach can be problematic because the cognitive and emotional characteristics of high risk offenders present unique challenges to the effectiveness of treatment that have important implications for intervention. Primarily, treatment needs to be comprehensive and address all the risk factors in order to be effective. Crucially also, treatment needs to be individualised to the degree that unique causal and maintaining factors are addressed across groups (Frick, Ray, Thornton and Kahn, 2014).

Most of the evidence-based interventions that are specified for CD such as Behavioural Parent Training, Functional Family Therapy (FFT) and Multi-Systemic Therapy (MST) focus on parenting skills and the social ecology of the child or young person (Scheepers, Buitelaar, & Matthys, 2011). These interventions have evidence of being generally effective, since environmental factors play a major role in the development and maintenance of CD without CU traits (Henggler & Sheidow, 2012). However, in youth with CD and CU traits, which is associated with a distinct genetic influence, focusing on the temperamental aspects in the young person allows for a more direct approach in targeting the processes operating for these youth. For example, interventions designed to enhance empathic responding, or those that capitalize on a reward-oriented response style seem to be more effective for this group (Frick, et al., 2003).

Few studies have so far addressed the treatment of adolescents with CD and CU traits. The relevant ones that have done so will be evaluated in the body of this review. However, a number of childhood treatments have demonstrated positive outcomes that could be useful in informing adolescent interventions.

Hawes and Dadds (2005) found that the effects of parent training on boys (N= 56; aged 4-9 yrs) referred to the clinic for CPs, were moderated by those with CU traits. Specifically, the study
found that CU traits had less overall positive response to treatments that focused on teaching parents more effective discipline strategies. However, one particular aspect of intervention that focused on teaching parents positive reinforcement was equally successful for the CD group with CU traits.

Dadds et al, (2012) randomly allocated boys (6-16) to a parenting intervention (N=100), or an emotional recognition training group (N=87). Children with elevated CU showed a poor response to Parent Training in terms of change in CPs. However, children with high CU traits who were trained in accurate perception and interpretation of other’s emotions showed greater improvement in empathy. Therefore, as in Hawes and Dadds (2005) the individualized aspect of treatment for those with CU traits and CPs that targeted crucial aspects of child temperament (perspective taking, accurate perception and interpretation of other emotions) was successful. These studies strongly suggest the importance of taking into account the punishment insensitive behaviour patterns of children with CPs and high CU traits. Clearly, the treatment process important for the effectiveness of regular parenting interventions may be confounded when applied to those with elevated CU traits, and therefore needs to be adapted for this group.

Frick and White (2008) reported that preschool children with high levels of CU traits showed enhanced conscience development if they experienced consistent discipline and a parenting style that emphasized a strong and obedience-oriented (i.e., authoritarian) approach to parenting. These authors suggested that the under-arousal exhibited by fearless children may require parents to incorporate stronger methods of socialization that bring arousal levels to an optimal range in order for the child to internalize parental norms for prosocial behavior (Frick & White, 2008).
Similarly, children with this temperamental style may also develop appropriate levels of guilt and empathy if they experience certain corrective environments. For example, in a study of 87 preschool children selected according to their temperaments, those with a temperamental style that placed them at risk for problems in the development of empathy and guilt showed normal levels of conscience, if they experienced consistent and strong, rule-oriented parenting (Frick, 2009).

Perhaps it is also the intensity of treatment that can make a difference for these children. Somech & Elizur (2012) randomly allocated children aged 3-5 years with elevated CU traits to what we shall call a ‘super treatment’ (additional Parent Training of 14 x 2 hour sessions focusing on parent and child self regulation), and a regular Parent Training intervention. The outcome was a significant decline in CU traits relative to the regular condition, that was maintained to one year follow up.

Other important studies showing positive outcomes for children include (McDonald, Dodson, Rosenfield, & Jouriles, 2011; Kolko & Pardini, 2010; Waschbusch, Carrey, Willoughby, King, & Andrade, 2007). Taken together, the above studies provide hope by suggesting that those with CU traits can have a positive response to intervention if they are identified and treated early in their development. Crucially also, the CPs of those children with high CU traits were less responsive to traditional parenting practices than those with low CU traits. Essentially, conventional Parent Training was ineffective for the CU group. Treatments needed to be modified and individualized by integrating child temperament with social learning principles. Reward focused behaviour approaches for example, appeared to demonstrate most promise for maximum treatment gains in children with CU traits. In addition, treatments that included longer
term, more consistent, rule oriented approaches seemed to be quite effective in helping these children to internalize societal norms (Frick, 2009).

So then, if childhood treatment approaches are having even a degree of success, could not adolescents with CU traits who are positioned at far greater risk of adult pathology, also benefit? Even if they require stronger doses and for longer periods (‘super treatments’)? Crucially, treatment for the two violent sub groups of C/O CD will also require socio-cognitive remediation that addresses reactive aggression for those with normative CU traits, and pro-active aggression for those with elevated CU traits (Niranjan, Karnik & Steiner, 2007).

In sum, antisocial adolescents vary greatly in the severity and causes of their antisocial behaviour. The personality profiles of C/O CD are more extreme than A/O and incorporate a third subgroup of CD youth who have elevated levels of CU traits and a stronger genetic contribution to their pathology that demands a differential approach in terms of treatment. Accordingly, the DSM 5 (APA, 2013), informed by the developmental theory of CD prescribes sub-typing according to age of onset as well as specifying for CU traits, as this captures information about presentation, developmental course, prognosis, and treatment needs. Prior to the inclusion of the CU traits specifier, the DSM IV (APA, 1994) and DSM IV-TR (APA, 2000) only recognised a two path process in the development of CD, namely C/O and A/O. Now, with the publication of the DSM 5 (APA, 2013), a third pathway for the development of CD is suggested among those who have childhood onset to their CPs alongside elevated CU traits.

Aims and Purpose

On the basis of the supporting literature and the DSM’s recognition of these developmental pathways, it is the intention of the present review to investigate the top three evidenced based
treatments of CD in adolescents, in order to help inform a model of treatment. These three treatment modalities are Multi-systemic Therapy, (MST), Functional Family Therapy (FFT), and Multidimensional Treatment Foster Care (MTFC). The specific research questions that will be applied are: i) Is the subject treatment more effective than a comparison treatment for adolescents with CD when implemented on a disaggregated group? (ii) Do treatments work better when adopting a two pathway model and differentiating between those with adolescent onset (A/O) and those with untreated childhood onset (C/O) to inform treatment? (iii) Coinciding with the recent addition of specifiers in the DSM 5 (APA, 2013) which effectively designate a further subgroup of individuals with CU traits, are treatments beginning to follow a three pathway model by sub-typing between C/O and A/O and then further differentiating those with the presence of CU traits?

The answers to these questions will determine whether the practice of sub-typing CD is routinely being utilised by the prominent evidence based treatment modalities in order to inform treatment. Essentially, this will elucidate whether they have been following a one size fits all approach or a two pathway approach in the assessment process. Crucially also, the review questions may help to inform whether these treatment modalities are adequately positioned to be effective in their future interventions given the recognition of what amounts to be a third pathway for those with CU traits?

**Method**

An extensive search was conducted to identify studies undertaken by the most notable evidenced based programs treating CD in adolescence in order to ascertain whether the theoretical premise for best practice assessment and treatment was being utilised. The programs identified were Multi-Systemic Therapy (MST), Functional Family Therapy (FFT), and Multidimensional
Treatment Foster Care (MTFC). The electronic data bases PsycInfo, Science Direct, Proquest, Psychology and Behavioural Sciences Collection, Blackwell, and PubMed were searched using key words: Multi-Systemic Therapy or MST, Functional Family Therapy or FFT, and Multidimensional Treatment Foster Care or MTFC, Conduct disorder (CD), Subtyping CD, Subtypes of CD, treatment of CD, and treatment of subtypes of CD. In addition, bibliographic lists of all selected articles were searched for further references.

Only studies published or accepted for publication after 1993 were included. The rationale for this inclusion criterion is because the theory informing the DSM-IV (1994) was not sufficiently developed or accepted prior to 1993. Additionally, although an understanding of the common co-morbid problems such as ADHD, anxiety disorders, depression, and learning difficulties has important implications in the treatment of adolescents with conduct problems (CPs), for the purpose of the present review studies were restricted to adolescents with CD and the different pathways through which they develop these behaviors.

The current review was conducted according to the PICOT model outlined below:

*Population* - Adolescents presenting with Conduct Disorder

*Intervention* - MST, FFT, MTFC

*Comparison* – Generic treatment as a homogenous group versus treating according to a two and three path model of CD etiology

*Outcome* – A developmental pathway approach to assessment and treatment as inferred by the DSM 5 is suggested in order to ensure that those who have missed out on appropriate childhood treatment do not fail to receive targeted intervention in their adolescence.
Review of Adolescent Treatments

Introduction

The literature advocates that treatment is necessary for every presentation of CD. In childhood, intervention should commence as close to symptom appearance as possible, with the goal being the limitation of C/O CD to childhood. In adolescence, the goal of intervention is to restrict the antisocial behaviour from continuing into adulthood (Loeber, Farrington, & Petechuk, 2003).

In childhood, the treatment is best delivered by subdividing the population into levels of risk towards becoming life course persistent (LCP). The general attitude of childhood treatments is that CPs continuing into adolescence is an indication of failure to intervene or failure of treatment. In addition, there is a general awareness that a critical window exists in which to treat using primary and secondary interventions that are based on multiple risk factors and implemented in multimodal ways to address the most pertinent risk domains (Ferguson, 2005; Beuring, 2003, Esperito, et al., 2001).

C/O CD that does continue into adolescence is positioned to be at far greater risk of adult pathology due to absence of treatment, or inadequate treatment in childhood. At this point, the behaviours and personality are becoming more obdurate and less malleable to remediation. Thus, with the risk towards becoming Antisocial Personality Disorder (APD) now far greater, subdivision into levels of risk is imperative for effective treatment. This involves reducing the heterogeneity by the subdivision of C/O and A/O (two pathway approach), followed by partitioning between those with elevated CU traits (three pathway approach), which, based on the theory will typically be limited to C/O group (Frick, et al., 2003; Frick, 2009).
The three programs at the top of most lists of proven treatments for conduct disordered adolescent offenders are Multi-systemic Therapy, (MST), Functional Family Therapy (FFT), and Multidimensional Treatment Foster Care (MTFC).

In a review of more than 500 programs designed to treat and prevent youth conduct problems, the Blueprints for Violence Prevention report found only three that met the stringent criteria for effectiveness in reducing criminal behaviour in adolescents (Manders et al., 2013; Gustle, et al., 2007). The three programs identified were FFT, MST and MTFC, all family-based ecological models. A large proportion of their studies deal with offending youth in juvenile justice populations, possibly because they provide a rich source of participants in community settings. Typically also, the base rates of CD amongst this population are in excess 75% (Fazel, Doll, & Langstrom, 2008).

Findings suggest that these more intensive, multi-modal interventions which incorporate the family and the young person and target both risk and protective factors in the ecology have more significant and enduring treatment effects (Kazdin, 2005). Moreover, each treatment modality is reputed to be both comprehensive, and individualized.

The following table provides an overview of the three treatment programs including their target behaviours, theoretical approach, and level of intensity.
Table 1. Overview of the three model programs.

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<td>Intensity/Duration</td>
<td>10 to 12 sessions, over 3 to 4 months</td>
<td>60 hrs over 3 to 5 months</td>
<td>24-hour/7 day a week, over 9-12 months</td>
</tr>
<tr>
<td>Location</td>
<td>Home-based</td>
<td>Home-based</td>
<td>Youth in foster care</td>
</tr>
<tr>
<td>Caseload</td>
<td>12 to 16 families per fulltime therapist</td>
<td>4 to 6 families per full-time therapist</td>
<td>10 cases per treatment team</td>
</tr>
</tbody>
</table>

FFT, Functional Family Therapy; MST, Multisystemic Therapy; MTFC, Multidimensional Treatment Foster Care.

Multi Systemic Therapy (MST)

MST is reputed to be an excellent evidenced based intervention for juvenile offenders and youth with serious emotional and behavioural disturbances. Such interventions are based on family systems theory (Hayley, 1996) and social-ecological theory (Bronfenbrenner, 1979) which highlight the importance of tailoring intervention towards the young person’s and the family’s systems such as peers, school and community.

Consistent with research on the development of conduct problems, antisocial behavior is viewed as multi-determined, with relevant factors being present at the individual (e.g., cognitive biases), family (e.g., communication and relationship dynamics), peer (e.g., positive versus negative nature of associations), school (e.g., learning and involvement ), and community (e.g., availability of pro-social activities for youth; antisocial influences) levels (Henggler & Sheidow, 2012).
General Effectiveness of the Model

The evidence base for MST is robust, having more Randomised Controlled Trials (RCT) than the majority of social interventions. MST trials have also been included in systematic reviews of a variety of interventions for youth presenting with serious antisocial behaviours (Woolfenden, 2004). Some have suggested that MST is one of the most positively effective empirically based treatments for severe youth conduct problems (Lyons & Rawal, 2005; Rosenblatt & Woodbridge, 2003). Further, Curtis (2004) reported the results of a systematic review on the effectiveness of MST and concluded that it was the treatment of choice for CD and concomitant antisocial behaviour.

Limitations of the Model

More recently however, a review by the Cochrane Collaboration (Littell, Campbell, Green, & Toews, 2009) did not find MST significantly superior to other services, and it questioned the well established view that MST is superior to standard treatments for antisocial behaviour. The review found methodology issues in MST research such as publication bias (exclusion of unpublished studies and independent research), allegiance effects, and estimation bias, and perhaps most salient to this review, the inference of pre-treatment heterogeneity.

Specifically, the report argued that the short term nature of MST (4-6 months) placed limits to what can be achieved no matter how well designed the interventions. The authors suggested that in order to achieve lasting improvements in youth and family, more robust, longer term interventions, allied with more consistent and coordinated support from other services including therapeutic support were needed. Their point serves to underscore the important distinctions between CD sub groups requiring differing intensities and duration of treatment. In this respect,
perhaps the authors were advising that in its present state MST may be better suited to the A/O population as opposed to an intensive, longer term, more individualized treatment required for those with more complex presentations of CD such as those with CU traits.

The following table provides a summary of the MST studies and results included in this review.

For the purpose of this study, the results include general outcomes of treatment as well as the findings of this review that are relevant to the research questions pertaining to the DSM 5 inferred pathway approach to assessment and treatment of CD in adolescents

**Table 2. Summary of results for MST**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Method</th>
<th>Summary of Results</th>
</tr>
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<tbody>
<tr>
<td><strong>MST</strong></td>
<td>N=64; Age = 8-17 yrs</td>
<td>MST assessment and treatment protocol: Family based, using systemic strengths as levers for change in youth ecology</td>
<td>Significant decrease in severity of offences from pre-treatment to 1 year post treatment. Sample spanned a large age range but no attempt to reduce heterogeneity by sub-typing of CD (potentially 5 subgroups represented in sample). No data on how different ages responded to treatment.</td>
</tr>
<tr>
<td>Curtis, Ronan, &amp; Crellin, 2009</td>
<td>Juvenile offenders Diverse diagnosis including ADHD, ODD, CD, Mood and Learning disorders</td>
<td></td>
<td>No advantage over TAU and results did not improve at 2 years follow up. Authors acknowledged different sub-groups but did not attempt to subtype. Failure to subtype led to unmatched conditions - Early onset higher in TAU (64%) than in MST condition (42%)</td>
</tr>
<tr>
<td><strong>MST (RCT) compared with usual welfare services</strong></td>
<td>N=156; Age = 12-17 yrs</td>
<td><em>Specifically targeted Conduct Disorder</em> CBCL, YSR, Sense of Coherence Scale (SOC), Self Report Delinquency Scale (SRD)</td>
<td>No lasting treatment differences. Any positive outcomes dissipated by 12 months post treatment. Researchers conceded that due to the complexity of behaviours, a time limited intervention was insufficient. No provision made for reducing pretreatment heterogeneity (despite a similar age range to</td>
</tr>
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</table>
Curtis and colleagues (2009), and 5 potential subgroups of CD present in treatment

<table>
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<tr>
<th>MST (RCT)</th>
<th>N= 31; Age =9-17 Offending youth with complex behaviours and diversity of presentation: CD (39%) Bipolar (32%) ADHD (23%) Dysthymia (16%) Depression (13%) PTSD (10%)</th>
<th>CBCL, Youth Risk Behaviour Survey (YRBS)</th>
<th>Compared with US, MST had a moderate effect on minor offences but not index offences, and did not result in a reduction of arrests. Caregiver report did not agree with youth on reductions in externalizing and internalizing symptoms. Extreme diversity of age range and presentation but no indication of tailoring treatment to individual needs. Particular to CD, by not accounting for sub-types, the more severe C/O participants may have obscured a potentially stronger effect for A/O</th>
</tr>
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<tbody>
<tr>
<td>MST program evaluation compared with ACE triaging risk model (Beuhring, 2002)</td>
<td>High risk young offenders between 6 – 9 years old</td>
<td>ACE risk assessment measure based on severity of childhood risk factors</td>
<td>Due to short term nature MST deemed inappropriate for this high risk group of young offenders. However, it held promise for the lesser risk young offenders requiring short-term interventions in the community.</td>
</tr>
<tr>
<td>MST (RCT) Butler, Baruch, Hickey, &amp; Fonargy (2011)</td>
<td>Offending youth N=108; Age = 13-17 MST compared with English Justice System YOT teams</td>
<td>CBCL, YSR, ABAS, APSD</td>
<td>Offending in both conditions decreased at 6 months post treatment. MST reduced the likelihood of non-violent offending at 18 months post treatment. No differences found in rates of violent offending. Parental ratings of CU traits were reduced more in the MST condition but this was not corroborated by youth report. Despite the acknowledgement of significant diversity, no provision was made to parse heterogeneity by sub-typing according to age of onset. Also, no indication of tailoring treatments to the CU cohort in accord with their proactive aggression and punishment insensitivity. The study was not truly representative of high risk youth with CU traits as there were few violent and chronic offenders in the sample.</td>
</tr>
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</table>
MST

(RCT)
Manders, Dekovic, Vander Lahn, & Prins, (2013)

Youth with severe conduct problems
N= 256; Age = 12-18. TAU (109), MST (147)

CBCL, YSR, APSD, ICU

MST had no advantage over TAU in reducing externalizing problems. CU traits and narcissism moderated the effect of treatment on externalizing problems. MST was more effective in reducing externalizing problems of lower CU traits and lower narcissism group. MST was ineffective in treating those in the high CU traits and high Narcissism group.

MST Broad-Spectrum Approach to Treatment

In practice, it appears that few MST studies have specifically targeted conduct disorder, and those that have attempted to do so, achieved limited success. In the Sundell et al., (2008) comparison of MST to usual child welfare services, for example, MST had no advantage. At study intake, 67% of the young people had been arrested at least once, and 32% had been in out of home placements in the previous six months (Lofholm, Olsson, Sundell, & Hansson, 2009). After seven months, youth in both conditions had reductions in self-reported externalising behaviours, but not their self-reported internalising symptoms. A follow up study to investigate the treatment outcomes at 24 months post treatment showed the previously reported results had not improved (Löfholm, Olsson, Sundell & Hansson, 2009). In short, the results did not support the long-term effectiveness of MST relative to the services usually available for conduct-disordered young people in Sweden.

The authors conceded that site effects, program fidelity, and program maturity could not explain the lack of significant between group differences. A more feasible explanation however appears to have been a moderator not frequently identified either by MST or other programs. Namely, the unmatched distribution of subgroups within the two conditions... “The average number of young
people with an early onset of behaviour problems (before the age of 13) was, according to the
caregiver, higher in the TAU group (64%) than in the MST group (42%)” (Löfholm, Olsson,
Sundell & Hansson, 2009, p. 383). Crucially, by not giving sufficient attention to the theoretical
underpinnings of CD assessment and following a dual pathway approach for example, the study
failed to address the disparities evident in the two treatment conditions. Overall therefore, the
study demonstrates the application of a single pathway approach to CD development and
treatment.

Curtis and colleagues had more general success in their treatment of juvenile offenders (N =64)
in New Zealand, where the severity of offences from pretreatment to one year post treatment
significantly decreased. Notable in this study was the vast age range (8 to 17 years), as well as a
variety of primary diagnosis including CD, ADHD, ODD, mood disorders and learning disorders
(Curtis, Ronan, Helblum, & Crellin, 2009).

Without diminishing the importance of the treatment effects for participants as a whole, the study
did not attend to the reduction of pre-treatment heterogeneity within this conduct disordered
cohort. For example, despite the diversity of symptom presentation and an age range extending
from childhood to late adolescence, there was no indication of any attempt to disaggregate CD
by sub-typing in accord with theoretically informed clinical practice. This confirms the
likelihood that treatment was administered from the perspective of a single pathway approach to
the development of CD rather than a multiple pathway process. Due to the age range of the
treatment cohort (8-17 years), for example, the treatment potentially included at least 4 distinct
subgroups of CD within the one condition (even without specifying those with elevated CU
traits): Two sub types from those children aged 8-10 years with childhood onset (‘childhood

29
limited’ and ‘life course persistent (LCP)’); and two subtypes among the adolescents (‘childhood onset’ (LCP), and ‘adolescent onset’). Thus, a ‘one size fits all’ approach may have obscured differences in treatment effects between the groups. In this case, a breakdown of the ages of these children as well as the treatment effects between early and late onset CD symptoms may have provided some very useful data.

In a similar generic approach to treatment, MST was compared with inpatient treatment followed by usual services for emotionally disturbed youth. 156 youth (aged 10 to 17 years) participated in the RCT, and the varied diagnoses included ODD (51%), CD (16%), and major depression (27%) (Johnson & Waller, 2006; Henggeler et al., 2003).

MST failed to demonstrate any lasting treatment differences, and the few positive outcomes that were achieved, dissipated by 12 months post-treatment. The researchers conceded that because of the chronic nature and complexity of problems experienced by the participants, a time limited intervention was not adequate (the exact contention raised by the Cochrane Collaboration, 2009).

In addition, despite the extensive assessment measures used in this study, including the CBCL and YSR (Achenbach, 1991a,b), no provision was made for reducing the pre-treatment heterogeneity of CD presentation. In similar fashion to Curtis et al., (2009), the participants were treated as one homogenous group despite an age range extending from 10 to 17 years and the likelihood of multiple subgroups represented within this cohort.

**Broad Spectrum MST versus a Triaging Approach**

One particular study conducted by a research team from Ramsey County, Minnesota highlighted the need for the disaggregation of CD prior to treatment (Beuhring, 2002). The team was
commissioned to evaluate and find the most efficacious interventions for childhood onset high risk young offenders who were between six and nine years old. MST was trialled because of its strong evidence base, as well as being the national model for treating chronic adolescent offenders. The results found that MST was ineffective as a stand-alone intervention. The study team’s rationale for discontinuing with MST included the following:

i) Time constraints - MST focuses on identifying and removing immediate triggers to problem behavior, not on addressing chronic problems that play an important but indirect role, such as a volatile temperament, pervasive neglect, or disrupted attachment.

ii) MST’s success with violent and chronic juvenile delinquents was deemed to be modest at best, because although they had achieved reductions in offending compared to standard interventions, MST rates of re-offending were still elevated. Consequently, it was determined that the high risk young offenders in this Minnesota study would not readily benefit from MST’s intensive short-term intervention.

The research concluded that MST would not be appropriate as a separate intervention for high risk young offenders. However, it held promise for the lesser risk young offenders requiring short-term interventions in the community (Beuhring, 2002). Instead of MST, ACE (All Children Excel) was chosen because of the way it allocated treatment to the highest severity of risk. Essentially, despite being a pre-adolescent treatment, the ACE model triages the children on a series of risk domains (including age of onset of offending), separates them into groups ranging from lowest risk to highest risk, and then allocates resources, treatment intensity, and duration on
this basis. Thus, in contrast to MST, the ACE model demonstrates attention to a pathway type approach in assessment and subsequent allocation for treatment.

Modest outcomes in the Rowland et al., (2005) study with Hawaiian youth lend support to Beuhring’s (2002) contention that MST may be more effective in treating less severe cases of CD and antisocial behaviour. The youth in this study were at risk of out-of-home placement due to serious emotional disturbances including high rates of externalizing and internalizing symptoms. The results showed that relative to usual services (US), MST effects were moderately effective for minor offense arrests, had no effect for index offenses, and did not result in a significant reduction in arrests. Although MST youth reported significantly greater decreases in CBCL (Achenbach, 1991a) externalizing and internalizing symptoms than US counterparts, caregiver reports for MST effects on youth symptoms did not corroborate with youth self-reports. Thus, an absence of treatment effects for index offences and inconsistent reports between caregivers and youth on the moderation of externalizing and internalizing behaviours suggest that MST may be less effective with more severe presentations of CD (possibly C/O low CU, and C/O high CU).

A plausible explanation for this may be that the results were obscured by the conspicuous pre-treatment heterogeneity in presentation and in age range (see results table). By not accounting for CD subtypes and their individual treatment requirements within the treatment condition, the more severe childhood onset participants may have suppressed a potentially stronger effect for the adolescent onset participants. The diversity of presentation in this study highlights the MST
tendency to use a broad spectrum (single pathway) approach to treatment despite clear differences in individual treatment requirements within this troubled cohort.

*MST Attempts to Disaggregate on the Basis of CU traits – Application to the Third pathway?*

Butler, Baruch, Hickey, & Fonargy, (2011) compared MST with the English youth justice system’s Youth Offending Team (YOT). Youth (13-17 years) were randomly allocated to MST (56) or YOT (52) conditions.

Although, this study attempted to condense the heterogeneity of CD by looking at the amenability of CU traits to MST treatment, no provision was made for age of onset determination (two pathway) or differing treatment needs based on their developmental course and the theoretical underpinnings of aggression (three pathway). The authors’ did however acknowledge the differing developmental pathways for CD. This was clear in their introduction to the study when they discussed the differing CD groups and how childhood onset persisting into adolescence is the most serious:

> Of juveniles with diagnosable conduct disorder (CD), more than three-fifths have severe problems: 29% have pervasive CD with an average of 8 symptoms including aggression; a further 29% endorse on average six symptoms including theft and other property oriented offenses (but not physical violence); and 3% appear to be primarily aggressive. Most serious youth antisocial behavior is committed by a very small group of persistent offenders (Butler, Baruch, Hickey, & Fonargy, 2011, p. 1220).

Despite the acknowledgement of significant diversity in CD including differing developmental pathways however, no provision was made for this to be identified, broken down, or investigated
in the study. Instead, it appears that MST treatment which emphases the socio ecological correlates of antisocial behaviour, was applied with basically the same intensity and duration to each group (C/O low CU, C/O high CU, and A/O) represented in the study.

One curious finding from the study showed that parental ratings of youth CU traits were reduced more in the MST condition. Pertaining to this the authors stated that their result called into question the unique biological nature of the “so called callous-unemotional trait” (Butler, Baruch, Hickey, & Fonargy, 2011, p. 1232). However, considering the youth endorsement did not agree with parental reports, this was perhaps a somewhat ambitious statement. In attempting to explain the inconsistency between parental and youth self report, the authors suggested that it is common for youth to minimise their aggressive behaviour. Extant research however, suggests otherwise. Namely, that young people with high CU traits will not fail to endorse their aggressive behaviour (Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Frick, Cornell, Barry, Bodin, & Dane, 2003). Also, this study may not have been truly representative of the high risk group with CU traits identified by research, as the participants included few chronic and violent offenders.

Perhaps most relevant to the questions under review, a RCT was conducted to ascertain whether MST is as effective for antisocial adolescents with high CU traits as it is for those with lower CU traits (Manders, Dekovic, Asscher, Van der Laan, & Prins, 2013). The study rationale for employing MST was that it purports to be both comprehensive and individualized (essential qualities for an effective treatment), and therefore may be as effective in treating adolescents with high levels of psychopathic traits as it is for adolescents with lower levels of these traits. If not, this would suggest a moderating role of psychopathic traits on MST effectiveness.
In this randomized control trial, youth (12-18 years) were assigned to MST treatment (N=147), or received treatment as usual (TAU; N=109). TAU included an array of social and mental health treatments. Assessments conducted at baseline and at post-treatment included the CBCL, and YSR (Achenbach, 1991a,b). At baseline, 75% of the adolescents had clinically elevated scores (above the 90th percentile) on externalizing problems. The constructs of narcissism and impulsiveness were assessed with the Antisocial Process Screening Device (APSD - Frick and Hare, 2001), and CU traits with the Inventory of Callous Unemotional Traits (ICU; Frick, 2004).

The results revealed MST had no advantage over TAU in reducing externalizing problems for adolescents with high levels of psychopathic features. Both CU traits and Narcissism moderated the effect of intervention on externalizing problems as rated by the parents and adolescents. MST was more effective than TAU in decreasing externalizing problems for the lower CU traits group and the lower Narcissism group, but not the high CU traits group or the high Narcissism group. Thus, the advantage of MST over TAU could not be extended to the high Psychopathic traits group. This finding adds further support to the contention that MST may be more suited to treating A/O (according to a single pathway model) than C/O low CU traits (which infers a two pathway model approach) and C/O high CU traits (which infers a three pathway model) as they require differential treatment based on their etiology and maintaining factors.

As previously described, MST is a multi-modal (comprehensive) and intensive treatment which potentially could be effective for youth with psychopathic features. The findings of this study suggest however, that in order to meet the specific needs of adolescents with high levels of CU
traits and high levels of narcissism it is important for MST to adjust and shape its interventions. Since these adolescents are particularly at risk for developing far more serious problem behavior, a different approach is considered necessary to treat these subgroups because of the distinct causal pathways leading to their problem behaviour (Frick and White 2008; Pardini and Loeber 2008; Frick et al. 2003). For example, if approached according to a three pathway model of development and treatment, lengthier interventions could be provided which include additional individualized treatment for the adolescent, tailored to their temperamental features and addressing such factors as a pro-active style of aggression, cognitive empathy skills, and reward-based parenting with less disciplinary components (Frick et al. 2003; Hawes and Dadds 2005).

This study does underscore the clinical importance of adequately assessing CU traits in adolescents referred for the treatment of antisocial behaviour, and identifying those adolescents who have elevated levels of these traits.

Functional Family Therapy (FFT)

Numerous reviews have identified Functional Family Therapy (FFT) as one of the emerging evidence-based intervention programs for at risk adolescent youth and their families (Alexander & Sexton, 2002; Sexton, Alexander, & Mease, 2003).

FFT has a strong relational focus, with the presenting problem viewed as a symptom of dysfunctional family relations. Interventions aim to establish and maintain new patterns of family behavior to replace the dysfunctional ones. FFT integrates behavioral and cognitive-behavioral interventions into treatment protocols and treatment involves an average of 12 sessions over a period of 3 to 4 months in home settings. The implementation of FFT is phase-
based, with initial emphases on engaging and motivating family members, followed by intensive individual and family behavior change, and concluding with treatment sustainability.

The following table provides a summary of the FFT studies and results included in this review.

For the purpose of this study, the results include general outcomes of treatment as well as the findings of this review that are relevant to the research questions pertaining to the DSM 5 inferred pathway approach to assessment and treatment of CD in adolescents

**Table 3. Summary of results for FFT**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Measures</th>
<th>Summary of Results</th>
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<tbody>
<tr>
<td><strong>FFT</strong></td>
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<tr>
<td>Barnowski, 2002; 2004</td>
<td>Juvenile offenders compared with treatment as usual</td>
<td>FFT- assessment of socio-ecological domains linked to FFT protocol</td>
<td>40% lower recidivism rate at 12 month follow up than TAU</td>
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<tr>
<td><strong>FFT</strong></td>
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<tr>
<td>(RCT) Sexton &amp; Turner (2010)</td>
<td>Adolescent offenders (N= 917; Age= 13-17) compared with usual probation services.</td>
<td>FFT- assessment of socio-ecological domains linked to FFT protocol TAU - Washington State Juvenile Court Risk Assessment (WAJCA-RA)</td>
<td>No differences at 12 months post treatment between FFT and TAU (which consisted of regular juvenile probation services). Arrest rates (outcome measure) were 22% in both conditions. No formal diagnosis of CD and a failure to sub-type meant that results were likely obscured by differential responses to treatment. A break down of age of onset was provided but not analysed to reduce heterogeneity, inform treatment, or assess differential treatment response.</td>
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<tr>
<td>FFT</td>
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<tr>
<td><strong>White, Frick, Lauing, &amp; Bauer, 2012.</strong></td>
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<tr>
<td>Arrested youth N=134, Age = 11-17</td>
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<tr>
<td>ICU, Behaviour Assessment Scale for Children, 2nd Ed (BASC-2)</td>
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<tr>
<td>FFT- assessment of socio-ecological domains linked to FFT protocol</td>
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<tr>
<td>Youth with CU traits showed some improvement but still ended treatment with higher levels of conduct problems and poorer adjustment post treatment than youth with normal CU traits.</td>
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<tr>
<td>CU group correlated negatively with parental and youth ratings of treatment response. CU group positively correlated with risk of violent offending during treatment.</td>
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<tr>
<td>Although the study aim was to assess differential treatment response to FFT, the mediocre results highlight the need to diagnose CD and sub type according to age of onset and CU traits, as well as tailoring treatment to their individual needs.</td>
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**General effectiveness of FFT**

Although FFT is regarded as being less intensive than MST and therefore less adept at treating adolescents with more complex behaviours (Gustle, et al., 2007), it has demonstrated some positive outcomes for adolescent CPs and juvenile offending.

In a statewide implementation of FFT for example, that was administered to 400 families through the juvenile courts, FFT had a 40% lower recidivism rate at 12 month follow-up compared with a treatment as usual control group (Barnowski, 2002; 2004). In addition, two independent evaluations of FFT have been conducted with juvenile offenders in Sweden, with outcomes favoring the FFT condition. Both of these studies however were only published in Swedish Journals and therefore unavailable in English (Hansson, Cederblad, & Hook, 2000; Hansson, Johansson, Drott-Englen, & Benderix, 2004).
FFT Broad Spectrum Approach

Like MST, FFT is depicted as a comprehensive and individualized treatment that is well positioned to treat adolescents with chronic and severe conduct problems. Pertaining to the specific targeting of CD however, FFT does not appear to carry out treatment in accord with the developmental pathways informed by the DSM. Rather, it appears that a broad spectrum treatment approach is employed (single pathway) according to the assessment of socio-ecological strengths and weaknesses in the youth’s ecology.

This is exemplified by an ambitious RCT conducted by Sexton & Turner (2010) to investigate the effectiveness of FFT in treating high-risk, behavior disordered youth in a community juvenile justice setting. The sample consisted of 917 adolescent offenders between the ages of 13 and 17 years, from 14 different counties. Not surprisingly, this study had significant heterogeneity in presentation and enormous diversity of conduct severity ranging from weapons crime and gang involvement, to absconding and truancy. At 12 month follow up, re-arrest rates (the outcome measure) were 22% in both intervention conditions. Thus, when FFT was compared with usual probation services, there was no difference in the outcomes.

Notwithstanding the absence of a formal CD diagnosis, further explanation for this outcome centers on a failure to disaggregate the heterogeneity of CD present in the sample and provide treatment according to a two or three pathway model. Inconsistent with this however, the authors do offer credence to the two pathway model in their method section by providing a break-down of the participant age of onset, using 12 years and younger as an early onset indicator. For
example, they stated that, “the criminal behavior started early for these adolescents, with 13.1% beginning before age 12, 63% between the ages of 12 and 14, and 23% between the ages of 14 and 17” (Sexton & Turner, 2010, p. 341). Yet, in the analysis no further attention was given to this useful data, and age of onset was not used to break down the heterogeneity that was clearly evident, or to inform treatment. The authors clearly acknowledge the heterogeneity of the offending youth, but they do not attempt to disaggregate the population into theoretically informed pathways for the purpose of treatment. Rather, a broad spectrum treatment approach (single pathway) appears to have been utilized in accordance with the theoretical underpinnings of the FFT model.

*FFT Disaggregates on the Basis of CU Traits – Application to the third pathway*

White, Frick, Lawing, & Bauer, (2012) conducted a study with 134 arrested youth (Age 11-17 years) to ascertain whether CU traits moderated the effectiveness of FFT. The study focused on whether offenders with and without CU traits showed differential treatment response based on parent and self-report ratings of emotional, behavioral, social functioning, and arrest records, all used as outcome indicators.

While youth with elevated CU traits did make some improvements, they also ended treatment with higher levels of emotional, social, and behavioral difficulties than antisocial youth with low CU trait levels. CU traits were negatively correlated with both parents’ and youths’ ratings of response to treatment, and were associated with poorer levels of adjustment post-treatment. Crucially also, CU traits were related to increased risk for violent re-offending during treatment.

The concern with this study is that no clear CD diagnoses were provided for participants. Additionally, the diversity of age range (11 to 17 years) indicated the presence of most sub-types
(two pathway) including those with CU traits (three pathway). Clearly, the authors recognized the influence of distinct subtypes on the data as it was stated, “..they enter treatment with more symptoms and higher risk” (White, Frick, Lawing, & Bauer, 2012, p. 271). Provision for this would have allowed for the parsing of early onset, adolescent onset, and those with elevated CU traits, to each sub group (a three path approach to treatment). In short, if consideration was given to further partitioning (apart from just those with CU traits), as well as tailoring treatment to their distinct needs, outcomes may have been more optimistic.

Finally, there seemed to be a strong socio-ecological aspect to this intervention, with little attention given to individual treatment needs. Despite the cohort being lower risk than most juvenile justice samples, thereby limiting the validity of generalising to more severe samples of offending youth, the results suggested that FFT had the potential to effect some improvements in youth with CU traits. However, these youth require individualized intervention because, as the authors correctly identified, they enter treatment with more symptoms than other youth and are at a higher risk of committing violence during treatment. This is consistent with research indicating that adolescent offenders with these traits are at increased risk for violent re-offending, whether treated in an institution or in the community (Gretton et al., 2001). Therefore, in order to maximize its effectiveness with this cohort, FFT may need to incorporate theoretically informed, individualized treatment responses and adopt a three pathway treatment approach alongside its socio-ecological treatment protocol.

**Multidimensional Treatment Foster Care (MTFC)**

MTFC was developed to provide a community-based foster care alternative to state detention and group care facilities. MTFC involves placing individual youths in well-trained and
supervised foster homes. Fundamental to MTFC is the consultation, training, and support of the foster parents including daily contact from the supervisors to provide ongoing support, and crisis intervention. The intervention techniques used in MTFC are derived from behavioral and cognitive-behavioral approaches and implemented within a socio-ecological framework. As such the foster parent plays a critical role in supervision and monitoring, engaging the youth in pro-social activities, disengagement from negative peers, and promoting positive school performance. MTFC intervention includes a treatment team of case managers, family therapists, individual therapists, skills trainers, and professional foster parents. The duration of treatment is 12 months including a critical 3 months at the conclusion of treatment to support the youth’s assimilation back into the birth family, and sustain positive behaviours.

MTFC was chosen as one of the ten most evidence based National Model Programs by the Office of Juvenile Justice and Delinquency Prevention, and was selected in 2009 by the Coalition for Evidence-Based Policy as meeting “top tier” evidence of effectiveness (Rhoades, Chamberlain, Roberts, & Leve, 2013).

**General Effectiveness of MTFC**

The first RCT conducted for MTFC after 1993, focused on 79 serious and chronic male adolescent offenders (Chamberlain & Reid, 1998). Participants were randomized to either MTFC or a community-based group care setting. The MTFC condition demonstrated significantly greater decreases in criminal charges and self-reported criminal behavior at one year post baseline. Additionally, MTFC youth spent 60% fewer days incarcerated during the year post entry. A two year follow up evaluation supported the sustainability of MTFC treatment effects for criminal behavior (Eddy, Whaley, & Chamberlain, 2004).
The following table provides a summary of the MTFC studies and results included in this review.

For the purpose of this study, the results include general outcomes of treatment as well as the findings of this review that are relevant to the research questions exploring the DSM 5 inferred pathway approach to assessment and treatment of CD in adolescents

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Method</th>
<th>Summary of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MTFC</strong> (RCT)</td>
<td>Serious and chronic male adolescent offenders (N = 79)</td>
<td></td>
<td>Significant decreases in criminal charges and 60% fewer days in custody at 1 year post baseline. A two year follow up supported sustainability of effects.</td>
</tr>
<tr>
<td><strong>MTFC</strong> (RCT)</td>
<td>Study had specific inclusion criteria of CD according to DSM-IV-TR</td>
<td>CBCL, YSR</td>
<td>At 24 month follow up MTFC was significantly more effective in reducing externalising symptoms and total symptoms on YSR and CBCL. Despite diagnosis of CD, there was no indication of any attempt to subtype for treatment purposes even though diversity of presentation suggested multiple subtypes. As such a moderating effect was likely, due to the presence of differential treatment needs within the same treatment condition</td>
</tr>
<tr>
<td>Westermark, Hansson, &amp; Olsson, (2011)</td>
<td>N=35 (18 male; 17 female) at risk of out of home placement; MTFC (20), TAU (15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MTFC</strong></td>
<td>Serious offenders; Mean Age =15, MTFC (N= 36), Custodial comparison(N= 24)</td>
<td>Asset Assessment Professional reports included ADHD, depression, anxiety, attempted suicide, neglect, learning disorder.*No reference to CD diagnosis</td>
<td>The number of offences decreased during treatment, and time spent in custody was reduced. Any positive effects however, dissipated when youth returned to their natural ecology. CD was not formally diagnosed, therefore no provision was made to break down the diversity by sub-typing age of onset or specifying for CU traits. The sample was unmatched due to the comparison group being more likely to have committed a violent crime.</td>
</tr>
<tr>
<td>Biehal, Ellison, &amp; Sinclair, (2011)</td>
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</table>
**MTFC Broad Spectrum Approach**

Biehal, Ellison, and Sinclair, (2011) compared serious and persistent offenders (N=50) who were either sentenced to MTFC Intensive Fostering (IF) (Mean Age =14.9; N=36), or a custodial comparison group (Mean Age =15.5; N=24). The groups were reported to be well-matched in characteristics and criminal histories.

MTFC (IF) effectiveness in reducing time spent in custody and the number of offences committed was restricted to the duration of treatment. Any positive effects dissipated once the youth were re-exposed to the risk factors in their local environment. The results highlighted the need to include more systemic treatment approaches that pay attention to the natural environment of the youth. Additionally, due to the diversity of presentation and differing needs within CD subtypes (present but not accounted for), a missed opportunity for disaggregation into a multiple pathway approach to treatment is evident. This is conspicuous from the difference between treatments at baseline showing that the comparison group was “more likely to have committed an index offence of violence against a person” (Biehal, Ellison, and Sinclair, 2011, p. 2045). In the light of extant research on CU traits and individual developmental pathways, not only was the sample unmatched, treatment did not account for the DSM 5 (APA, 2013) inferred treatment pathways.

The only study located for this model having specific inclusion criteria for diagnosed CD according to the DSM-IV-TR (American Psychiatric Association, 2000), was conducted by Westermark, Hansson, & Olsson (2011). Participants (N=35) with a diversity of complex behaviours and at risk of immediate out of home placement were randomized to MTFC (20) or treatment as usual (TAU-15). At 24-month follow-up, the MTFC condition had a significant
reduction in symptoms between baseline and post-base-line. MTFC was also significantly more effective than usual services at reducing youth externalizing symptoms and total symptoms on the YSR and CBCL (Achenbach, 1991 a,b).

This study demonstrated an attempt to disaggregate youth according to a specific inclusion criterion of CD. Yet, despite this and the clear diversity of presentation (which strongly inferred representations from both subtypes), there was no indication in the method of any attempt to separate out these groups for treatment purposes. It may be possible however that the study did take a two pathway approach (including an individualised treatment focus) but did not outline this in their method. Certainly the MTFC model allows for this as a consequence of having individual therapists on the treatment teams. Moreover, given CD with such a diversity of complex behaviours, it makes clinical sense to separate C/O from A/O for treatment purposes according to a dual pathway approach. Theoretically, even without including the specifier for CU traits, C/O CD is more complex and requires individualized treatment. Finally, the favorable results in this study may also be a consequence of the significantly lengthier duration of treatment offered by MTFC (12 months). This offers support to the contention of the Cochrane review that ‘longer term interventions, allied with more consistent, coordinated support, and including therapeutic support are necessary’ (Littell, Campbell, Green, & Toews, 2009).

A Treatment in an Institutional Setting Utilising a Three Pathway Approach

The final study under consideration is not one of the three community treatment models being reviewed. Rather, it concerns a treatment program for seriously offending adolescent males (n=142) with high CU traits at The Mendota Juvenile Treatment Center (MJTC) (Caldwell, Skeem, Salekin, & Van Rybrock, 2006). The rationale for including this study is to provide an
indication of the type of intensive individually based treatment that may be required to effect long term positive changes for adolescents with CD and high CU traits. For all intents and purposes this study demonstrates a pragmatic three pathway approach to treatment according to the model inferred by the DSM 5 (APA, 2013).

The majority of studies conducted in institutional settings comparing outcome of treatment for adolescents with CPs both with and without CU traits, have reported that those with elevated CU traits have poorer treatment outcomes including poorer institutional adjustment, more likely to re-offend, more negative behaviours, longer and lengthier stays in custody, and less likely to participate in treatment (Frick, Ray, Thornton, & Kahn, 2014).

The MJTC treatment program however, differs from the other institutional settings in that it is specifically geared toward reducing antagonistic interactions and interpersonal aggressiveness. The aim of MJTC is to break the cycle of increasing antagonistic, violent, and antisocial defiance to authority, and substitute these with appropriate responses to authority and society. Drawing from social control theory, which posits that barriers have emerged that continue to restrict youth from forming conventional and productive social bonds, the program focuses on helping youth to develop appropriate social skills and replace delinquent associations and behaviours with prosocial relationships and endeavors (Caldwell, Skeem, Salekin, & Van Rybrock, 2006).

The primary themes of the program include helping youth to accept responsibility for their behaviours, the resolving of mental health issues, and helping to foster and restore positive relationships with their families. Each young person is required to attend several individual counseling sessions weekly, as well as group therapy covering issues such as anger management, substance abuse, social skills, empathy skills, and problem solving. Involvement in school
education is also a requirement of the program.

MJTC utilizes a token economy called ‘Today-Tomorrow program’ which rewards youth with behavioural points that determine privileges for the following day. The program is very sensitive to changes in youth behaviour and targets youth self interest through the provision of incentives for treatment compliance and by rewarding appropriate prosocial behaviour with increasingly desirable rewards (computer time, snacks, game time, personal music).

The MJTC program has substantially more clinical staff than the usual correctional treatment and is designed to retain individuals with very challenging characteristics. In this way youth remain in treatment regardless of their behavior. Treatment duration is approximately 12 to 18 months (Caldwell, Skeem, Salekin, & Van Rybrock, 2006).

Participants in this study were predominantly serious juvenile offenders, 50% of whom were involved in crime before their tenth birthday. Of these youth, 51% were committed for violent crimes, and 49% had either seriously injured or killed a victim.

Assessment was comprehensive including cognitive functioning, age at which behavioral problems were first evident, age at first crime, prior charges, CD diagnosis using the DSM-IV-TR (APA, 2000), and psychopathy features assessed with the Psychopathy Checklist :Youth Version (PCL:YV - Forth et al., 2003).
Within 2 years of release, the youth treated in the MJTC were 20% less likely to re-offend than comparison cases. Youth treated at MJTC were also 2.7 times less likely to become violent in the community, and the treatment predicted slower and lower rates of violent recidivism.

The results contribute to the increasing weight of evidence that the violence potential of adolescents with high CU traits can be significantly reduced with interventions of sufficient intensity that are tailored to the unique characteristics of these youth (Gretton et al., 2000; Salekin, 2002). Clearly, this can only occur by disaggregating according to the specific subtypes of CD including specifying for the presence of CU traits, consistent with a three pathway approach to treatment. The findings also suggest that concentrating treatment resources on this high-risk group of youth may be the most effective and efficient means of reducing their violent and criminal behavior.

In support of an intensive and structured environment such as MJTC being necessary for effectively treating youth with elevated CU traits, Niranjan, Karnik, and Steiner (2007) stipulated that these adolescents require long-term and concerted systems of care to address and prevent an ongoing pathological trajectory. Therefore, whether it is an institutional setting or residential care, highly structured environments that utilize treatment modalities informed by research can allow for the development of a better reasoning system in high CU youth, and enable clinicians to appropriately address incidents of proactive aggression.

It is interesting to note that the MJTC treatment had a noticeable lack of impact on nonviolent offending. This makes sense in terms of research which suggests that in order to be effective, treatment must be both comprehensive and individualised. In the present case, the MJTC
treatment emphasis was on the individual. Consequently, the propensity for violent offending motivated by individual factors was reduced, while offenses influenced by life circumstances and the youth ecology (socio-ecological factors) were unaffected. In contrast, the emphasis of most studies in this review has been on the socio-ecological aspects of treatment, with less attention provided for individual factors.

To date, research on individual interventions has been weak due to the fact that offending youth are embedded in social and family networks that form their ecology. Recent research however, has begun to enlighten the understanding of individual pathways to delinquency, making room for individual treatment to play an important role in evidence based interventions (Niranjan, Karnik, and Steiner, 2007). In the present case for example, although remarkable treatment outcomes were achieved for these violent high CU adolescents in the MJTC institutional setting, the importance of adjunct systemic treatments in the community are critical in order to augment the individual gains achieved in treatment. Thus, pertaining to treatment response, it is possible that institutional settings such as MJTC are best suited to the individualised facets of treating youth with elevated CU traits, while community settings are more appropriate for the systemic, socio-ecological aspects of treatment for this group.

Results

The following table provides an overview of the approach taken by each particular study towards the treatment of serious antisocial behaviour in adolescents. In particular, whether or not a CD diagnosis has been made; if sub-typing has occurred according to a two and three pathway approach inferred by the DSM 5; and whether the treatment focus has been informed by this
pathway approach, or according to a broad spectrum, one size fits all application of the model (ie. single pathway approach)

Table 5

<table>
<thead>
<tr>
<th>Study</th>
<th>Age Range</th>
<th>Participants</th>
<th>Better than Comparison Y/N</th>
<th>CD Diagnosis Y/N</th>
<th>Subtyping Y/N</th>
<th>Treatment Focus (1,2,or 3 pathway)</th>
<th>Single Pathway (Socio-Ecological)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MST Curtis, Ronan, &amp; Crellin, 2009</td>
<td>8-17</td>
<td>Juvenile Offenders</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Single Pathway</td>
<td>Socio-Ecological</td>
</tr>
<tr>
<td>MST (RCT) Sundell at el., 2008; Lofholm, Olsson, Sundell, &amp; Hansson, 2009</td>
<td>12-17</td>
<td>Juvenile Offenders</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Single Pathway</td>
<td>Socio-Ecological</td>
</tr>
<tr>
<td>MST (RCT with inpatient treatment) Henggeler et al. 2003</td>
<td>10-17</td>
<td>Complex Behaviours</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Single Pathway</td>
<td>Socio-Ecological</td>
</tr>
<tr>
<td>MST (RCT) Rowland et al., 2005</td>
<td>9-17</td>
<td>Offending Youth/complex emotional disturbances</td>
<td>Marginally better for minor offences but not index offences</td>
<td>Y</td>
<td>N</td>
<td>Single Pathway</td>
<td>Socio-Ecological</td>
</tr>
<tr>
<td>MST (RCT) Butler, Baruch, Hickey, &amp; Fonargy (2011)</td>
<td>13-17</td>
<td>Offending Youth</td>
<td>Y</td>
<td>N for 2 pathway Y for 3 pathway</td>
<td>Single Pathway</td>
<td>Socio-Ecological</td>
<td></td>
</tr>
<tr>
<td>MST (RCT) Manders, Dekovic,</td>
<td>12-18</td>
<td>Youth with severe conduct problems</td>
<td>No advantage in reducing externalising problems</td>
<td>Y</td>
<td>N for 2 pathway Y for 3 pathway</td>
<td>Single Pathway</td>
<td>Socio-Ecological</td>
</tr>
<tr>
<td>Model</td>
<td>Reference</td>
<td>Age Range</td>
<td>Group</td>
<td>M</td>
<td>Pathway</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------</td>
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<td></td>
</tr>
<tr>
<td>FFT</td>
<td>White, Frick, Lauing, &amp; Bauer, 2012.</td>
<td>11-17</td>
<td>Arrested Youth</td>
<td>N</td>
<td>Y</td>
<td>N for 2 pathway Y for 3 pathway</td>
<td>Single Pathway (Socio-Ecological)</td>
</tr>
<tr>
<td>MTFC</td>
<td>Biehal, Ellison, &amp; Sinclair,</td>
<td>M=15</td>
<td>Serious and persistent offenders</td>
<td>N</td>
<td>N</td>
<td></td>
<td>Single Pathway (Socio-Ecological)</td>
</tr>
<tr>
<td>MJTC (Institutional Setting)</td>
<td>Caldwell, Skeem, Salekin, &amp; Van Rybrock, 2006</td>
<td>Serious and persistent offenders</td>
<td>Any positive gains dissipated at 12 months post</td>
<td>Y</td>
<td>Y</td>
<td>Y for both 2 and 3 pathway</td>
<td>3 Pathway Individualised</td>
</tr>
</tbody>
</table>

Overall, the results of the review provide an indication of the way in which MST, FFT, and MTFC approach the treatment of antisocial adolescents with CD. Effectively, both assessment and treatment are conducted in accord with the theoretical underpinnings of the respective models. Although each model has differences in emphasis, intensity, and duration, they are all strongly aligned with socio-ecological explanations of the causal and maintaining factors of
antisocial behaviour. As such, it appears that the majority of treatments do not follow a developmental pathway process to inform their approach, based on the differing treatment needs of the adolescent sub groups of CD. Rather, a broad spectrum, ‘one size fits all’ socio ecological treatment approach is administered to CD adolescents as though they were a homogenous group (single pathway). This is particularly clear from those studies with extensive age ranges (eg. 8-17 years) that have not disaggregated A/O and C/O when treating. In such cases, by failing to adopt a dual pathway approach to the treatment of A/O and C/O, inconsistent outcomes have frequently occurred due to pre-treatment heterogeneity and the moderating effects of the more complex behaviours of adolescents from the childhood onset group. In keeping with this, although most of the studies did not take into account the presence of CU traits (as this is new research, only recently included in DSM 5) the few studies that did, found that CU traits had a strong moderating effect on their broad spectrum, single pathway approach to treatment. The only study that did both assess and treat with a three pathway framework had significant clinical effectiveness. Despite being confined to an institutional setting, a DSM 5 approach to disaggregating for the purpose of differential treatment based on differing developmental pathways allowed for the triaging and appropriate treatment of the highest risk, most serious group of CD adolescents.

The present results clearly suggest that socio-ecological programs such as MST, FFT and MTFC need to advance in their effectiveness for treating youth with CD, and cannot continue to treat conduct disordered adolescents as a homogenous entity with a ‘one size fits all’ approach. This group has extreme diversity in presentation with multiple causal pathways contributing to their behaviours. As such, treatment protocols need to be implemented in concert with theoretically
informed assessment. This would necessarily require attending to the DSM 5 diagnostic criteria for CD, sub-typing according to age of onset, and specifying for CU traits. This practice will reduce heterogeneity and allow for the specific targeting of interventions that can address the unique psychopathology and needs of these adolescents. In short, practice needs to account for the known subtypes (including C/O, A/O and the specifier for CU traits) among young offenders, and tailor treatment so that the sub population will most benefit (White, Frick, Lawing, & Bauer, 2012).

Development of a Model

Based on the results and trends made apparent in the current review, a pathway model is proposed (Figure 1) to offer guidance with the clinically informed assessment and treatment of CD. The model has been adapted from the research that has informed the diagnostic criteria for CD since the publication of the DSM IV (APA, 1994). Specifically, a three pathway model of assessment is proposed which recognizes the importance of sub-typing according to age of onset and specifying for CU traits. The aim of the model is to highlight the growing complexity and diversity of CD with increasing age, as well as to provide guidance with the assessment process, and possible treatment options.

Commencing with Childhood (pink) at the top of the figure, arrows indicate the differing paths conduct problems can take. The untreated or unremitting childhood conduct problems stream into Adolescent Antisocial Behaviour (sky blue) in the middle of the diagram, together with Adolescent Onset conduct problems. At this point, intervention has become far more complex and crucially requires sub-typing according to the developmental pathways of CD, followed by allocation to differential treatments. The term ‘super treatment’ has been specifically chosen in this model to apply to C/O CD youth (with both high and low CU traits) who have missed out on
childhood intervention. As such, these youth are presenting with chronic and severe antisocial behaviour that requires long term, multimodal interventions with adjunctive individualized treatment components informed by theory. Finally, (portrayed at the bottom of the diagram) if treatment does not prove to be successful in adolescence, adult psychopathology is a likely outcome. The type of psychopathology may be strongly associated with the different pathways that flow from adolescence into Adulthood (blue) at the bottom of the figure. For example, untreated or unsuccessfully treated C/O adolescents with high CU traits may become psychopathic adults; untreated or unsuccessfully treated C/O adolescents with low CU traits may develop ASPD; and untreated or unsuccessfully treated A/O may develop into diverse adult psychopathology.
Table 6: Legend for Proposed Model:

**Differential Treatment 1**
Childhood treatment for conduct problems with low levels of CU traits eg. Parent Training or Parent Management Training that focuses on changing the parent’s reinforcement contingencies maintaining the problem behaviors of their children (Webster-Stratton & Herbert, 1993).

**Differential Treatment 2**
Childhood treatment for Conduct problems with elevated CU traits. For example, Parent Training that focuses on positive reinforcement and parent/child regulation, plus a CT (child treatment) component that is tailored to address the development of affective empathy and perspective taking (Somech & Elizur, 2012).

**Differential Treatment 3**
Treatment of Adolescent Onset CD. A/O should be considered in its social and environmental context, taking into account factors such as family stressors, negative peer influence, substance abuse, and school difficulties. In these cases interventions that focus on improving the consistency and availability of caregivers, improving monitoring and supervision and identifying strengths in the young person’s ecology can often bring about a cessation of antisocial behaviour (Salekin, Worley, & Grimes, 2010; Moffit et al., 2008). Multimodal treatments such as MST are ideally suited to the treatment of this group.

**Differential Super-Treatment 1**
Adolescent presentation of Childhood Onset CD, with low levels of CU traits. This group requires a multimodal intervention (such as MST, FFT, & MTFC) that incorporates or is coordinated with an adjunctive individualized treatment of sufficient length and intensity to address the temperamental aspects of reactive aggression and emotional regulation in the young person (eg. anger management, problem solving, perspective taking, CBT).

**Differential Super-Treatment 2**
Adolescent presentation of Childhood Onset CD, with elevated CU traits. This group requires intensive and extended individualized treatment informed by assessment that targets pro-active aggression by teaching empathy skills and targeting youth self interest. Crucially, this needs to be supplemented by long-term, consistently applied, family-based socio-ecological intervention. This is in keeping with research showing that those with psychopathic traits are more responsive to combined methods of treatment and for longer periods of time. Moreover, that any change in the patient must be supported in such a way that it generalizes to daily life (Lee & Phil, 1997).
Figure 1.1 Iterative model of assessment and differential treatment needs for CD in children and adolescents.
Discussion

The findings of the review although not conclusive due to the small number of studies available, were clear enough to answer the research questions. The results highlighted a trend in the utilization of a single pathway process or ‘one size fits all’ approach to the assessment and treatment of CD. On the whole, the treatments in all three modalities were no more or less effective in treating the general CD (disaggregated) population than comparison treatments. In addition, the studies in the review that did attempt to address CU traits, although acknowledging the particular pathway for the purposes of the study, did not adjust treatment to the unique needs of the subgroup. Further, they did not disaggregate between A/O and C/O in order to address the needs of these two particular subgroups.

In contrast to this and in spite of the limited number of studies available to confirm that a developmental pathway process may be superior to the generalized approach, the studies that did disaggregate antisocial youth (such as ACE and MJTC) obtained more positive outcomes by adapting their treatment to the differential needs of the subgroups represented.

Thus the present results provide sufficient evidence to suggest that the practice of assessment and treatment in the three subject treatment modalities does not routinely follow a pathway process by sub-typing according to age of onset and then further specifying for CU traits. As such, the results suggest that the three pathway process inferred by the recent publication of the DSM5 may not be easily adopted without sufficient attention being focused on the validity of this approach. Therefore, it is posited that a method which simplifies the procedure (such as the model proposed herein) may be a step towards facilitating the increased adoption of this pathway process.
The model that has been presented is a simple adaptation of the developmental pathways leading to CD that are inferred by the DSM 5 (APA, 2013). As such, it provides a visual flowchart for clinicians to be able to assess on which particular pathway a young person may be situated, and therefore inform the treatment approach and intensity that may be required. The model is a preliminary scaffold that requires more research to support its validity at each level of assessment and treatment. In short, the model requires application and feedback, and will benefit from further studies that confirm or disconfirm its applicability.

**Application of the Model**

By following the developmental pathway process outlined in this model, medical professionals, clinicians, and treatment programs can be more aligned in their assessments and therefore ensure that referrals are made to the most appropriate treatment providers.

The proposed model may be well suited to Juvenile Justice settings as an aid to risk assessment and in triaging the most intensive treatments towards the highest risk groups. Specifically, the application of the model will help to facilitate a more vigilant approach to sub-typing C/O and A/O, and then specifying for CU traits. This could provide invaluable support towards achieving consistent risk assessment and treatment planning in accord with the Risk Need Responsivity (RNR) practice used in the Juvenile Justice System (Andrews & Bonta, 2003). Additionally, although base rates of CD are relatively low in the general community, they are understandably high in juvenile justice settings. Clearly, with such high levels of CD presentation, viewing them as a homogenous group is too broad a category to be able to clinically understand and therefore target for appropriate treatment. However, the utilization of the pathway model which is completely congruent with the RNR process will help to validate the important decision of
allocating the greatest treatment resources to those with the highest risk for re-offending. Thus, a pathway approach to assessment and treatment could have strong benefits in terms of targeting treatment in the Juvenile Justice system. Nevertheless, the model should only act as a guide to assessment, and be used in concert with both static and dynamic risk factors present for each young person.

Crucially also, the adoption of this model could pave the way for the coordinated continuity of treatment, commencing for example, with an individualized focus in an institutional setting such as MJTC, and then transitioning to a socio-ecological approach using MST in the community.

Primarily, it is hoped that the model will encourage more clinicians and treatment providers to adopt and follow this pathway approach to CD. Either way, whether supported, adjusted, or disconfirmed, a clear process of treatment is needed for this multifaceted group of adolescents so that their assessment and treatment is more consistent, robust, and reliable.

Limitations

The model does not account for frequent co-morbid problems such as ADHD, anxiety, and depression. However, the model may be added to, in an iterative manner. For example, C/O CD with co-morbid ADHD will require ‘super treatment’ plus adjunctive medication.

The model assumes easy access to intervention and to the resources necessary for the effective treatment of these adolescents. However, these programs can be very expensive, difficult to access, and often not readily available. In terms of government policy for example, where cost is an over-riding factor, a young person with C/O CD who is at high risk of life course persistence will require comprehensive, individualized, long term treatment that will be expensive to administer, and subject to its availability.
Few studies have demonstrated a decisive application of this pathway approach to assessment and treatment, so follow up studies are needed to test the model and make any necessary adjustments.

**Methodological implications**

Many of the studies in this review have focused on alleviating risk factors associated with antisocial behavior. In so doing, only those risk factors salient to the behaviours of a particular sub group of antisocial youth have been scrutinized. For example, in explaining the inconsistency between parental report and youth endorsement of aggressive behavior on the APSD (Frick, 2001), Butler and colleagues (2011), suggested that it is common for youth to minimise their aggressive behaviour. This may be true for the sub group with reactive aggression and low CU traits however the literature suggests that young people with high CU traits and proactive aggression will readily endorse their aggressive behaviour (Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Frick, Cornell, Barry, Bodin, & Dane, 2003).

Similarly, differential associations with important risk factors for CU traits and antisocial behavior may be obscured by the high correlation between these two constructs (Frick & White, 2008). For example, C/O CD youth with low CU traits tend to have higher rates of anxiety than C/O CD youth with high CU traits (Frick, 1999). Therefore, if studies fail to control for levels of CU traits with these youth, the differential associations between their conduct problems and anxiety is likely to be suppressed. For example, in a sample of clinic-referred children, conduct problems were found to be only moderately associated with anxiety, however, the association became much stronger when levels of CU traits were controlled (Frick et al., 1999). Further, a non-significant negative correlation between CU traits and anxiety became significant after
controlling for conduct problems. In this way studies can obscure the fact that the risk factor under scrutiny is only salient to the behavior of a particular subgroup of antisocial and aggressive youth. Further, by treating the CPs as homogenous, important and informative relationships are obscured. Thus, through the process of sub-typing, consistent with a pathway model, the errors incurred by focusing on main effects of risk factors and ignoring the multivariate associations can be avoided.

In keeping with this, MST, FFT and MTFC clearly have the potential to treat adolescents with severe CPs and CU traits. However, in addition to therapists being taught to consider the multiple factors that lead to antisocial behavior, they also require a working knowledge of the research pertaining to youth with CU traits. In particular, education pertinent to the unique characteristics of these youth such as a lack of responsiveness to distress in others, overestimation of the potential gains associated with aggression, and a tendency to focus on rewards over punishments (Frick, 2009). Treatments that consider these characteristics in their intervention approach will enable MST, FFT and MTFC therapists to enhance their ability to tailor interventions to the needs of this clinically important group of antisocial youths (Caldwell et al., 2006). In this respect, an ideal model of treatment for these youth would combine the individualised treatment informed by SCIP for example, alongside a multi-modal socio-ecological approach such as MST, FFT or MTFC (Frick, 2007). Feasibly, this would be accomplished by assessing how the youth responds to opportunities for aggressive behaviours (either reactively or proactively), and then implementing and maintaining responses to the different forms of aggression consistently at each level of the youth’s ecology (Frick, 2009).
Future Research

Coinciding with the recent publication of the DSM5 it is anticipated that there will be further research conducted on CU traits and this may facilitate opportunities for looking at multiple pathway approaches to CD treatment.

Future research could also benefit by testing the model more directly. An example of this might be a study comparing the MST broad spectrum approach with a MST multiple pathway approach (by sub-typing A/O and C/O and specifying for those with elevated CU traits) that incorporates MST with the individual treatment requirements that have been informed by the assessment of each particular subgroup. Research of this nature will help to clarify and focus appropriate treatment towards the distinct needs of adolescents presenting with a CD diagnosis.

Conclusion

Clearly C/O CD that does continue into adolescence is positioned to be at far greater risk of adult pathology due to an absence of treatment, or inadequate treatment in childhood. Many children have cycled through systems of care and either failed to be identified as requiring treatment, or have been poorly or inappropriately treated. Either way, their presentation as adolescents is appreciably more complex. These youth have missed the opportunity to have their conduct problems remitted in childhood (ie childhood limited CD) and now their behaviours and personality are becoming more obdurate and less malleable to remediation. The challenge for treatment programs such as MST, FFT, and MTFC is to restrict their conduct problems to adolescence. With the risk of ‘life course persistence’ now far greater, subdivision into levels of risk towards psychopathic or antisocial personality disorder (APD) is imperative for effective treatment. This involves reducing the heterogeneity by the subdivision of C/O and A/O, followed
by partitioning those with elevated CU traits, which, based on the theory will typically be limited to C/O group. It is the contention of this review that only long-term, consistently applied, multimodal interventions that necessarily include an intensive and individualised treatment component (that is informed by assessment), will alter these antisocial trajectories (Miller, 2014)
References


