# Characterising usual services offered to adolescent offenders in a randomised controlled trial: Assessing risk-need-responsivity in the management-as-usual arm of the Systemic Therapy for At Risk Teens trial

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D.Clin.Psy Thesis (Volume 1)

2019

University College London

# UCL Doctorate in Clinical Psychology
# Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature:

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## Overview

Antisocial behaviour in adolescence is a growing public concern and contributes to significant societal burden. This thesis focuses on the usual services available to this population of young people and comprises of three parts.

Part One is a systematic review examining the evidence base for multisystemic Therapy (MST). It focuses on of the role of management-as-usual (MAU) conditions within the evidence base. Whilst several included studies often support the efficacy of MST, the outcome data are mixed. Socio-political context is implicated in these differences, acknowledging that within differing contexts usual service provision differs and therefore so too does MAU in empirical studies. It demonstrates that where MAU is used as a comparator trial outcome must be considered relative to the context in which it was conducted and highlights the need for researchers to thoroughly document MAU to enable replicability and generalisability.

Part Two is an empirical study that uses the data from the Systemic Therapy for At Risk Teens (START) trial to consider usual service provision across the United Kingdom. It identifies specific risks through bifactor analyses of clinical measures, and then considers the dynamic and reciprocal nature of risks by identifying profiles of risks and needs using latent profile analysis (LPA). It then assesses the degree to which MAU is differentially provided based upon risk and need, in line with risk-need-responsivity.

Part Three provides a critical appraisal of the research. It discusses the challenges associated with risk-focused research and the ethical dilemmas that such research poses.

## Impact Statement

Antisocial adolescents are often a marginalised group who present with complex risks and needs. This thesis is concerned with understanding these risks and needs and establishing how usual service provision is impacted by them. As a result, the potential impact it may have is located both within the academic arena and in the clinical settings where these young people receive care.

First, the thesis focuses upon how usual services differ internationally. Through the systematic literature review it highlights the challenges of management-as-usual (MAU) comparator conditions. It identifies that within the evidence base MAU often refers to an expansive range of interventions ranging from no intervention, intensive home-based care through to incarceration. It discusses the impact that this has upon the evidence base, particularly when effect sizes are pooled resulting in overestimation of effect sizes. The impact this has upon research, particularly randomised controlled trial design, is vast as this reinforces the guidance provided by CONSORT calling for greater levels of scrutiny, standardisation and conceptualisation of comparator arms.

Second, the empirical paper utilises bifactor analysis to establish “pure” risks within a sample of antisocial youth. It further considers how risks and needs cluster together giving rise to distinct profiles of antisocial young people. Due to constraints of the sample, and its fixed size, it was not possible to include all variables of interest within this analysis. However, whilst this presents as a limitation, it highlights a direction for future research to support the understanding of this complex group. Moreover, the study aimed to conceptualise usual service provision for subsections of offenders, but as the service utilisation data came from routine practice it was non-parametric and patchy, leaving inconclusive results. Future research may learn from this and consider using latent profile analysis (LPA) to conceptualise service provision and then assess the characteristics of young people provided with different service

patterns. In doing so, it may build on current understanding and perhaps provide a more comprehensive and cohesive understanding of usual service provision for adolescents “at risk”.

Despite these limitations, the current study provides some clinical impact. It tested the common assumption that antisocial adolescents are a homogenous group. It demonstrated that within the sample this was not the case, but rather there were three statistically distinct groups which all presented with differing underlying risks and needs. It further highlighted that services appear to be providing intervention differentially based on risk and need.

However, it also found that for those individuals with the greatest criminogenic history, lower levels of service were provided throughout the trial. Future research may explore this further, as within the current study it was not possible to control for service utilisation before trial commencement and therefore it is unclear if services had already been provided to these young people. Whilst the study has not been able to answer this, it poses an important question for future research and for clinical service provision, as currently it is not possible to ascertain whether services to high risk young offenders are being offered, or if they have been exhausted or if young people are not engaging. Answering such questions would enable service development to ensure complex cohorts are supported within community settings.

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## Acknowledgements

I would like to thank my supervisors, Dr Stephen Butler, Professor Peter Fonagy and Dr Rob Saunders for each playing a pivotal role in the development of this thesis. I thank Dr Stephen Butler for his enthusiasm and support developing the research question, Professor Peter Fonagy for his support with continued conceptual development and Dr Rob Saunders for his patience and statistical know-how. Each has provided expertise and assistance every step of the way, and it has been both a pleasure and a privilege to work with each one of you.

Additionally, I would like to thank the women at HMP YOI Bronzefield and the young people at New River College who I had the honour of working with whilst completing this thesis. All these individuals brought to life the challenges described within the thesis and helped me to understand true impact of ‘usual’ and ‘unusual’ service provision.

Finally, I would like to thank my friends and family for supporting me over the last three years. Your practical and emotional support have been greatly appreciated. I promise I will never ask you to proofread another thing!

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# Part One: Literature Review

What is management as usual? A systematic review of randomised controlled trials assessing the efficacy and effectiveness of multi-systemic therapy

# Abstract

**Introduction:** Evidence based practice relies on a high quality and valid evidence base to inform routine practice. Recently, study design, particularly the quality and conceptualisation of comparator interventions, have been implicated in reduced validity. Within this, “management as usual” (MAU) conditions are of concern. The current systematic review examined influence of MAU within the multisystemic therapy (MST) literature.

**Method:** A systematic literature search was conducted across PsycINFO, Medline and Web of Science to identify studies appropriate for review. Inclusion criteria specified that all studies must take the methodological approach of a randomised controlled trial (RCT), be the primary trial publication and pertain to MST efficacy. Quality was assessed utilising the Consolidated Standards of Reporting Trials (CONSORT) Non-Pharmacological Trial (NPT) checklist, however, all studies were included as the study aimed to consider the influence of poor design on outcome.

**Results:** Twenty-six studies met inclusion criteria and were included in the review. MAU was poorly defined in the majority of studies included across all domains. Within physical health MAU was most sufficiently defined; however, within this condition MAU presented as a control. Where MAU was multimodal this was poorly documented, however, it is in this context that MST appears no more effective than MAU.

**Conclusions**: It is unclear to what degree MAU influences trial outcomes; however, it is clear that where RCTs utilise MAU as a comparator condition, further work is to be done. Due to poor conceptualisation and reporting of MAU conditions, RCT data remain hard to interpret, making it hard to ascertain the added value that new interventions bring. This results in evidence-based practice (EBP) being informed by overestimated pooled effect sizes.

# Introduction

MST is a systemic intervention for adolescents presenting with risk behaviours. It has an expansive evidence base and is currently heralded as a gold standard intervention for a myriad of difficulties encountered by young people and their families (NICE, 2017). Whilst initially developed as an intervention to target the systemic needs of antisocial and offending adolescents (Henggeler, Schoenwald, Boruin, Rowland & Cunningham, 1998), MST has now been adapted and evaluated in the context of a number of presenting problems such as HIV, asthma, problem sexual behaviour, psychiatric illness and for issues of child abuse and neglect (Multisystemic therapy: research at a glance, 2019) . However, whilst MST has been subject to several RCTs, mostly considering MST's application to offending behaviour, outcomes are mixed. In fact, reviews assessing MST's efficacy often report inconsistent and mixed findings, particularly when conducted outside the United States where MST was developed (Curtis et al, 2004; Littell, Popa & Forsythe, 2005; Löfholm, Brannstrom, Olsson & Hansson, 2012; Markham, 2017). In line with RCTs in other areas of psychological research, one factor thought to contribute to such differences in MST outcome data is the conceptualisation of management-as-usual conditions (MAU) (Little et al., 2005). The aim of this paper is to examine the effects MAU conceptualisation has on RCT outcomes for adolescent risk behaviour. It will do so by examining the influence MAU conditions have on trial outcomes pertaining to multisystemic therapy (MST).

Since its conception, evidence-based practice (EBP) has become an integral feature of health and social care practice (Chambless & Hollon, 1998; MacMahon & Collins, 2001). Across all domains of physical and mental health care, EBP is championed as the most effective way to provide high quality care that enables continued service development through the introduction of new and better interventions as part of routine practice. However, for EBP to be of clinical utility it is

important to first consider the validity of the evidence base informing it (Rothwell, 2005).

To ensure clinical validity, research evaluating new interventions places a strong focus on both efficacy and effectiveness. However, for such evaluations to be made it is imperative that interventions and their outcomes are compared. With respect to study design and methodology, randomised controlled trials (RCTs) are considered the gold standard for evaluating efficacy and effectiveness within clinical research, and as such they constitute the majority of evidence for psychological interventions (Schulz, Altman & Moher, 2010; Siepmann et al., 2016). In line with this, new interventions or treatments are assessed through RCTs where they are compared to comparisons conditions. Within this, such comparisons can be broadly categorised as “no intervention” control conditions or “active intervention” conditions. Within the second category, active interventions, there is a broad array of comparison conceptualisations. Of particular interest, however, are conditions described as “management as usual” (MAU) (Löfholm, Brannstrom, Olsson & Hansson, 2012). MAU is an umbrella term utilised within clinical research which refers to comparison conditions that are drawn from routine practice (Kazdin, 2015). It encompasses a range of interventions provided within usual services, often in line with current best practice guidance (Thompson & Schoenfeld, 2007). As such, comparative effectiveness studies utilising MAU are regularly held in high esteem and are promoted within the field due to the added value they provide.

Despite the benefits such comparisons studies may yield, many aspects of RCT methodology have been subject to scrutiny (Bellg et al., 2004; Mohr et al., 2015). Most recently, the interpretability of RCT data has been called into question and queries have been raised with regard to shortcomings in study design (Krauss, 2018). These shortcomings are often thought to stem from inappropriate or poor-quality comparator conditions being utilised (Mann & Djulbegovic, 2013). More specifically in

psychological research, these shortcomings are felt to arise from how comparator conditions, particularly MAU, are conceptualised and delivered (Viergever, Karam, Reis & Ghersi, 2014). It is accepted that choosing appropriate comparator conditions is vital to ensure that outcome data is both interpretable and meaningful, enabling translation into clinical practice. For this reason, MAU conditions, and how these are conceptualised, are of concern. Whilst MAU conditions provide an opportunity for increased external validity (Rothwell, 2006), MAU variations between studies as a result of service-related differences and differences in service provision over time (Witt et al., 2018) present a number of challenges which may reduce internal validity. Such reductions present through limited standardisation giving rise to bias, poor generalisability and increased error (Freedland et al., 2011; Reith et al., 2013). For this reason, the Consolidated Standards of Reporting Trials (CONSORT) provide guidance for the development and reporting of randomised controlled trials, and place great emphasis upon the role of appropriate comparator groups (Schulz, Altman & Moher, 2010). However, they emphasise the importance of thoroughly documenting what MAU constitutes (Mohr at al., 2010).

Focusing particularly on the evidence base pertaining to the efficacy and effectiveness of MST we see that outcomes are mixed. However, despite mixed outcome data, MST has been incorporated into the National Institute for Health and Clinical Excellence guidance for the management of antisocial youth (NICE, 2013), harmful sexual behaviour among children and adolescents (NICE, 2016) and for child abuse and neglect (NICE, 2017) as well as a number of international guidance documents (National Institute on Drug Abuse, 1999; U.S. Public Health Service, 2001). It is therefore consequently delivered by more than 15 countries, and across England, Scotland and Northern Ireland alone there are 28 teams in operation offering a range of MST treatments, including MST for problem sexual behaviour (MST-PSB), MST for family integrated transitions (MST-FIT) and MST for child abuse and neglect

(MST-CAN). Given the rate of uptake, it might be assumed that MST has demonstrated consistent outcomes across these varied settings. However, this is not the case and emphasises the importance of examining outcome validity within the evidence base that contributes to EBP. Whilst outcomes may be dependent on study design, such studies inform and influence current clinical practice and patient care.

Several systematic reviews have begun to consider the differences in MST outcomes; however, these reviews present a limited assessment of MST, focusing only on specific groups in which MST has been applied, and do not specifically consider the validity of outcomes (Curtis et al, 2004; Littell et al., 2005; Löfholm et al., 2012; Markham, 2017; Pane, White, Nadorff, Grills-Taquechel & Stanley, 2013). Within these limited assessments of MST, most of these reviews restrict their focus to the application of MST to youth offending populations and as such are only able to consider the differences observed when MST is transported globally. Only one review considers MST's efficacy when adapted to alternate organisational contexts, such as when MST is provided in health and social care contexts (Pane et al., 2013). However, no review considers the whole body of literature pertaining to MST and therefore comparisons across and between these contexts are lacking. Nonetheless, these papers offer a helpful contribution and comment on MST's performance with isolated client groups. They highlight that when MST has been applied internationally, the success it has achieved within an American context does not always translate to other international contexts. In fact, studies within Western Europe provide a very different picture as outcomes are mixed. Authors propose that the differences observed may, in part, be due to the broad range of socio-political contexts in which MST is applied (Littell et al., 2005; Löfholm et al., 2012). Within these contexts we see vast differences in policy, resulting in differing judicial processes and healthcare provision. The impact these differences have on MST and the efficacy data is vast, ranging from differing MAU conditions to differences in outcome measures. Despite

these important findings, the nature of MAU is rarely investigated and whilst acknowledged as a source of heterogeneity within these reviews (Watts et al., 2015), little has been done to consider how the varied conceptualisation of MAU impacts upon outcomes (Markham, 2017; Pane et al., 2013; Löfholm, et al., 2012; Littell et al., 2005, & Curtis et al., 2004). It is therefore hard to ascertain MST's true added value. The Cochrane review presented by Littell and colleagues (2005) assessing MST's efficacy in social, emotional and behavioural problems concludes that it is not possible to determine if MST is consistently more effective than usual services. The authors suggest that comparison conditions, or MAU, was one of many factors that contributed to mixed efficacy data. This echoes the opinion put forth by Löfholm et al. (2012) suggesting that the quality of the comparator arm may directly influence outcome in MST efficacy trials.

In relation to MST, and its effectiveness globally, this is an important consideration, as what is provided as MAU will differ across international and organisational contexts, particularly when expanded into physical health, mental health, substance misuse and child protection settings. It is accepted that within a range of international settings, and across the scope of MST's adapted delivery contexts, usual service provision is likely to differ. However, within the body of literature, the differences in MAU provision appear poorly documented. A review considering the impact of MAU conditions utilises MST as an example (Löfholm et al., 2013). Whilst this review holds a limited scope, looking exclusively at trials where MST's efficacy was measured through arrest and incarceration data, it highlights the influence of MAU upon outcomes across this small subsection of the literature. The authors suggest that despite MST being considered a well evidenced intervention, the reporting of trials is often poor, making it hard to ascertain what the comparator intervention consisted of. This is a clear limitation of the literature, as this creates a level of complexity which makes interpretation of the efficacy data difficult.

This review aims to build upon these studies and consider how MAU impacts outcomes across all MST's delivery contexts by exploring the diversity of MAU and its delivery in all organisational settings. This is a timely addition to the literature as currently we see this issue arising not only with regard to MST, but also in evaluations of similar interventions such as family functional therapy (FFT). These evaluations echo the results of the recent European trails of MST, where FFT or MST + MAU yield no more effective outcomes than "management as usual" in reducing out of home placement (Fonagy et al., 2018; Humayan et al., 2017). Here, we see that where usual services take a multidimensional approach to patient care the added value of MST's treatment approach decreases. In line with this, authors themselves have highlighted a need for "more intense scrutiny of 'management as usual' conditions" (Humayun et al., 2017).

## Current Review

It is this intense level of scrutiny that this review aims to apply, by systematically reviewing MAU within the context of all MST RCTs including MST's efficacy in antisocial behaviour, behavioural difficulties, mental health, physical health, substance misuse and child protection. The current review will do so both by exploring the degree to which these trials adhere to the guidance provided by CONSORT, with a focus on the conceptualisation of comparators including "management as usual" (MAU), and also by providing a narrative synthesis of management as usual conditions and their influence on outcomes.

It will aim to address the following questions:

1. How are characteristics of comparators (MAU) documented and defined within MST RCTs?

2. Does context (e.g. organisational context, diagnostic context and international context) impact how the characteristics of comparators have been documented and defined within MST RCTs?

3. Are comparator interventions defined in terms of theoretical underpinning?

# Methods

## Search Strategy for Identifying Studies

As the review aimed to consider the influence of comparators on the outcome in randomised controlled trials (RCT) of multisystemic therapy (MST), the guidance set out by preferred reporting items for systematic reviews and meta-analyses (PRISMA) was followed (Moher, Liberati, Tetzlaff, & Altman, 2009). In line with this, preliminary scoping searches revealed that MST literature is widely dispersed. As such, searches were performed across three distinct research databases covering a range of academic disciplines: PsycINFO, MEDLine and Web of Science.

## Study Inclusion Criteria

Study inclusion criteria were guided by the specific review criteria. As the review aims to examine management as usual within MST RCTs, inclusion criteria specified that the methodological approach of studies must be that of a randomised controlled trial and that studies included were the primary publication for the trial. Previous reviews of MST literature suggest that primary publications may provide a greater level of detail with regard to trial methodology and implementation than subsequent publications (Littell, 2005).

## Search Strategy

On the 7th of September 2018 each database was systematically searched for relevant studies. The research question was broken into its core concepts,

including the specific inclusion criteria. The database thesaurus was used to check for, and include, synonyms for the keywords, searching for articles that examined: (1) multi-systemic therapy in a (2) randomised control trial context. These exploded terms were then used in combination to organise the key terms. The search terms selected were intentionally broadly inclusive to ensure that articles encompassed all the multi-systemic therapy research and not just those articles exclusively pertaining to youth offending. To ensure that all relevant articles were retrieved, synonyms for each of these factors were employed in the search syntax, and can be found in Appendix A.

### Process for Study Selection

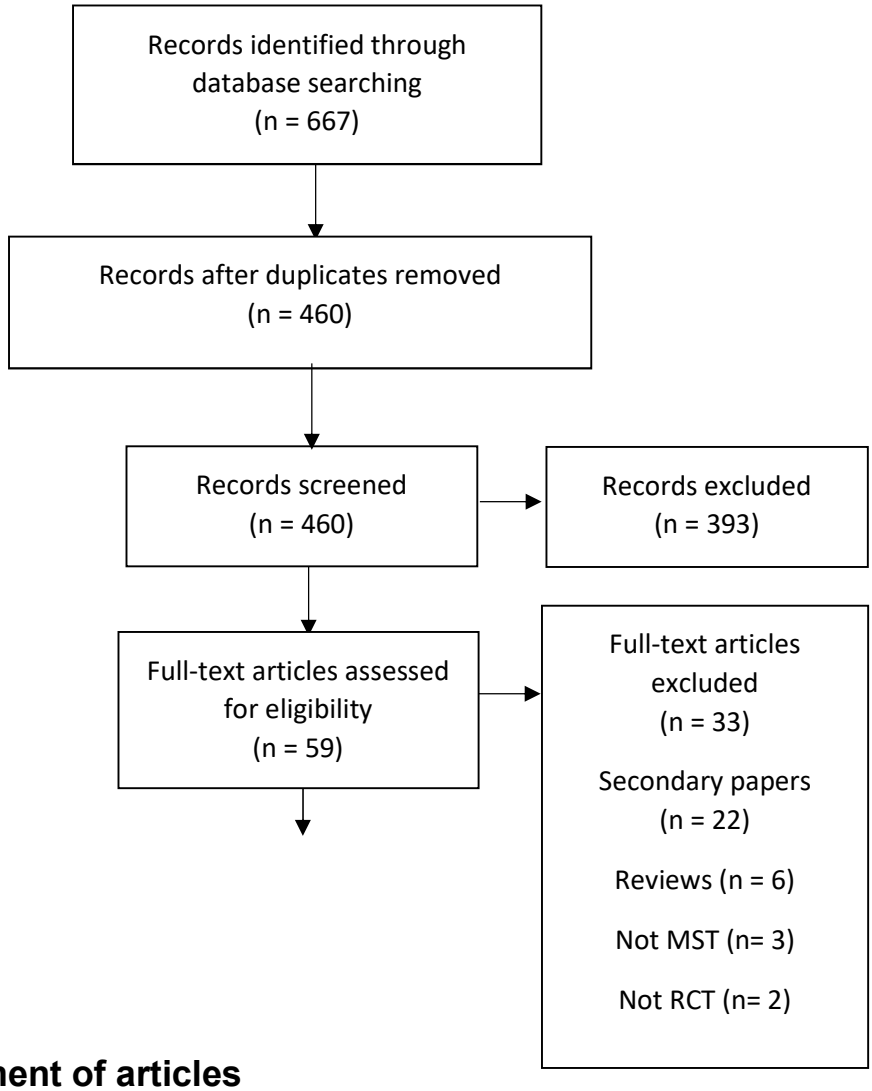
Study selection was based upon inclusion criteria and was conducted in phases: please see Figure 1. Database search data were exported into Microsoft Excel and duplicates were removed. Each reference was then screened against the predefined inclusion criteria by reading the study title and abstract. Articles that passed screening were then retrieved for further evaluation. Unfortunately, due to the available time and resource available, the screening process and eligibility assessment was performed by a single reviewer.

# Results

The PsychINFO (n=199), OVID MEDLINE (n=112) and Web of Science (n= 356) search identified 667 potential studies; of these 460 remained when duplicate studies were removed. Abstracts of these 460 articles were screened according to the inclusion criteria, where 393 were removed as the focus of these papers was not MST and/or did not take the form of a RCT. Of the remaining 59 papers, upon full-text review, 22 were identified as secondary publications and were therefore excluded. Twenty-six studies met criteria and were included in formal quality and relevance assessment. Whilst it was

considered important to focus upon the primary publication for each trial, where secondary studies were identified, these were cross-checked for additional information.

**Figure 1. PRISMA Flow Chart Showing Article Retrieval**




## Quality assessment of articles

As the current review focuses exclusively on articles reporting outcomes from randomised controlled trials, quality assurance and appraisal was conducted using the CONSORT checklist for non-pharmacologic treatments (NPTs) (Boutron, Altman, Moher, Schulz & Ravaud, 2017). This checklist was developed as an extension to the CONSORT guidelines to include non-pharmaceutical trials.

In total the CONSORT NPT checklist identifies 37 (sub)items as integral for high quality reporting. Each item is of equal importance, and therefore scores for items were weighted equally. A score of one was awarded if the specific details outlined within the CONSORT item had been reported. Conversely, where details outlined in a CONSORT item had not been reported, or were only partially reported, a score of zero was awarded. To gain an overall quality score, the number of adequately reported items were divided by a possible total of 37, resulting in a percentage score of each study.

The included studies ranged in quality (see Appendix B). Nine of these were rated "strong", 11 were rated as "good" and six were rated "weak". Considering the focus of this review, studies that received a low-quality assessment were not excluded from the synthesis. As the review aims to consider how comparators are described and their characteristics defined, it was considered important to include papers of all qualities.

## Characteristics of included articles

All studies included, in line with the inclusion criteria, were RCTs evaluating the efficacy of MST against a comparator intervention. These studies predominantly considered MST in the context of antisocial and offending behaviour encompassing MST for serious juvenile offending (Butler, Brauch, Hickey & Fonagy, 2001; Borduin et al., 1995; Fonagy et al., 2018; Glisson et al., 2010;; Henggeler, Melton & Smith, 1997; Timmons-Mitchell, Bender, Krishna & Mitchell, 2006), sex offending (Borduin, Henggeler, Blaske, & Stein, 1990; Borduin, Schaeffer & Heiblum, 2009; Letourneau et al., 2009), substance misuse difficulties (Henggeler, Pickrel, Brondino & Crouch, 1996; Henggeler et al., 2006) and in the context of conduct disorder (without contact with the youth justice system) (Asscher, Dekovic, Manders, van der Laan & Prins, 2013; Ogden & Halliday-Boykins, 2004; Sundell et al., 2008; Wiess et al.,2013).

Additional studies included the use of MST in the context of physical health difficulties (Ellis et al., 2004; Ellis et al., 2005; Ellis et al., 2012; Letourneau et al., 2012; Naar-king et al., 2009; Naar-King et al., 2014), psychiatric illnesses (Henggeler et al., 1999; Rowland et al., 2005) and child maltreatment (Brunk, Henggeler & Whelan, 1987; Swenson, Schaeffer, Henggeler, Fladowski & Mayhew, 2010).

## Setting of studies

The 26 studies included were undertaken between 1987 and 2018 and conducted across four different countries. Of the 26 studies included, 21 studies were conducted in the USA (Brunk et al.,1987; Borduin et al., 1990; Borduin et al.,1995; Borduin et al., 2009; Ellis et al., 2004; Ellis et al., 2005; Ellis et al., 2012; Glisson et al., 2010; Henggeler et al., 1992; Henggeler et al., 1996; Henggeler et al., 1997; Henggeler et al., 1999; Henggeler et al. 2006; Letourneau et al., 2009; Letourneau et al., 2012; Naar-King et al., 2009; Naar-King et al., 2014; Rowland et al., 2005; Swenson et al., 2010; Timmons-Mitchell et al., 2006; Wiess et al., 2013) and five studies took place in Europe: in Norway (Ogden & Halliday-Boykins, 2004), Sweden (Asscher et al., 2013 & Sundell et al., 2008) and the UK (Butler et al., 2011; Fonagy et al.,2018).

**Table 1. Summary of Included Study Characteristics**

| Study information (Author, year, title and sample) | Country | Primary outcomes | Comparator arm intervention | Outcomes |
|---|---|---|---|---|
| **1. Asscher et al. (2013)**<br><br>A randomized controlled trial of the effectiveness of multisystemic therapy in the Netherlands: post-treatment changes and moderator effects<br><br>MST n=147<br>MAU n=109<br><br>Conduct problems | Sweden | **Primary outcomes:** were externalising behaviour assessed via: Child Behaviour Checklist (CBCL) (CBCL; Achenbach & Rescorla, 2001), Disruptive Behaviours Disorder rating scales (Oosterlaan et al. 2000) The subscales Oppositional Defiant Disorder (9 items) and Conduct disorder (18 items), Externalizing behaviour problems subscale of the Youth Self Report (Achenbach 1991; Verhulst and Van der Ende 1992), Violent Offending and Property Offending subscales of the Self-Report Delinquency scale (SRD) (Blomand van der Laan 2006) were used to assess self-report delinquency. | **Management as usual:** defined as either: Individual treatment (individual counselling or supervision by probation officer or case manager,) Family-based interventions (family therapy, parent counselling, parent groups, or home-based social services,). Combined care (individual treatment and family counselling), Detention or no care. Intervention frequency and duration were not reported.<br><br>Frequency and duration not reported. | MST significantly more effective in reducing externalizing behaviour (parent and adolescent report); ODD and CD symptoms; self-reported property offences but not violent offences MST parents reported significantly greater increase in sense of competence. |
| **2. Borduin et al. (1995)**<br><br>Multisystemic Treatment of Serious Juvenile Offenders: Long-Term Prevention of Criminality and Violence<br><br>MST n= 92<br>MAU n=84<br><br>Antisocial Behaviour | USA | **Primary outcome:** Records from the Juvenile court, local police, and Department of Public Safety (state police) over a mean of 3.95 years (SD = 1.03; range, 2.04 to 5.41). | **Management as usual:** All of the offenders in this condition received individual therapy which addressed topics such as personal, family, and academic issues. Therapy was integrative and included psychodynamic, and behavioural techniques.<br><br>MAU provided for an average of 45hours in comparison to MST which was provided for an average of 37 hours. | Significant differences between in MST and Individual Therapy in reducing the percentage of violent and nonviolent offending. |
| **3. Borduin, Henggeler, Blaske & Stein (1990)**<br><br>Multisystemic Treatment of Adolescent Sexual Offenders<br><br>MST n = 8<br>MAU n = 8<br><br>Antisocial Behaviour | USA | **Primary outcome:** Offending assessed by rearrest data held by the records of juvenile court, adult court, and the state police. The length of this follow-up ranged from 21 months to 49 months (M = 37 months). Rearrests were classified as sexual or nonsexual. | **Management as usual:** Adolescents were provided individual therapy focused on personal, family and academic issues. The theoretical orientations were a blend of psychodynamic, humanistic and behavioural approaches.<br><br>MAU was provided on average for a significantly longer period of 28.6 hours than MST which was provided for an average of 23.9 hours | Significant differences in MST and management as usual in reducing offending. MST group had recidivism rates of 12.5% of sexual offences and 25% for nonsexual offences. In contrast, the recidivism rates of the Individual Therapy were 75% for sexual offences and 50% for nonsexual offences |

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| **4. Borduin, Schaeffer & Heiblum (2009)**<br><br>A Randomized Clinical Trial of Multisystemic therapy with Juvenile Sexual Offenders: Effects on Youth Social Ecology and Criminal Activity<br><br>MST n=24<br>MAU n=24<br><br>Antisocial Behaviour | USA | **Primary Outcome:** Criminal activity and incarceration assessed via self-report of delinquent behaviour; self report delinquency scale (SRD; Elliott, Ageton, Huizinga, Knowles, & Canter, 1983); Arrests: Criminal arrest data from juvenile office records as well as adult criminal arrest data from a computerized database; Incarceration: Measured as the number of days in Department of Youth Services in a residential facility. | All the adolescents in this condition received a CBT informed group and individual treatment through the local juvenile court.<br><br>Group was 1.5hrs x2 weekly. Individual therapy was offence focused. Individual therapy was 1-1.5hr x 1 weekly.<br><br>The mean length of treatment was 30.1, in comparison to MST which on average was provided for 30.8 weeks. There was no significant difference in duration. | Significant differences in arrests and incarceration. MST reported fewer arrests as a whole, including sexual and other offences, fewer days incarcerated; less self-reported person and property offences on the SRD. |
| **5. Brunk, Henggeler & Whelan (1987)**<br><br>Comparison of Multisystemic Therapy and Parent Training in the Brief Treatment of Child Abuse and Neglect<br><br>MST n = 18<br>MAU n = 17<br><br>Child Abuse and Neglect | USA | **Primary Outcome:** The primary outcome was parent-child interactions. This was measured using observational data and coded using Schaffer and Crooks<br>(1979, 1980) system specifically designed to assess parent control strategies. | **Parent training:** Parent training groups, focused providing psychoeducation on human development and child management techniques. Topics included the use of contingent positive reinforcement, no punitive discipline techniques, parental consistency, negative effects of punitive discipline, and the importance of positive parent-child interactions. Training included developing behaviour management plans to support specific problems or behavioural situations that required modification as identified by the families. Parent training was weekly for 8 weeks and lasted for 1-2 hours per session to match the dose of MST Provided. | Significant differences were found within the observational data where increases in parental effectiveness-action sequences increased in the MST group but not the parent training group.<br>Additionally, child passive non-compliance sequences were also found to significantly decrease for abusive families within the MST group but not for neglectful families in the MST arm or the families in the parent training arm. Significant differences were demonstrated between the groups in relation to parental unresponsiveness. Neglectful families in the MST arm demonstrated significantly reduced unresponsive sequences, whereas no changes emerged for abusive families within this arm or for families in the parent training condition. |
| **6. Butler, Baruch, Hickey & Fonagy (2011)** | UK | **Primary outcome:** Offending assessed via police computer records for rearrests and custodial sentences. Records were also obtained from the National Young | **Management as usual:** Unstandardized range of interventions aimed at preventing re-offending. Interventions were | Significant between group differences in mean number of offences only at 18 months. |

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| A Randomized Controlled Trial of Multisystemic Therapy and a Statutory Therapeutic Intervention for Young Offenders<br><br>MST n = 56<br>MAU n = 52<br><br>Antisocial Behaviour | | Offender Information System (YOIS) database. | multimodal and included educational support; substance misuse services, anger management; skills training; and programs for vehicle-crime, violent-offending and knife-crime awareness. Victim awareness and reparation interventions were also commonly included. Interventions were provided 'as needed' on a 'case-by-case' basis. | No significant differences in custodial sentences where these increased in both groups.<br>Significantly difference between MST group and MAU in reported offending behaviours (SRD). |
| **7. Ellis et al. (2004)**<br><br>Use of Multisystemic Therapy to Improve Regimen Adherence Among Adolescents With Type 1 Diabetes in Poor Metabolic Control: A Pilot Investigation<br><br>MST n = 13<br>MAU n = 12<br><br>Physical Health | USA | **Primary outcome:** Metabolic control was measured via glycosylated hemoglobin (GHb), a measure of average blood glucose over the previous 2 to 3-month period. Adherence was also measured using the Diabetes Management Scale (DMS Schilling, Grey, & Knafl, 2002) | **Management as usual**: Included management by MDT comprised of an endocrinologist, nurse, dietician, social worker, and psychologist. All adolescents were scheduled for visits with the team every 3 months.<br><br>Duration was not reported | MST significantly improved adherence to blood glucose testing and metabolic control in comparison to standard medical care. |
| **8. Ellis et al. (2012)**<br><br>Multisystemic Therapy Compared to Telephone Support for Youth with Poorly Controlled Diabetes: Findings from A Randomized Controlled Trial<br><br>MST n = 74<br>MAU n = 72<br><br>Physical Health | USA | **Primary Outcomes:** Metabolic control was measured via glycosylated hemoglobin (GHb), an indirect and retrospective measure of average blood glucose over the previous 2 to 3-month period. The Diabetes Management Scale (DMS; Schilling, Grey, & Knafl, 2002) | **Telephone Support:** Adolescents received weekly phone calls focusing on diabetes care.<br><br>Treatment included initial home visit then phone calls. Calls focused on providing emotional support specific to diabetes and difficulties with adherence in the previous week, including a review of readings in the blood glucose meter, and identifying solutions to any barriers to effective diabetes care.<br><br>The average number of support sessions provided was 14 over a 4.9-month period, compared to MST where the average number of sessions received was 45.7 over a 5.6 month period. | Adolescents receiving MST had significantly improved metabolic control at post-test and follow up compared to adolescents in telephone support.<br>Parents of adolescents receiving MST reported significant improvements in adolescent adherence. However, adolescent-reported adherence was unchanged |

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| **9. Ellis et al., (2005)**<br><br>Use of Multisystemic Therapy to Improve Regimen Adherence Among Adolescents with Type 1 Diabetes in Chronic Poor Metabolic Control<br><br>MST n = 64<br>MAU n = 63<br><br>Physical Health | USA | **Primary outcomes:** The primary outcome was medication adherence assessed by the twenty-four-hour recall interview. Additional measures of adherence were obtained from the individual's blood-glucose meter. Further measures were obtained through blood samples testing A1C from total glycosylated hemoglobin (GHb) | **Management as usual:** Individuals receiving usual care were managed through multidisciplinary team medical appointments. The team consisted of an endocrinologist, nurse, dietician, social worker, and psychologist.<br><br>Appointments were on a 3-monthly basis. | Individuals in the MST arm demonstrated significant increases in their adherence to blood-glucose testing from baseline to follow up. No significant effects were found for insulin adherence or eating adherence.<br>Significant improvements to metabolic control were observed from baseline to post-test for those in the MST group compared to those in the management as usual group. Additionally, there was a significant treatment x time effect for A1C. |
| **10. Fonagy et al. (2018)**<br><br>Multisystemic therapy versus management as usual in the treatment of adolescent antisocial behaviour (START): a pragmatic, randomised controlled, superiority trial<br><br>MST n = 342<br>MAU n = 342<br><br>Antisocial Behaviour | UK | **Primary outcome:** The primary outcome was the proportion of participants in out-of-home placements at 18 months, chosen by the commissioners of the multisystemic therapy service. | **Management as usual:**<br>Interventions delivered within the management as usual condition were often multicomponent and were delivered by a range of independent services. These included Child and Adolescent Mental Health services, Youth Offending Teams, Education and Social Services.<br><br>Frequency not reported. | No significant differences were found between MST + MAU and MAU in the proportion of participants in out-of-home placement 13% in the multisystemic therapy group vs 11% in the management-as-usual group.<br>No significant differences were detected between multisystemic therapy and management as usual in the time to first offence. Rather the mean number of offences was higher in the multisystemic therapy group than in the management-as-usual group.<br>Adolescents in receipt of MST demonstrated a significant reduction in antisocial cognitions in comparison to those receiving MAU at 6-month; however, this difference diminished on follow up. |

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| **11. Glisson et al. (2010)**<br><br>Randomized Trial of MST and ARC in a Two-Level EBT Implementation Strategy<br><br>MST n = 316<br>MAU n = 299<br><br>Antisocial Behaviour | USA | **Primary outcome:** Youth externalising problems and were assessed using the parent CBCL. | **ARC intervention:** An indirect intervention with mental health providers to support delivery in rural areas.<br><br>ARC followed a manual comprising 12 guided activities sequenced in three stages.<br><br>Over 3 years, the ARC spent 24 hours a week in the field (four hours per county per week) and 12 hours per week in the office | No significant between group differences were observed at 18 months on the CBCL.<br>Those in the MST condition experienced significantly fewer out-of-home placements. |
| **12. Henggeler et al., (2006)**<br><br>Juvenile Drug Court: Enhancing Outcomes by Integrating Evidence-Based Treatments<br><br>Family Court n = 42<br>Drug Court = 38<br>MST + Drug Court =38<br>MST +Drug Court + Contingency Management = 43<br><br>Antisocial Behaviour | USA | **Primary outcomes:** Substance Misuse including alcohol and drug use was the primary outcome. Substance use was measured through self-reports and biological indices. Reported substance use by the adolescent was assessed with the Form 90 (Miller, 1991), | **Management as usual in conjunction with Drug or Family court:** MAU consisted of outpatient substance misuse treatment. Treatment included group for 1.5 hours, 4 days a week for 12 weeks.<br><br>Additionally, individuals were in receipt of 12 weeks of individual therapy and 12 weeks of family group therapy. These interventions were based on cognitive, behavioural and systems theory.<br><br>**Family Court:** Adolescents appeared before Family Court on average once a year.<br><br>**Drug Court:** Adolescents attended Drug court once a week. On attendance urine drug screens were obtained and records on youth behaviour across four domains: drug use, rule compliance, school, and attendance and participation in community services treatment groups was collated. Results were shared with the court and sanctions could be put in place.<br>Clean drug screens were reinforced with incentives. The standard duration of juvenile drug court was 12 months<br><br>Treatment types: FC, DC, DC/MST, DC/MST/CM | Significant between groups differences for urine screens. The drug court and MST condition and the drug courts with MST and contingency management condition had significantly lower positive urine screens than drug court alone.<br><br>On self-report measures Form 90 Drug court and MST condition and Drug court, MST and Contingency Management reported significantly less alcohol, marijuana and polydrug use than those in the Family Court condition. |

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| **13. Henggeler, Melton & Smith (1992)**<br><br>Family preservation using multisystemic therapy: An effective alternative to incarcerating serious juvenile offenders.<br><br>MST n = 43<br>MAU n = 41<br><br>Antisocial Behaviour | USA | **Primary outcome**: Were criminal behaviours and incarceration and was measured via number of arrests and days in incarceration. Data was retrieved from the Department of Youth Services computer records for an average of 60 weeks. Additionally, measures of criminal behaviour were taken via the self-reported delinquency scale. | **Management as usual:** Court mandated stipulations were placed on individuals in management as usual conditions. Probation workers met with the young people monthly to support them to adhere to the stipulations.<br><br>Individuals referred to mental health services, uptake was not recorded.<br><br>No frequency and duration data available for MAU, however MST was provided for an average of 33hrs over 13.4 weeks. | Significant effects were detected in favour of MST for reducing all three measures of criminal behaviour. Those in the MST arm demonstrated significantly lower arrests, spent fewer days incarcerated and youths reported reduced criminal activity on the Self-Reported Delinquency Scale. |
| **14. Henggeler, Melton, Brondino, Scherer & Hanley(1997)**<br><br>Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination<br><br>MST n = 82<br>MAU n = 73<br><br>Antisocial Behaviour | USA | **Primary outcome:** Criminal activity was the primary outcome, and this was measured via arrest data held by the department of juvenile justice. Offences recorded were scored using the Seriousness Index. Additional information regarding criminal activity was gathered through the self-reported delinquency scale. | **Management as usual:** All individuals in management as usual were placed on probation. Whilst on probation they were seen by a caseworker one a month on average. Caseworkers monitored school attendance and referred to additional community services including mental health, substance misuse services vocational counselling or training.<br><br>Placements were arranged for alternative education, however, it is unclear how many individuals were subject to this intervention.<br><br>No information regarding MAU frequency or duration were reported, however, on average those in the MST condition received 17.4 weeks of intervention. | Significant differences were detected between MST and management as usual where MST decreased incarceration by 47% at a 1.7-year follow-up. However, between time one and two no significant differences were observed between the two groups.<br>Additionally, youth reports of criminal activity did not demonstrate significant difference between the youths allocated to MST and management as usual service. |
| **15. Henggeler, Pickrel & Brondino. (1996)**<br><br>Eliminating (almost) treatment dropout of substance abusing or dependent delinquents through home-based multisystemic therapy.<br><br>MST n = 57<br>MAU n = 47 | USA | **Primary Outcome:** Dropout and service utilisation formed the primary outcome. Service utilisation was recorded during monthly calls with the family. | **Management as usual:** Youths in the comparison condition were provided with referrals to outpatient substance abuse services which included attendance at adolescent group meetings that followed a 12-step program or inpatient and residential programs.<br><br>Mental health services were also available to substance-abusing youths, and these | Significant differences between the MST group and management as usual group were found in service utilisation. 98% of individuals in the MST group completed treatment in comparison to the management as usual arm. Within the management as usual arm 78% of families reported no treatment, |

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| Antisocial Behaviour | | | included public and private outpatient, school-based, family preservation, residential, and inpatient services which they would be referred to. Referral allocation not reported.<br><br>75% of individuals in this condition received no treatment. | 7% received mental health treatment only, 10% received substance abuse treatment only, and 5% received both. |
| **16. Henggeler et al. (1999)**<br><br>Home-Based Multisystemic Therapy as an Alternative to the Hospitalization of Youths in Psychiatric Crisis: Clinical Outcomes<br>MST n = 57<br>MAU n = 56<br><br>Mental Health | USA | **Primary outcome:** Young person psychological function was the primary outcome which was measured through a battery of psychosocial measures assessing psychiatric distress, antisocial behavior, and self-esteem. Measures used included: The Global Severity Index of the Brief Symptom Inventory (GSI-BSI) (Derogatis, 1993), The Child Behaviour Checklist (CBCL) (Achenbach, 1991a), the Personal Experiences Inventory (PEI) (Winters and Henly, 1989), Self-Esteem subscale of the Family, Friends, and Self Scale (FFS) (Simpson and McBride, 1992).<br><br>Additionally, any arrests were assessed through search of computerized records from the Department of Juvenile Justice. | **Management as usual:** The management as usual condition consisted of admission to an inpatient youth psychiatric hospital. Within this condition individuals were supported by a multidisciplinary team.<br><br>Interventions to support stabilisation included individuals being part of a behaviourally based milieu program with a point system individualized targeting the behaviours that precipitated admission.<br><br>The average admission was 15.6 days with an average follow up of 8.5hr community support. In comparison, on average adolescents in the MST condition received 123 days (17.5 weeks) of intervention which was estimated to be 97hrs of direct contact. | Significant differences were observed between the MST group and the emergency hospitalization group on the CBCL in both caregiver and teacher report. Those in the MST group demonstrated reductions externalizing symptoms.<br>However significant differences were also observed on the Self-Family, Friends and Self scale, where Hospitalization was more effective than MST at improving self-esteem. |
| **17. Letourneau et al. (2009)**<br><br>Multisystemic Therapy for Juvenile Sexual Offenders: 1-Year Results from a Randomized Effectiveness Trial<br><br>MST n = 31<br>MAU n =36<br><br>Antisocial Behaviour | USA | **Primary outcome:** Problem sexual behaviour was the primary outcome; this was not assessed via recidivism as it was considered that this would be unlikely to be captured in a one-year followup.<br><br>As such two subscales of the Adolescent Sexual Behaviour Inventory (ASBI; Friedrich, Lysne, Sims, & Shamos, 2004) were used to assess inappropriate adolescent sexual behaviours from both youth and caregiver perspectives as well as | **Management as usual:** All individuals receiving usual services were referred for sexual offender-specific treatment<br><br>Individuals in this arm met for sexual offender treatment in groups of approximately 8 to 10 youth for weekly 60-minute sessions.<br><br>The average length of treatment was 14.6 months, in comparison to MST where the average duration was 7.1 months | Significant differences were found between the two groups in self-report of problem sexual behaviour using the ASBI over time. Individuals in the MST demonstrated reduced problem sexual behaviours<br><br>MST youth reported significantly reduced delinquent behaviour on the SRD. |

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| | | general delinquency subscale of the SRD. | | |
| **18. Letourneau et al.,(2012)**<br><br>Multisystemic therapy for poorly adherent youth with HIV: Results from a pilot randomized controlled trial<br><br>MST n = 16<br>MAU n = 14<br><br>Physical Health | USA | **Primary outcome:** Medication adherence as assessed by self-report and biological assessment of viral load and CD4 counts. | **Management as usual:** Usual care plus one session of Motivational Interviewing. Usual care was provided by multidisciplinary team 3 monthly review. Where indicated clinic teams counselled participants regarding medication adherence. | Significant differences were observed between the MST and management as usual + MI group with regards to viral load.<br><br>No significant differences were found between the MST and management as usual + MI in self-reported medication adherence.<br><br>No significant differences were found between the groups in relation to CD4 counts. |
| **19. Naar-King et al. (2014)**<br><br>Multisystemic Therapy for High-Risk African American Adolescents with Asthma: A Randomized Clinical Trial<br><br>Physical Health | USA | **Primary Outcome:** Medication adherence biological measures were also taken and pulmonary functioning was assessed by using forced expiratory manoeuvres obtained with a portable calibrated recording spirometer (KoKo) and forced expiratory volume in 1 s (FEV1) to provide information about actual airflow. | **Family Support:** Family support took the form of weekly home visits aimed to provide the family with empathic support, to discuss barriers to asthma care adherence, and to provide signposting to further support to help aid asthma management.<br><br>The FS intervention was 6 months in length to match MST-HC in length of treatment. However, as the MST session dose is flexible, the dose was not matched in family support.<br><br>Mean length of treatment, excluding dropouts, was 4.20 months and mean number of sessions was 11.03 | Significant differences were observed during intent-to-treat analyses, where individuals in the MST-HC were more likely to demonstrate improved scores on 2 of the measures of medication adherence as well as in the assessment of airflow (FEV1) compared to those in the family support condition. |
| **20. Naar-King et al. (2009)**<br><br>A randomized pilot study of multisystemic therapy targeting obesity in African-American adolescents.<br><br>MST n= 24<br>MAU n =25<br><br>Physical Health | USA | **Primary outcomes**: Weight loss as measured by BMI, percent overweight (percent above age/gender-specific median BMI using CDC growth curves), and percent body fat from bioelectrical impedance analysis. | **Management as usual:** Families within the usual services condition attended “Shapedown” a traditional 10-week family group weight management program with three follow-up monthly sessions added to match MST treatment length. | Significant differences in start weight and end weight were observed in the MST group, where the percent overweight, percent body fat, and BMI all reduced.<br>No significant differences were observed within the management as usual group. |

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| **21. Ogden & Halliday - Boykins (2004)**<br><br>Multisystemic Treatment of Antisocial Adolescents in Norway: Replication of Clinical Outcomes Outside of the US<br><br>MST n = 62<br>MAU n = 38<br><br>Conduct | Norway | **Primary outcomes:** Adolescent behaviour was considered the primary outcome and was assessed using a number of measures from a range of informants. Measures included the Child Behaviour Checklist (CBCL), Self-Report Delinquency Scale (SRD), Social Competence with Peers Questionnaire (SCPQ), Social Skills Ratings System (SSRS), Family Adaptability and Cohesion Evaluation Scales-III (FACES-III) as well as days in Out-of-Home Placement. | **Management as usual:** Usual services offered by Child Welfare Services including home-based treatments including individual child counselling, parent training and promoting involvement in pro-social activities. However, where severity of behaviour was deemed severe individuals were placed out of home | Individuals in the MST arm demonstrated significant reductions in internalising symptoms based on combined caregiver, youth and teacher reports on the Child Behaviour Checklist<br><br>MST group scored significantly lower on self-reported delinquency scale than those in the management as usual condition. |
| **22. Rowland et al. (2005)**<br><br>A Randomized Trial of Multisystemic Therapy with Hawaii's Felix Class Youths<br><br>MST n =15<br>MAU n =16<br><br>Mental Health | USA | **Primary outcome**: Mental health symptomology was considered the primary outcome and assessment incorporated measures of externalising and internalising behaviour using the Child Behaviour Checklist (CBCL; Achenbach, 1991a, b) and the Youth Risk Behaviour Survey (YRBS; Kolbe, Kami, & Collins, 1993). | **Management as usual:** Individuals in the management as usual condition were care co-ordinated. Care co-ordinators assessed the individuals and facilitated the provision of interventions to address specific needs highlighted by assessment. Interventions within this condition included: individual therapy, family therapy, intensive in-home services, medication management, therapeutic foster care, group home treatment, hospital-based treatment or therapeutic aide.<br>Treatment length not reported | Individuals in the MST condition reported significantly greater decreases in CBCL externalizing symptoms and internalizing symptoms at 6 months than their management as usual counterparts. |
| **23. Sundell, Hansson, Löfholm, Olsson, Gustle & Kadesjo, (2008)**<br><br>The Transportability of Multisystemic Therapy to Sweden: Short-Term Results From a Randomized Trial of Conduct-Disordered Youths<br><br>MST n =79<br>MAU n = 77<br>Conduct Disorder | Sweden | **Primary outcome:** Individual mental health was the primary outcome. Youth symptomatology was assessed with caregiver (CBCL) and adolescent (YSR) ratings (Achenbach, 1991a, 1991b). Sense of Coherence (SOC) scale. Youths reported their sense of coherence through a shortened version of the SOC scale (Antonovsky, 1987), self-report delinquency scale (SRD). Youths completed the SRD (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983), alcohol use disorder identification test (AUDIT; Babor, de la Fluente, Saunders, & Grant, 1992), drug | **Management as usual**: Within management as usual individuals were referred to social services where interventions were determined based upon assessment. Most frequently it was determined individual counselling would be most appropriate. Counselling was either provided by the case manager or an independent counsellor, sessions lasted 1-2 hours and was provided on a fortnightly basis.<br><br>Alternative interventions included family therapy, mentorships with non-professional volunteers, out-of-home placement | No significant between group differences observed on the youth symptomology as assessed by the CBCL, SOC and YSR. Furthermore, no differences were observed on the SRD, the AUDIT and DUDIT. Youths in both groups reduced their self-reported delinquency (SRD) significantly and this was corroborated by arrest data that showed 47% of the MST group had been arrested during follow up compared to 49% of the management as usual group. |

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| | | use disorder identification test (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2005) | aggression training, addiction treatment or special education services.<br><br>Treatment length not reported. | |
| **24.Swenson, Schaeffer, Henggerler, Fladowski & Mayhew.(2010)**<br><br>Multisystemic Therapy for Child Abuse and Neglect: A Randomized Effectiveness Trial<br><br>MST n =45<br>MAU n= 45 | USA | **Primary outcome:** It was unclear what exactly what the primary outcome within the study was identified as, despite there being a number of assessments conducted, it is assumed primary outcome was reduction of abuse.<br><br>Child Outcomes: Child Behaviour Checklist (CBCL; Achenbach, 1991), CBCL-PTSD scale (Ruggiero & McLeer, 2000) and Trauma Symptom Checklist for Children (TSCC; Briere, 1989), Parent functioning: Psychiatric distress was measured using the Global Severity Index (GSI) of the Brief Symptom Inventory (BSI; Derogatis, 1975), Parent Outcomes: Parent self-report and youth report of parental behaviour on the Conflict Tactics Scale (CTS; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) Social support: Social support for the parents was assessed by the 40-item Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) , Maltreatment outcome: Reabuse and youth out-of-home placement data were obtained from CPS records. | **Enhanced outpatient treatment and parent training:**<br>EOT included the standard services the Centre provided which included individual or family therapy.<br><br>All participants received a parent training intervention: The Systematic Training for Effective Parenting of Teens (STEP-TEEN; Dinkmeyer, McKay, McKay, & Dinkmeyer, 1998). This intervention ran for approximately seven weeks and provided parents with psychoeducation and problem-solving skills.<br><br>If problems were specific and out of the scope of the centre specialist referrals were made. No information regarding frequency of duration | MST-CAN was significantly more effective than EOT in reducing youth mental health symptoms (CBCL-PTSD; TSCC), parent emotional distress (GSI-BSI), parenting behaviours associated with maltreatment (CTS), youth out-of-home placements, and changes in youth placement. MST-CAN also significantly improved natural social support for parents. (ISEL)<br>No significant differences were found between MST-CAN and EOT with regards to reabuse data |
| **25. Timmons – Mitchell, Bender, Kishna & Mitchell (2006)**<br><br>An Independent Effectiveness Trial of Multisystemic Therapy with Juvenile<br>Justice Youth<br><br>MST n = 48<br>MAU n = 45 | USA | **Primary outcome:** Recidivism was a primary outcome and was assessed by arrest data. Further outcomes considered young person functioning assessed by the Child and Adolescent Functional Assessment Scale (CAFAAS; Hodges, 1994) | **Management as usual:** Study documents limited knowledge of usual services allocation. Of the limited information available, management as usual constituted referrals to drug and alcohol counsellors, anger management groups, and individual and family therapies in both public and private settings. | Recidivism was found to be significantly lower for the MST group than those in the management as usual condition<br><br>No significant difference was observed between the groups in for average time to first arrest or |

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| Antisocial behaviour | | | | percentage of felonies versus misdemeanours<br><br>Significant improvements were observed in the MST groups' scores on four of six subscales in the child and adolescent functional assessment scale. These include school/ work, home, community, moods and emotions. |
| **26. Weiss et al., (2013)**<br><br>An Independent Randomized Clinical Trial of Multisystemic Therapy with Non-Court-Referred Adolescents with Serious Conduct Problems<br><br>MST n = 84<br>MAU n = 80<br><br>Conduct disorder | USA | **Primary outcome:** adolescent conduct problems as assessed by parent, adolescent, and teacher reports on the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001), and criminal charges that were obtained from court records. | **Moderate Intervention Program;** consisted of a behaviourally-focused classroom management plan provided by the school, with educational instruction occurring in self-contained classrooms. | CBCL and YSR: rate of reduction in problem behaviours greater for MST group No significant difference for teacher reported problem behaviour, SRD, drug use, reintegration to mainstream; grades, number of days absent or suspended, family adaptability or cohesion |

## Data Synthesis

### Antisocial Behaviour

Of the 26 studies reviewed, 12 of these focused on the application of MST to antisocial and offending behaviour. Within this, three studies focused upon sex offending (Borduin et al., 1990; Borduin et al., 2009; Letourneau et al., 2009), two on substance misuse (Henggeler et al., 1996; Henggeler et al., 2006) and the remaining seven considered all forms of offending behaviour (Borduin et al., 1995; Butler et al., 2011; Fonagy et al., 2018; Glisson et al., 2010; Henggeler et al., 1997; Henggeler et al., 1996; Timmons-Mitchell et al., 2006;). Studies within this domain varied in their quality, where five were rated as strong (Butler et al., 2011; Fonagy et al., 2018; Glisson et al., 2010; Henggeler et al., 2006; Letourneau et al., 2009), two were rated as good (Borduin et al., 2009; Timmons-Mitchell et al., 2006) and five were rated weak (Borduin et al., 1990; Borduin et al., 1995; Henggeler et al., 1992; Henggeler et al., 1996; Henggeler et al., 1997).

As can be seen in Table 1, across this context, sample sizes were wide ranging, with two studies having under 50 participants (Borduin et al., 2009; Borduin et al., 1990), two under 100 (Henggeler et al., 1992; Timmons-Mitchell et al., 2006), seven over 100 (Borduin et al., 1995; Butler et al., 2011; Henggeler et al., 1996; Henggeler et al., 1997; Henggeler et al., 1999; Henggeler et al., 2006; Letourneau et al., 2012) and two more than 500 (Fonagy et al.,2018; Glisson et al., 2010). Few studies reported that power calculations had been undertaken (Butler et al., 2011; Fonagy et al., 2018; Glisson et al., 2010; Henggeler et al.,1992) and as such it is unclear if samples were large enough to detect effects reliably. Within this sample of studies ten were conducted in the US (Borduin et al., 1990; Borduin et al., 1995; Borduin et al., 2009; Glisson et al.,2010; Henggeler et al., 1990; Henggeler et al., 1996; Henggeler et al., 1997; Henggeler et al., 2006; Letourneau et al., 2009;

Timmons-Mitchell et al., 2006) and two were conducted in the UK (Butler et al., 2011; Fonagy et al., 2018).

**Table 2. Table Summarising Antisocial Studies MAU Conditions and Primary Outcomes**

| | MAU Defined by | | | Significant Result on Primary Outcome * |
|---|---|---|---|---|
| Title | Frequency of contact | Duration of intervention | Modality stated | |
| Borduin et al., 1990 | Y | N | N | Y |
| Borduin et al., 1995 | Y | Y | N | Y |
| Borduin et al., 2009 | Y | Y | Y | Y |
| Butler et al., 2011 | N | Y | N | Y |
| Fonagy et al., 2018 | N | Y | N | N |
| Glisson et al., 2010 | Y | Y | Y | Y |
| Henggeler et a., 1992 | N | N | N | Y |
| Henggeler et a., 1996 | N | N | N | Y |
| Henggeler et a., 1997 | N | N | N | Y |
| Henggeler et a., 2006 | Y | Y | Y | Y |
| Letourneau et al.,2009 | Y | Y | Y | Y |
| Timmons-Mitchell et al., 2006 | N | N | N | Y |

*Note: Significant result on primary outcome refers to outcomes in which MST was favoured*

## Generic Antisocial Behaviour

Where antisocial behaviour was considered the primary problem, most of the studies examined standard MST. The services offered as MAU differed greatly within this context and were provided by a range of services, including judicial, probation and mental health services. Within three of the 12 studies MAU was provided, in part, by local adolescent mental health services (Borduin et al.,1995; Butler et al., 2011; Fonagy et al., 2018), in three it was as provided by judicial services (Henggeler et al., 1992; Henggeler et al., 1997; Timmons-Mitchell et al., 2006) and in the remaining study MAU was provided with support of an organisational intervention (Glisson et al., 2010).

## Mental Health Provision

Across these studies there was a lot of diversity in mental health MAU provision. Borduin and colleagues (1995) conceptualise MAU as being comprised of individual therapy alone. They document the therapeutic aim as addressing, with the

young person, difficulties in domains of personal, academic and family life. Despite this, the mechanism of change was unclear, and the theoretic underpinning of the intervention was not specified. Authors report that therapeutic approaches took the form of a *"blend of psychodynamic, humanistic and behavioural approaches"* (Borduin et al., 1995, p. 571). This provides a limited conceptualisation of MAU, as the degree to which the mechanism of change within psychotherapeutic interventions overlapped with the therapeutic interventions provided in MST is not known. Despite this, the authors specify the delivery format of the intervention and document when this deviated from the planned methodology. Within the individual therapy condition, in rare circumstances, individuals were provided with a multidimensional intervention which included systemic involvement (9.5%) (Borduin et al., 1995, p. 571). This differs greatly from the mental health MAU provided in more recent UK trials, where Butler and colleagues (2011) as well as Fonagy and colleagues (2018) state that mental health provision was provided as one aspect of a broader multidimensional approach. The authors report that such interventions were allocated through assessment by a multi-agency referral panel, comprised of youth offending teams, Child and Adolescent Mental Health Services (CAMHS) and social services. Due to this 'needs basis' approach MAU was not standardised, and the interventions were provided across risk domains. Whilst this provides clinical validity and demonstrates that MAU was provided in line with best practice guidance it must be considered a limitation of both studies. Due to the undocumented diversity, not only is it unclear what was delivered but it is also not possible to replicate. For example, in these conditions it was possible for a young person and their family to receive any combination of interventions that targeted risk factors in all implicated risk domains (individual, family, peers, school and community) associated with offending behaviour. As such, it is likely that interventions provided in MAU were also provided in line with Bronfenbrenner's Social Ecology theory (1979). This is in part due to the socio-political setting where national intervention guidance provided by the national institute

for clinical excellence (NICE) recommends multimodal interventions for this group of young people. NICE specifically comment that interventions must involve the adolescent and their parents with an explicit family focus, including social learning interventions encompassing parent training, attachment interventions and child problem solving.

Borduin and colleagues (1995) and Butler and colleagues (2011) found that MST was more effective than the comparator at reducing recidivism. However, within the assessment by Butler and colleagues (2010) no significant difference between the groups in relation to out-of-home placement were found. Similarly, Fonagy and colleagues (2018) found MST to be no more effective than MAU at reducing out of home placement or recidivism. Here, it appears that the quality of MAU interventions may directly influence outcome of trials, whereas when MAU is multimodal and robust the effect of MST on out of home placement is diminished.

It can be observed in the early studies that when interventions were unidimensional and standardised, mental health provision in MAU is somewhat well defined. Authors comment on the average duration of treatment (Borduin et al., 1995), the delivery format of the intervention (Borduin et al., 1990; Borduin et al., 1995) demonstrating limited risk of contamination between intervention arms (see Table 2). Whilst Fonagy and colleagues (2018) were unable to provide this information they suggest that MAU was "*no less resource-intensive than multisystemic therapy consistent with the young person's complex mental health needs and behavioural difficulties*" (p.123). Due to this all-encompassing approach to MAU it is unclear what was provided, and how much of this unknown entity was delivered. However, the authors do comment that those within the MAU condition received significantly more professional contacts, with significantly more appointments with social workers than those receiving MST. However, it is of note that within this study all participants were ordered to receive MAU following MST, meaning that all participants within the trial were exposed to MAU services.

Overall, it could be concluded that within the more recent trials the mental health component of MAU appears less clearly defined. Beyond stating that MAU was a multicomponent intervention that worked across several systems little is known about the theoretic underpinning of interventions, and the frequency and duration for which they were administered. Whilst clinically these trials represent a more "real life" assessment of MST, the multimodal treatment approach provided is poorly documented. Consequently, it is unclear how discretely different the interventions provided in MST and MAU were, and if leakage of MST principles into usual practice occurred. Inferences that can be made, however, are that when MST was compared to individual psychotherapy it yields positive results, and when provided independently compared to a multimodal intervention it also demonstrates efficacy at reducing recidivism. However, as Mohr and colleagues suggest the question remaining in this context is: "the treatment is more effective compared to what?" (2008, p. 279). Moreover, when this "what" is provided in conjunction with MST, the added value MST provides does not provide significant or clinical change

### Judicial provision

When MAU interventions were provided by judicial and probation services for antisocial behaviour, MAU appeared somewhat consistent (Henggeler et al., 1992; Henggeler et al., 1997; Timmons-Mitchell et al., 2006). Within these studies, two reported that the MAU provision was an individual intervention (Henggeler et al., 1992; Henggeler et al., 1997) and one suggested that interventions were multimodal including individual and group interventions (Timmons-Mitchell et al., 2006). Henggeler and colleagues (1997; 1992) both report that MAU constituted a combination of stipulations imposed by the court and regular meetings with a probation worker. These stipulations aimed to reduce exposure to risk factors by imposing curfews, mandating school attendance and enforcing engagement with other agencies. However, in both studies, it is unclear if these stipulations were

upheld. Henggeler and colleagues (1997) comments that referrals were made to additional services such as mental health, addictions and vocational services but do not report the uptake of such services and what, if any, psychotherapeutic intervention was provided. Despite this, in both studies it is reported that adolescents met with their caseworkers on a weekly to monthly basis to emphasise the importance of adhering to court stipulations. However, it is unclear if there was a specific theoretic modality guiding this work. Within both studies the authors comment, "*if progress was not noted in the case during the probation period, Department of Juvenile Justice had the option of initiating out of home placement*", they do not report the proportion of placements provided, or the remit of such placements (Henggeler et al., 1997, p 823).

Within Timmons-Mitchell and colleagues' (2006) independent efficacy trial the same limitations present, where MAU was referrals to specialist services yet no information regarding the utilisation of these services is documented. However, the authors explicitly address this shortcoming and explain that due to the financial constraints of the trial it was not possible to monitor service utilisation in the MAU condition. Again, this makes it hard to ascertain what, if anything, was administered in this condition.

In all three studies it could be concluded that due to the limited active interventions documented that the MAU condition serves as control arms as opposed to comparators. Within the three studies, beyond stipulations, non-therapeutic meetings and court appearances there does not appear to be a comparable psychotherapeutic intervention provided. When considering the impact this has upon outcome data this is highly influential as this appears to suggest some intervention is better than no intervention but does not speak to the unique value of MST.

**Organisational Intervention**

Within this diagnostic delivery context one study incorporated a specific intervention as the comparator as opposed to MAU (Glisson et al., 2010). Within this

study MST was compared to an organisational intervention: availability, responsiveness and continuity (ARC) to support delivery of both MAU and MST within rural communities. The ARC intervention was delivered to staff providing both MAU and MST. This intervention appears well documented and provides information as to the duration and frequency; however, it is important to note that this was not a direct comparison of MST and MAU but of the impact of ARC in the delivery of these interventions. However, within this delivery context, when supported by ARC, MST was found to be more effective than MAU supported by ARC.

## Specialist Antisocial Problems

Within this category, five of the studies were focused on MST for specialist difficulties such as problem sexual behaviour (Borduin et al., 1990; Borduin et al., 2009; Letourneau et al., 2009) and substance misuse (Henggeler et al., 1996; Henggeler et al., 2006).

## Problem Sexual Behaviour

When MST was evaluated in its application to problem sexual behaviour, MAU was provided by local mental health services in one study (Borduin et al., 1990) and by judicial services in two studies (Borduin et al., 2009; Letourneau et al., 2009). Similar to studies of generic antisocial behaviour Borduin and colleagues (1990) reported that MAU consisted of individual therapy where the theoretic modality was unspecified, as can be seen in Table 1. However, when MAU was provided by judicial service this appears to have been defined in a much more robust fashion. Borduin and colleagues (2009) and Letourneau and colleagues (2009) report the MAU condition with a high level of specificity. Table 2 demonstrates that within this diagnostic delivery context services provided by the justice system were therapeutic interventions and the duration, frequency as well as delivery format was documented. This perhaps representing one of the few MST trials which offer a comprehensive and active MAU with sufficient detail for replication. In both trials, participants were

engaged in a specific sex offender treatment. As noted in Table 1, Borduin and colleagues (2009) conceptualise this as both individual and group therapy informed by cognitive behavioural therapy principles. Similarly, Letourneau and colleagues (2009) describe a group intervention with set aims which were to identify triggers for problem sexual behaviour, increasing the adolescent behavioural control and to develop a relapse plan. In contrast to Borduin and colleagues (2009), individuals were not provided with individual treatment, however, they were supported by probation services and referred to specialist services. These referrals were not reported and therefore it is unclear if a combination of care was provided.

Borduin and their team (2009) highlight that the intervention duration of MAU was matched with the duration of MST, where the MST group received intervention for an average of 30.8 weeks and MAU for 30.1 weeks. It is important to note, however, that due to the nature of MST's unique service delivery it is unclear if they were matched for dose effects given MST offers an "as needed" intervention and the frequency of appointments is neither ascribed, nor documented. In contrast, Letourneau and colleagues (2009) report that the standard service provided to all adolescents consisted of weekly group therapy for an average of 14 months. This is an important consideration, as despite the MAU intervention being provided for approximately double the duration of the MST-PBS it was found to be less effective in reducing recidivism than MST. As in other studies it is unclear if dose effects impacted this; however, this does appear to demonstrate the added value MST provides in this diagnostic delivery context.

### Substance Misuse

Studies which assessed MST's efficacy in reducing substance misuse (Henggeler et al., 1996; Henggeler et al., 2006) report that MAU was provided by judicial and probation services. Henggeler and colleagues (1996) provide limited information outlining the treatments arms of the study. The only information reported

about MAU is that adolescents were referred to regular services where it was expected that they would take part in a “12 steps program” or more restrictive interventions (residential or inpatient services). The authors do not comment on the allocation of such services. However, as their aim was to assess drop-out they do comment on service utilisation. However, those in the MAU condition largely did not receive substance misuse services. In fact, 75% of those in the MAU condition received no intervention at all.

In contrast, Henggeler and colleagues (2006) comprehensively report the MAU conditions provided by Family Court and Drug Court as documented in Table 1. Within this assessment of MST, MAU was separated into two conditions: MAU provided by Family Court and MAU provided by Drug Court. When MAU was provided by Family Court the documented services appear to be less intensive. Individuals were required to appear in family court either once or twice a year and were referred to attend a drug and alcohol programme in contrast to drug court which took place once a week. The drug and alcohol programme was delivered by state services and was multimodal: with multiple delivery formats across several systems including individual therapeutic interventions, two distinct group interventions with delinquent peers as well as a therapeutic family group delivered intervention.

Similarly, where MAU was provided by Drug Court the same state service intervention was provided. However, within this condition attendance at Drug Court occurred once a week and, on each attendance, adolescents were required to provide urine samples as well as complete measures assessing compliance, behaviour and engagement with treatment programmes. In this condition clean drug screens were reinforced by the court with incentives and rewards. Conversely, where drugs screens and reports of behaviour and engagement were negative, the judge could impose sanctions including community service or in severe cases detention in a youth offending facility.

Within this study MST was provided in conjunction with Drug Court condition and was further evaluated against an enhanced condition where MST + Drug Court was supported by a contingency management intervention. Concerning outcome, youths in the MST with Drug Court condition and MST, Drug Court and Contingency Management conditions report significantly less alcohol and marijuana use than those in the Family Court condition. Within the Drug Court conditions those in receipt of MST submitted significantly greater clean drug samples than those in the Drug Court plus MAU condition. This suggests that MST was more effective than MAU at reducing substance misuse. Within this study the interventions are described in enough detail to conclude that MST provided added value. It is important to note that in this study the MAU is a multimodal intervention designed to target known risk factors proven to contribute to risky behaviours in line with best practice guidance and therefore suggested that MST adds value to current practice.

## Conduct Disorder

Four of the reviewed studies considered the application of MST to conduct disorder. Studies within this diagnostic delivery context varied in their quality, where one was study rated as strong (Sundell et al., 2008) and three were rated as good (Asscher et al., 2013; Ogden & Halliday-Boykins, 2004; Wiess et al., 2013). All studies assessing conduct disorder held samples greater than 100 participants. No studies within this context reported undertaking power calculations, and therefore it is unclear if they were sufficiently powered to detect effects. In all four studies MST was compared to MAU conditions (Asscher et al., 2013; Ogden & Halliday-Boykins, 2004; Sundell et al., 2008; Weiss et al., 2013).

**Table 3. Table Summarising Conduct Disorder Studies MAU Conditions and Primary Outcomes**

| Title | MAU defined by | | | Significant result on Primary Outcome |
|---|---|---|---|---|
| | Frequency of contact | Duration of intervention | Modality | |
| Asscher et al., 2013 | N | N | N | Y |
| Ogden & Halliday-Boykins, 2004 | N | N | N | N |
| Sundell et al., 2008 | N | N | N | N |
| Weiss et al., 2013 | Y | Y | Y | Y |

*Note: Significant result on primary outcome refers to outcomes in which MST was favoured*

When MST was evaluated against MAU in relation to conduct disorder, MAU was provided by a range of services including judicial services, education services and welfare services including the involvement of local mental health teams. It is important to note that in this diagnostic delivery context, where MST was assessed in its application to conduct disorder, three studies were conducted in Europe (Asscher et al., 2013; Ogden & Halliday-Boykins, 2004; Sundell et al., 2008) and one was conducted in the US (Wiess et al., 2013). Both Asscher and colleagues (2013) and Sundell and colleagues (2008) describe MAU in Sweden consisting of local mental health services in conjunction with the courts. They report that interventions were either individual treatment, family interventions or a combination where individuals received multimodal interventions (See Table 1 for further detail). Asscher and colleagues (2013) report that most participants in the MAU arm received a family intervention (53%) and up to 14% did not receive any intervention at all. In contrast, Sundell and colleagues (2008) report that the most frequently delivered intervention was individual counselling (31%) and family therapy was offered less frequently (25%). In both studies reports regarding the frequency, intensity and duration of interventions are limited. Sundell and colleagues (2008) do report the frequency of intervention delivery, however, this is limited to individual counselling which was provided for 1–2 hours on a fortnightly basis. However, information with regard to the intensity or duration of other interventions offered, or combination interventions, was

not reported in either study. Moreover, Sundell and colleagues (2008) report that 25% of the MAU did not complete treatment as it was *"prematurely interrupted"* (p.553). For this reason, it is unclear what service was provided to those within the MAU condition in either Swedish study.

Ogden and Halliday-Boykins (2004) also compared MST to MAU for conduct disorder, however within Norway children are not arrested nor prosecuted and therefore services were largely provided by child welfare agencies. MAU within this study was poorly defined stating only that the intervention could include residential placement or homebased interventions including social services, individual counselling or parent training. The authors did not report the proportions allocated to each service, and nor did they report the frequency or duration of interventions. It is important to note that in this condition interventions were homebased, and worked with the individual, their parents as well, to foster interests in prosocial activities away from delinquent peers. It is therefore unclear if this intervention overlaps with MST.

In contrast, Wiess and colleagues (2013) provide MAU which is specific and standardised. Within this study the sample is derived from self-contained behaviour intervention classrooms and therefore MAU consisted of remaining in the class where behaviour management plans were used. This is distinct from other studies as the authors explicitly report that across treatment arms participants were engaged in a behavioural intervention to some degree, whether this was directly or indirectly. Despite this, little is known about the content of these plans. As in most studies, a notable limitation is the lack of detail pertaining to treatment duration; like previous studies, it is unclear if the MAU intervention was matched to the MST intervention.

Outcomes pertaining to conduct disorder differed, making it hard to compare efficacy. Despite this, all studies in this diagnostic delivery context included a measure of child externalising behaviour; however, outcomes across this domain demonstrated mixed efficacy in MST's ability to reduce externalising behaviour.

Asscher and colleagues (2013), Ogden and colleagues (2004) and Wiess and colleagues (2013) report that MST significantly reduced externalising behaviours in comparison to MAU when behaviours were reported by parents. However, Ogden and colleagues (2004) suggested that whilst this difference was statistically significant this was marginal, and it is remains unclear if this difference was clinically significant. Sundell and colleagues (2008) report that no significant differences were found between MAU and MST conditions in relation to externalising behaviours. In fact, it was noted that 47% of youths in the MST group were arrested by the police during the follow up period in comparison to 49% of the MAU group. Despite this, in both conditions there was approximately a 20% reduction in arrest rates in both groups compared to the 6-month period preceding the trial. Most importantly, within this assessment of MST there was no significant difference in the number of adolescents placed in out of home placement across the treatment arms speaking to the value of MST as a "family preservation model" where it is able to support families remain together and prevent out of home placement through offering support to families improving their patterns of relating, within socio-political contexts with robust social care services. Furthermore, where measures of externalising behaviours were obtained from teachers, they were not found to be significantly different (Wiess et al., 2013). Again, it is important to acknowledge that results within this diagnostic delivery context were mixed and little is known about the comparator offered within MAU conditions. Moreover, when considering the role of socio-political context, we see differing outcomes emerging from within the same cultural context. Whilst limited information is available about the MAU provision in this context, what is known is that allocation of interventions differed.

## Psychiatric Illness

In the case of psychiatric illness, the two studies focused on MST's ability to improve youth functioning and reduce psychiatric symptomatology through a range

of measures. Studies within this diagnostic delivery context held 'good' quality (Henggeler et al., 1999; Rowland et al., 2005). The sample size differed in this service delivery context, where one study held a sample of over 100 participants and the other under 50. Only one of the studies reported power calculations (Rowland et al., 2005). Within this study the authors report limited power, identifying that the study was only powered to detect medium effects. Rowland and colleagues (2005) compared MST to MAU provided by local mental health services and Henggeler and colleagues (1999) compared MST to acute psychiatric admission. These studies provide differing levels of detail with regard to the comparator intervention.

**Table 4. Table Summarising Psychiatric Illness Studies MAU Conditions and Primary Outcomes**

| | MAU defined by | | | Significant result on Primary Outcome |
|---|---|---|---|---|
| Title | Frequency of contact | Duration of intervention | Modality | |
| Henggeler et al., 1999 | Y | Y | Y | N |
| Rowland et al., 2005 | N | N | N | Y |

*Note: Significant result on primary outcome met refers to outcomes in which MST was favoured*

Rowland and colleagues (2005) do not document actual service delivery within the trial. They conceptualise MAU as a robust intervention arm where adolescents were assessed, and intervention was provided based on presenting need. The authors described the scope of the MAU condition, stating that the range of possible interventions included individual therapy, family therapy, intensive home services, medication, therapeutic foster care, specialist residential placements, hospitalisation or a combination of any of these interventions, however, they do not report uptake. Whilst this presents a comprehensive MAU condition tailored to the need of the individual, the poor documentation makes it hard to ascertain what was delivered. This presents a limitation, as not only is this not replicable, but due to the inclusion of homebased family, school and individual intervention it is hard to see how this intervention is discrete from MST.

In contrast, Henggeler and colleagues (1999) compare MST to hospitalisation for adolescents with psychiatric illness. Within this the comparator arm is well defined, and where overlap between intervention arms is possible this is explicitly discussed. Authors acknowledge the risk of overlap in treatment arms should individuals in receipt of MST require acute hospitalisation and set out clear contingencies. Despite this, follow up studies indicate that up to 40% of the MST arm required hospitalisation and therefore results must be considered tentatively (Huey et al. 2004)

Both studies utilised measures of internalising and externalising symptoms; within both studies MST was found to be significantly more effective than the comparator at reducing externalising symptoms. However, where internalising symptoms were considered, MST was found to be no more effective than hospitalisation. In fact, hospitalisation was found to be more effective than MST at improving adolescent self-esteem (Henggeler et al., 1999). In contrast, Rowland and colleagues (2005) suggest that when compared to usual services in Hawaii, MST was more effective in reducing internalising as well as externalising symptoms. Here, mixed efficacy results are presented when considering the same outcome measure for the same presenting problem; however, within this the comparator differs significantly and it is possible that results presented by Henggeler and colleagues (1999) were cofounded by the high admission rate of MST participants.

## Healthcare

As MST has been adapted to span several service delivery contexts, six studies reviewed considered MST's efficacy when transported into physical healthcare settings. Of these six studies, three studies focused on the application of MST to type 1 diabetes (Ellis et al., 2004; Ellis et al., 2005; Ellis et al., 2012), one considered MST for HIV (Letourneau et al., 2012), one focused on MST for asthma (Naar-King et al., 2014) and the last considered MST as a treatment for obesity (Naar-King et al., 2009). Studies within this service delivery context varied in their quality, where two were

rated as strong (Ellis et al., 2012; Naar-King et al., 2014) and four were rated as good (Ellis et al., 2004; Ellis et al., 2005; Letourneau et al., 2012; Naar-King et al., 2009).

Sample sizes in the healthcare context were wide ranging, with three studies having under 50 participants (Ellis et al., 2004; Letourneau et al., 2012; Naar-King et al., 2009) and three over 100 (Ellis et al., 2012; Ellis et al., 2005 Naar-King et al., 2014). Few studies within the healthcare context stated that power calculations had been undertaken (Ellis et al., 2005; Ellis et al., 2012; Naar-King et al., 2009) and as such it is unclear if samples were large enough to detect effects reliably. One study explicitly stated that the sample was not large enough to power between-subjects analyses (Naar-King et al., 2009).

**Table 5. Table Summarising Healthcare Studies MAU Conditions and Primary Outcomes**

| | MAU Defined by | | | Significant Result on Primary Outcome * |
|---|---|---|---|---|
| Title | Frequency of contact | Duration of intervention | Modality | |
| Ellis et al., 2004 | Y | Y | Y | Y |
| Ellis et al.,2005 | Y | Y | Y | Y |
| Ellis et al.,2012 | Y | Y | Y | Y |
| Letourneau et al., 2012 | Y | Y | Y | Y |
| Naar-King et al., 2009 | N | Y | Y | Y |
| Naar-King et al., 2014 | Y | Y | Y | Y |

*Note: Significant result on primary outcome refers to outcomes in which MST was favoured*

In the context of diabetes, the primary outcomes were metabolic control and adherence measured by a combination of biologic blood samples, self-report adherence measures and blood glucose monitor records. Within these three studies MAU appeared consistent (Ellis et al., 2004; Ellis et al., 2005); however, one study provided an enhanced MAU which incorporated weekly supportive phone-calls (Ellis et al., 2012). The standard MAU across all three studies was general medical management provided by a multidisciplinary team (MDT). In all the MAU, and MAU+, conditions individuals were seen every three months for an MDT medical

appointment. Where Ellis and colleagues (2012) provided enhanced MAU, they report providing an initial home-visit to discuss current difficulties in adhering to medications. Following this, phone-call sessions were provided on a weekly basis for a duration of approximately 30 minutes. The reported aims of the intervention were to provide emotional support whilst identifying barriers to treatment and problem solve solutions. The authors note there were no restrictions placed on the content discussed during sessions, and it is therefore possible that the content of such discussion overlapped with the target areas in which MST focuses its intervention such as school, peers and family relations. The modality of this intervention was not specified.

In all studies MST-Healthcare (MST-HC) was found to be more effective than MAU at increasing metabolic control and blood glucose monitoring. However, within these studies the issue of comparator quality continues to arise. MAU within the healthcare context, and most specifically in studies by Ellis and colleagues (2005; 2004), does not appear to include a psychotherapeutic element. Here, as in the studies for youth offending, it appears that outcomes indicate that a therapeutic intervention is better than no therapeutic intervention. When MAU was provided in conjunction with telephone support (Ellis et al., 2012) MST was provided with a platform to demonstrate its added value, where MAU may be considered a comparator as opposed to a control condition. However, it is important to acknowledge that within this condition the average number of phone consultations was only 14 over a 4.9month period, in comparison to an average of 45.7 MST-HC sessions over a duration of 5.6months. As the interventions were not matched in terms of duration or frequency, it is unclear if dose effects played a role in outcomes. Despite this, MST was found to be no more effective than MAU and telephone support at increasing self-reports of medication adherence.

Other studies considered the application of MST-HC for youth obesity, which consisted of a family weight loss group (Naar-King et al., 2009). MAU in the context

of obesity was well defined in terms of delivery format, therapeutic modality, frequency and duration, as documented in Table 5. MAU included psychoeducation and behavioural activities targeted towards weight loss and was provided on a weekly basis for a period of 10 weeks. Upon completion “follow-up” sessions were provided monthly for three months to match the duration of the MST intervention. The authors comment that within the MAU condition, not one family completed the intervention in its entirety, with the average session attendance being 84%. In contrast, those in receipt of MST attended an average of 1.4 sessions a week for the six-month period. Within this study primary outcomes were reductions to the percentage overweight, body fat and body mass index (BMI). Those in receipt of MST-HC experienced significant reductions to all three primary outcomes in comparison to those in the MAU where effects were not observed. It is of note that this represents a trial where MST has been compared to a best practice intervention which works across multiple systems including family systems, peer systems and the individual. However, it must be acknowledged that within this study, due to the small sample size and limited power, it was not possible to perform between-groups analyses, therefore results must be considered tentatively.

When MST-HC was applied to asthma the comparator condition was not MAU. Instead it was a discrete family support intervention that aimed to control for non-MST specific treatment factors (Naar-King et al., 2014). It did so by providing an active multimodal intervention in the family home and was matched to MST-HC in terms of duration. The aims of the family support intervention were clearly specified by the authors. In each weekly session families received empathic support, opportunities to discuss barriers to effective management and signposting external sources of support through Rogerian counselling. It is important to note that whilst families were able to discuss other issues, unlike in the MST intervention, the therapist did not engage in problem solving nor did they teach skills. In comparison

to other trials this is a strength of this paper, as it demonstrates the differences between the comparator and MST-HC arm. It comments that whilst providing a multimodal intervention there was not overlap between the interventions. This is important when considering outcomes, as even those who received a minimum dose of MST-HC demonstrated a significant improvement on lung functioning and adherence to medication, suggesting that even when non-specific factors are controlled for MST, HC appears more effective than alternative family and home-based interventions for asthma.

When MST-HC was assessed in the service delivery context of adolescent HIV the comparator group was an enhanced MAU condition (Letourneau et al., 2012). MAU consisted of three-monthly visits MDT review supplemented with one Motivational Interviewing (MI) session. In severe cases of medication non-compliance, these reviews were held more frequently, and in exceptional circumstances home visits were arranged. The focus MI was to support medication adherence and, where appropriate, drug use or risky sexual behaviour. The MI session was incentivised, and transportation costs were paid to ensure equity of access to the psychotherapeutic intervention. Letourneau and colleagues (2012) report high completion rates across both treatment arms; only one participant did not receive the intervention. Primary outcomes were biologic measures of viral load and C4D counts: a measure of white blood cells, as well as self-reported adherence. Across the course of the intervention change in viral load slopes between MST and Enhance MAU condition were significantly different, indicating that both interventions caused a significant reduction in viral load; however, those in the MST condition were subject to significantly greater reductions. Outcomes related to C4D counts and self-reported adherence were less clear. Whilst significant differences were observed over time for both outcomes, where C4D counts reduced significantly and adherence reports increased significantly no significant differences were observed between the

groups. As such, MST was more effective at reducing viral load but no more effective than MAU at reducing C4D counts or increasing medication adherence.

## Child Maltreatment

Two studies reviewed examined MST for Child Abuse and Neglect (MST-CAN), particularly (Brunk et al., 1987; Swenson et al., 2010). Of the two studies within this context one was rated strong (Swenson et al., 2010) and the other weak (Brunk et al., 1987)

**Table 6. Table Summarising Child Maltreatment Studies MAU Conditions and Primary Outcomes**

| | MAU defined by | | | Significant Result on Primary Outcome* |
|---|---|---|---|---|
| Title | Frequency of contact | Duration of intervention | Modality | |
| Brunk et al.,1987 | Y | Y | Y | N |
| Swenson et al., 2010 | Y | Y | N | N |

*Note: Significant result on primary outcome refers to outcomes in which MST was favoured*

Across the two studies the comparator groups were different, BRUNK1987 present an assessment of MST-CAN in comparison to a parent training program whereas Swenson and colleagues (2010) compare MST-Child Abuse and Neglect (MST-CAN) to enhanced MAU. Brunk and colleagues (1987) reported that the comparator intervention was matched to MST in terms of duration and ran for a period of eight weeks. Like other studies, the authors reported that it was not possible to match for dose effects due to MSTs flexible nature. The parent training intervention was a structured behavioural group which provided psychoeducation, the importance of positive parent-child interactions and developing a tailored behaviour management plan.

In contrast, Swenson and colleagues (2010) compared MST-CAN to an enhanced MAU condition. Within this condition all parents were enrolled in the

Systematic Training for Effective Parenting of Teens (STEP-TEEN; Dinkmeyer, McKay, McKay, & Dinkmeyer, 1998) as part of the MAU provision. This is a seven-session programme focused on enhancing parent-child relations. In addition, MAU services were provided as part of intervention pathways tailored to the individual family, where tertiary referrals were made to specialist services for either the child (mental health 70% or substance misuse 14%) or parent (mental health 28% or substance misuse 6%). To support engagement the MAU condition was enhanced by additional support from the service providers beyond usual practice parameters, such as allowing families to reschedule missed appointments and providing them with phone-call reminders and travel vouchers. Unlike the intervention provided by Brunk and colleagues (1987), Swenson and colleagues (2010) did not match the intervention's duration, however, service provision did not differ significantly between the two groups. Those in receipt of the enhanced MAU received an average of 76 hours of intervention and those in receipt of MST received an average of 88 hours. However, treatment completion rates differed and were significantly lower in the enhanced MAU condition compared to the MST, with rates of 83% and 98% respectively.

Within both studies, significant reductions of adolescent psychiatric symptoms were observed for those in the MST arm of the trial. Within the study by Brunk and colleagues (1987), parents demonstrated significant global psychiatric symptom decreases. This was echoed by Swenson and colleagues (2010), where both MAU and MST parents demonstrate significant reductions in psychiatric symptoms; however, this reduction was greatest in the MST group. Moreover, youths in both conditions demonstrated significant reductions in PTSD and depressive symptoms. This reduction was also significantly greater in the MST-CAN condition. Despite proving beneficial in the reduction of mental health symptoms MST was found to be more effective than MAU at reducing re-abuse.

# Discussion

The purpose of the current review was to examine the degree to which comparator interventions have been conceptualised within the MST literature, expanding upon previous research by encompassing studies evaluating MST across all its current delivery contexts (e.g. healthcare, mental health care, antisocial behaviour and child maltreatment). It aimed to consider the role of MAU conditions, recognising that inappropriate comparator conditions contribute to the overestimation or diminishing of the value of new and potentially useful treatments (Moher et al., 2008). It intended to build upon previous reviews which have identified comparator conditions as a risk to internal validity by conceptualising what these comparators consisted of and considering the impact that these comparators may have on efficacy outcomes.

When MST was evaluated against a comparator arm for difficulties with antisocial behaviour, problem sexual behaviour, substance misuse, psychiatric illness, conduct disorder, chronic health complaints and child maltreatment, relative outcomes were mixed. Across and within these service delivery contexts comparator services were diverse and were often defined as MAU. However, across and between these broad service delivery settings (e.g. physical health, mental health, conduct disorder, antisocial behaviour and child maltreatment) what was provided under the umbrella of MAU was varied. MAU conditions were provided by a range of different agencies located in several organisational contexts and consequently took various formats. These ranged from services providing no intervention, non-therapeutic interventions, individual interventions and multimodal interventions: please see Table 7.

**Table 7. Summary Table Demonstrating the Frequency of Specific Comparator Conditions**

| Application Domain | Comparator Intervention Delivery Format | | | | | | |
|---|---|---|---|---|---|---|---|
| | One to one Intervention | Group Intervention | Multimodal Intervention* | Medical Review | Detention/Admission /Placement | Indirect | No active intervention |
| Antisocial Difficulties | 2 | | 7 | | | 1 | 2 |
| Conduct Disorder | | | 3 | | | 1 | |
| Psychiatric Illness | | | 1 | | 1 | | |
| Healthcare | 2 | 1 | | 3 | | | |
| Maltreatment | | 1 | 1 | | | | |

*Note: Multimodal intervention included all MAU conditions in which the intervention included more than one form of management, except for those interventions which included medical review – all multimodal interventions included more than one psychotherapeutic approach however may have included detention; though this was not the primary intervention*

Within the sample of studies pertaining to MST's application to antisocial behaviour vastly differing results were found. This variation extended into studies focused on conduct disorder where objective offending data was not a primary outcome. It is important to highlight that it is in the application of MST to antisocial behaviour and conduct disorder that MAU provision was the most varied. It is of note that where the presenting problem was considered conduct disorder, most studies were conducted in European contexts, and therefore it is unclear if the robust nature of MAU was as a result of the presenting difficulty or due to the socio-political setting. Studies assessing MST's efficacy within this diagnostic delivery context had the largest range in publication date, ranging from 1990 until 2018. This is important as it is likely that MAU conditions have evolved over this time, and therefore results achieved in advance of usual service improvements do not reflect MST's comparative effectiveness presently. Several studies within this diagnostic delivery context were published prior to the CONSORT guidelines and therefore the quality of reporting varied: please see Table 8 (Strong n=6, Good n=5, Weak n=5). As highlighted in Table 7, MAU conditions for these presenting problems appeared to be either unidimensional in nature: focused only on providing individual therapeutic interventions to the adolescents or providing court stipulations with the aim of altering the adolescent's behaviour, or multimodal systemic interventions where it appeared there may have been leakage of MST principles to the MAU arm, as interventions appeared embedded in all risk-domains of the adolescent's life. Additionally, where interventions were multimodal the impact MST yields appears to diminish. Andrews and colleagues (2006) and Loftholm and colleagues (2013) have previously emphasised the role of multimodal interventions in efficacy data for this reason. Within the MST literature it can be observed that the effects of MST are influenced by comparators improving in quality: where the use of alternative multimodal approaches

as comparators has resulted in smaller effect sizes: please see Table 8. Further to this, it is important to acknowledge that due to MSTs widespread recommendation in governmental guidance internationally, there appears to be uptake of the underlying mechanisms of MST into usual services. As such, it is likely that due to the promotion of MST and its underlying principles usual practice has adapted to incorporate the tenants of MST.

Where MST was assessed in the context of psychiatric illness and compared to MAU (Rowland et al., 2005) or hospitalisation (Henggeler et al., 1999) mixed effects were observed. Whilst MST was found to be slightly more effective than comparators in reducing externalising symptoms, hospitalisation was found to be more effective than MAU at reducing internalising symptoms and increasing youth self-esteem. However, results from Henggeler and colleagues (1999) must be considered tentatively, as it is possible results were confounded due to overlap in the treatment arms. Follow up studies indicated that over 40% of participants in the MST arm of the trial required hospitalisation during the treatment duration (Huey et al. 2004). This means that nearly half of the MST sample received both MAU and MST interventions, and the discrete benefits of either arm cannot truly be assessed. Moreover, due to the high rate of admission within the MST sample it may be possible to infer contrary outcomes, as despite MST proving more effective at reducing internalising and externalising behaviours, it was unequivocally demonstrated to be inadequate when promoted as an alternative to psychiatric admission (Henggeler et al., 2005).

In all studies assessing MST's application to physical health complaints, MST-HC was found to be more effective than MAU at achieving the primary outcome. This was the case when applied to metabolic control, obesity, lung function and viral load. However, in four out of five studies where MST-HC was evaluated for increasing medication adherence it was found no more effective than MAU. Within the healthcare context only four comparators included an active psychotherapeutic intervention.

However, as documented in Table 8, studies within this organisational setting defined comparators well, including reports of their frequency, duration, intensity and the theoretical underpinning. Though these interventions were significantly less intensive than MST-HC, offering either an isolated psychotherapeutic intervention (Letourneau et al., 2012), ten sessions of a group intervention followed by monthly sessions to match the intervention length of MST-HC (Naar-King et al., 2009) or 14 supportive calls (Ellis et al., 2012) in comparison to an average of 6 months of MST-HC. One study provided an active multimodal intervention that aimed to control for non-MST-HC specific factors by providing a homebased family intervention that directly considered the challenges of chronic illness (Naar-King et al., 2014). As such, when considering the service delivery context of physical health, it is important to acknowledge that where MAU conditions provided psychotherapeutic interventions MST has demonstrated some added value, but these largely do not control for dose effects. In all healthcare studies the comparator intervention was provided at a significantly lower frequency than the MST condition.

Furthermore, outcomes regarding MST's utility within the physical health context do not provide information about the long-term benefits and were often conducted on small samples making it hard to conclude if MST should be considered a best practice intervention for such difficulties. All studies assessing MST-HC were conducted in the USA. Given the mixed efficacy results when MST for antisocial behaviour has been transported outside this cultural context, it is important to consider the influence that socio-political context may have had upon outcomes in context and the availability of active MAU conditions. This is particularly pertinent when transportation to UK contexts is considered, as within the UK there is currently a national drive to embed psychological care in the management of long-term and chronic health conditions (Naylor et al., 2012).

When MST-CAN was evaluated in relation to child maltreatment it was found to be more effective upon almost all outcomes when compared to MAU interventions. However, it did not demonstrate benefit on ultimate outcome of re-abuse. MST-CAN resulted in significant reductions in adolescent mental health symptomology, abusive and neglecting parental behaviours as well as improving parent child interactions as measured through observation. However, where objective data related to re-abuse rates was obtained MAU was found to be equally effective at reducing incidents of further abuse. This is of note, as whilst MST demonstrated additional benefit with regards to mental health symptoms and parent-child interactions, where ultimate outcome is considered MST was no more effective (Brunk et al., 1987; Swenson et al., 2010). Here, it could be considered that usual services provide "good enough" service and enable family preservation, however, MST provides added value by enhancing relations and addressing the outcomes of prior abuse.

In this service delivery context (e.g. child maltreatment), comparator interventions were reported as unidimensional often working exclusively with the parents or guardians. In both studies the authors suggest tertiary referrals were made but uptake of these services remained undocumented, and therefore it is unclear if a multimodal approach was provided. A strength of the literature within this service delivery context was the trial structure where the duration of comparator intervention did not differ significantly and therefore did not confound the results. However, as in other service delivery contexts, the issue of dose effects continues to arise due to the flexible delivery of MST and limited reporting of the actual frequency and intensity that MST-CAN was delivered.

Across the body of literature there are significant limitations in the conceptualisation of comparators. Across all delivery contexts (e.g. physical health, mental health, conduct disorder, antisocial behaviour and child maltreatment) reports are limited, and information pertaining to comparator interventions is not provided in

enough detail to allow meaningful interpretations to be made or to enable replication, further contributing to the widespread replicability crisis found within psychological research.

**Table 8. Summary of Study Key Characteristics**

| | Study Quality | Primary Outcome | Effect Size for Primary Outcome | Publication date in relation to CONSORT Guidance | Frequency of Comparator Intervention | Frequency and duration of MST |
|---|---|---|---|---|---|---|
| **Antisocial behaviour** | | | | | | |
| Borduin et al.,1990 | Weak | Recidivism | Small | Pre | Weekly individual therapy amassing an average of 28 hours. | Mean of 23.9 hours of MST |
| Borduin et al.,1995 | Weak | Recidivism | Small | Pre | Weekly individual therapy amassing an average of 45 hours | Mean of 37 hours of MST |
| Borduin et al.,2009 | Strong | Recidivism | Small | Pre | Multimodal intervention including twice weekly group intervention and weekly individual therapy with a mean intensity of 135 hours of treatment | MST provided for a mean of 30.8 weeks, actual frequency not reported and therefore hours unknown. |
| Butler et al., 2011 | Strong | Recidivism | Small | Post | Multimodal intervention from Youth Offending Teams with an average of 21 hours of contact over a six-month period. | MST provided for a mean of 20.4 weeks, number of sessions not reported however results indicated those in the MAU condition received greater intensity of provision |
| Fonagy et al., 2018 | Strong | Recidivism | Insignificant | Post | Multimodal intervention provided by a number of agencies, including CAMHS, YOT and Social Work however the frequency and duration of intervention is not documented. | MST was provided on average three times a week for 3 to 5 months. |
| Glisson et al., 2010 | Strong | Recidivism | Not reported | Pre | ARC indirect intervention delivered to mental health providers. | MST delivered for an average of 15 weeks |
| Henggeler et al.,1992 | Weak | Recidivism | Small | Pre | No psychotherapeutic intervention, court stipulations were provided and emphasised monthly during meetings with probation worker. | MST was provided for an average of 33 hours over 13.4 weeks. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Henggeler et al.,1996 | Weak | Recidivism | Insignificant | Pre | No psychotherapeutic intervention | The duration and frequency of MST were not reported |
| Henggeler et al.,1997 | Weak | Recidivism | Small | Pre | No psychotherapeutic intervention provided, however court stipulations and alternative provided including detention. No frequency or duration of intervention was provided. | MST was provided for an average of 17.4 weeks; however, the frequency was not reported |
| Henggeler et al.,2006 | Strong | Recidivism | Small | Pre | Drug) or family court plus parole for 24 hours over the course of 12 months, attending a 12-week group that met for a total of 72 hours, 12 hours of individual therapy, 36 hours of family therapy and six week group that met for 18 hours regarding drug selling. | MST was provided in the Drug Court plus MST condition for an average of 66hrs over the period of 4 months |
| Letourneau et al., 2009 | Good | Recidivism | Insignificant | Pre | CBT informed non-manualised sex offender treatment group, provided for an average period of 14.2 months | MST provided for an average period of 7.1 months |
| Timmons-Mitchell et al., 2006 | Good | Recidivism | Small | Pre | Multimodal intervention including referrals to mental health, substance misuse services in addition to probation. | MST was provided for an average o 4.8 months. |
| **Conduct Disorder** | | | | | | |
| Ascher et al., 2013 | Good | Externalising Behaviour | Small | Post | Multimodal intervention however duration and frequency not reported. | MST provided for a 6-month period. |
| Ogden & Halliday-Boykins, 2004 | Good | Externalising Behaviour | Small | Pre | Regular Child Welfare services including home visits and supervision by a social worker for approximately six months. | MST was delivered for an average of 24.3 weeks, however the intensity during this period is unknown. |
| Sundell et al., 2008 | Strong | Externalising Behaviour | Insignificant | Pre | Multimodal intervention, no frequency or duration were reported | MST provided for an average of 20.8 weeks, though frequency and duration were not reported |
| Weiss et al., 2013 | Good | Externalising Behaviour | Insignificant | Post | Indirect school based behavioural management plan intervention | Frequency and duration of MST were not reported. |
| **Psychiatric Illness** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Henggeler et al.,1999 | Good | Youth Functioning | Insignificant | Pre | Admission to psychiatric unit for a mean of 15.6 days +8.5 hours community provision | MST provided for 97.1 hours over a period of 17.5 weeks |
| Rowland et al., 2005 | Good | Youth Functioning | Small | Pre | Multimodal and multiagency interventions, however frequency and duration of intervention were not reported | The frequency and duration of MST was not reported. |
| **Healthcare** | | | | | | |
| Ellis et al., 2004 | Good | Metabolic Control | Large | Pre | No psychotherapeutic intervention | Mean of 45 hours of MST delivered over a period of 6.5 months |
| Ellis et al., 2005 | Good | Medication Adherence | Insignificant | Pre | No psychotherapeutic intervention | MST delivered over 5.7months, frequency and hours unknown |
| Ellis et al., 2012 | Strong | Metabolic Control | Small | Post | 14 therapeutic phone calls delivered over a period of 4.9 months | MST provided for a mean of 45.7 hours over a period of 5.6 months |
| Letourneau et al., 2012 | Good | Medication Adherence | Insignificant | Post | 1 session of motivational interviewing | |
| Naar-King et al., 2009 | Good | BMI | Between groups analysis not possible | Pre | 10 group sessions followed by month review to match MST duration | MST delivered for a period of 6 months, frequency and duration are unknown. |
| Naar-King et al., 2014 | Strong | Medication Adherence | Medium | Post | Home based multimodal intervention delivered for a period of 4.2 months in which an average of 11 sessions were received | MST provided for 5.2 months amassing an average of 27.09 sessions |
| **Maltreatment** | | | | | | |
| Brunk et al., 1987 | Weak | Family Cohesion | Large | Pre | Parent training group delivered for 12 hours over a period of 8 weeks. | MST also provided for 12 hours over 8 weeks |
| Swenson et al., 2010 | Strong | Re-abuse | Insignificant | Pre | Enhanced community care, assertive outreach to parents to ensure their involvement in STEP-TEEN was provided for an average of 76 hours of treatment over 4 months. | MST was delivered on average for 88 hours over the course of 7.6 months. |

As can be seen in Table 8, across all 26 studies reviewed, only 13 studies (50%) referred to the frequency at which comparator interventions were provided and only 12 (46.2%) report the intervention duration, in comparison to 18 studies (69.23%) that document the intensity of MST. In the majority of studies MST appeared significantly more intensive than the MAU services. For this reason, it is hard to ascertain the influence that dose effects played in the outcomes. Of the 26 studies, only two studies (7.7%) reported that the comparator duration was matched to the duration of MST. In four studies (15.4%), the authors report that the comparator intervention was provided for a longer duration than MST. This issue with inequity of intervention intensity was present in most delivery contexts. Within five studies (19.2%) the comparator did not include a psychotherapeutic intervention consisting only either of no-treatment, medical review or court stipulations and case management (Ellis et al., 2005; Ellis et al., 2004, Henggeler et al., 1997; Henggeler et al., 1996; Henggeler et al., 1992). This is an important consideration as within these delivery contexts the comparator acts as a control, demonstrating efficacy but not effectiveness of MST. This is important as often across the body of literature effect sizes from both efficacy and effectiveness trials are pooled resulting in the overall effect size, and added value MST brings, being overestimated (Rosenblad, 2009; Lipsey & Wilson, 2001 & Lipsey, 1995). Within three studies (11.5%), active, standardised and unidimensional interventions were provided; within these studies outcomes indicated that MST was more effective at addressing primary outcomes. However, across the broad delivery contexts in which MST has been assessed there are several studies where MAU conditions appeared more robust. In 13 studies (50%) multimodal interventions were provided within the MAU condition; however, exactly what was provided remains unknown. It is in these conditions that MST is no longer found to be consistently more effective than MAU. These findings appear to suggest that trial design and appropriateness of comparator plays a large role in outcome. Where studies utilise current best practice guidance for working with adolescents,

effects of MST are diminished. Clinically and financially, this is an important finding as this suggests that the MST model does not necessarily yield better outcomes than existing practice; however, it can be considered as an alternative treatment model.

# Limitations

The present study builds on previous research; however, there are a number of limitations. Firstly, it may be considered that the pre-defined inclusion criteria gave rise to a level of selection bias (Drucker, Fleming & Chan, 2016). As the present study focused exclusively on randomized control trials (RCT) it may be considered that the inclusion criteria were set at a high standard. As a result, it is possible that this may have resulted in valuable studies with important information pertaining to usual service provision being excluded, such as quasi-experimental studies exploring the efficacy of MST. However, these strict inclusion criteria were imposed to limit the threat to internal validity which studies that do not adopt random allocation may be exposed to, and therefore aimed to reduce the inclusion of any additional unintentional bias (Campbell & Stanley, 1963).

Secondly, whilst efforts were made to ensure that the search process was inclusive and subject to limited sources of unintentional bias, it is important to consider factors within the search process which may have inflated the risk of bias. One such factor may be the limited resources available to the study which resulted in only studies published in English being included. Despite a global push for research to be published in English it is important to consider that there is a possibility that the current study includes a risk of language bias (Moher, 2007; Morrison et al., 2012). However, the present study incorporated search terms that were intentionally broad and comprehensive to maximise the results across several databases. Additionally, studies were cross referenced with current publications provided by Multisystemic Therapy Services who thoroughly document the body of published outcome trials. Consequently, it is unlikely that any peer reviewed articles

documenting MST's efficacy and effectiveness using RCT methodology would have been missed (Multisystemic therapy: research at a glance, 2019).

Additionally, all the included studies were conducted in the United States or within European countries. As such, the results cannot be generalised to countries operating within alternative socio-political frameworks. Within the current study we see that MST yields differing outcomes, in part due to different MAU conditions, across differing contexts and therefore it is important to interpret efficacy outcomes as relative to the organisational and socio-political context they are embedded within as opposed to absolute and global.

# Conclusion

The current study provided an overview of MAU conditions across all MST trials building on previous systematic reviews. It incorporated the most recent RCTs assessing the effectiveness as well as efficacy of MST. It focused on the role of MAU conditions, and considered how these may impact outcomes. It found that across and between these varied contexts of application comparators were vastly different, undefined and poorly reported. Findings within this study highlight the impact of the cultural, legal and socio-political differences in the conceptualisation of MAU conditions and outcome measures. It proposes that it is these differences that lead to the continued conflicting evidence for MST's value across, and within, its contexts of application. Many studies found that MST had a positive treatment effect on measures of ultimate outcome. However, this review found such findings were not consistent within isolated practice contexts, or across these. As the interventions delivered within comparator arms differed vastly, any treatment effects observed must be considered relative to the comparator, as opposed to as an absolute assessment of MST's value (Löfholm et al. 2013). Implications of such findings, both to clinical settings and within the field of research, are vast. They bring into question the role of evidence-based practice and suggest that where policy and clinical guidance is being drawn from the

evidence more scrutiny must be applied. Whilst RCTs currently offer the greatest degree of methodological rigour when applied to effectiveness trials utilising MAU as a comparator condition, there remains work to be done. Future studies assessing MST should report with further detail the comparison conditions, paying attention to the frequency, theoretic modality and duration of comparators allowing for non-specific therapeutic variables to be controlled for and inferences to be made specifically about MST.

In conclusion, whilst there is an expansive body of literature assessing MST's effectiveness, outcomes remain unclear. The current study highlights the complexity of comparing international outcome data to MST, but also within the wider field of psychological research, it emphasises the role of MAU conditions which are inextricably linked to legal, cultural and socio-political influences. The present review indicates that future research within the field of evidence-based practice and MST should focus greater attention on the conceptualisation and reporting of MAU conditions to support an understanding of the contexts in which evidence-based interventions such as MST work, and for whom.

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# Part Two: Empirical Paper

Characterising usual services offered to adolescent offenders in a randomised controlled trial: Assessing risk-need-responsivity in the management-as-usual arm of the Systemic Therapy for At Risk Teens trial

# Abstract

**Introduction:** Youth-perpetrated serious crime is on the rise, and as such is high on policy agenda. Whilst risk-focused research has identified risks for criminogenic outcome, little has been done to consider how risks and needs cluster together. The present study assessed the heterogeneity of a sample of young offenders by considering their risks and needs. It aimed to assess the existence of "profiles" of offenders and then assess if services are differentially provided based upon profile membership.

**Method:** Bifactor analyses were conducted across several clinically validated measures completed all by participants (n=684) as part of a multicentre randomised controlled trial. This process identified specific factors related to offending behaviour whilst controlling for general factors. Latent profile analysis (LPA) was then conducted to identify profiles of risk and need within the sample. Additional analyses assessed risk-need-responsivity by assessing if service provision was differentially provided based on baseline risk and need profile through negative binomial regression.

**Results:** Across a battery of assessment tools, bifactor analysis isolated 21 distinct risk factors. LPA revealed that these risks and needs cluster to provide three distinct risk profiles which are predictive of multi-agency service provision.

**Conclusions**: Findings indicated that antisocial young people are a complex heterogeneous cohort, with a variety of underlying needs. LPA suggests that these needs create three distinct profiles of risk and need which significantly predicts service provision from Youth Offending and Child and Adolescent Mental Health Services (CAMHS). Within this, those of higher risk were more likely to be detained and receive fewer community service contacts, suggesting there is room for development in intensive assertive outreach in UK services.

# Introduction

Adolescent antisocial behaviour is an important and growing public health concern in the United Kingdom due to the widespread impact it has on its perpetrators, victims, and wider society. The Ministry of Justice report that in 2017–2018 alone, crime perpetrated by those aged 10–17 equated to 70,300 of all proven offences, and whilst the Office of National Statics reports a steady decline in UK crime over the last decade, this is not the case for serious and youth perpetrated crime (Office of National Statistics, 2019). In fact, figures pertaining to youth-perpetrated violent crime present a conflicting picture where youth-perpetrated homicide, knife and gun crime is reported to be steadily rising across all police force areas in England and Wales (Youth Justice Board, 2019). As a result, the Serious Violence Strategy devised at policy level (UK Government, 2018) proposes comprehensive multi-agency response to support the complex needs of this cohort of young people. The development of targeted early intervention programmes which focus on reducing antisocial behaviour is emphasised within this. However, for such targeted interventions to be successful, the aetiology of antisocial behaviour and factors which contribute to its maintenance within UK populations must first be understood.

Within the UK, the term “antisocial behaviour” across domains of health, justice and social care holds differing definitions. As a result, what is considered by one service provider to be antisocial behaviour is considered acceptable by another (Car & Cowen, 2006; Nixon et al., 2003). Chiefly, the term represents an assortment of diverse behaviours which, at a societal level, are perceived to violate the rights of others (e.g. violence, damage or theft of property and deceitfulness) or age-appropriate norms (e.g. under-age consumption of alcohol, tobacco products and sexual behaviour) (Sellin, 1938). Within UK policy documentation it is described as “*conduct that has caused, or is likely to cause, harassment, alarm or distress to any person*” (Anti-social Behaviour, Crime and Policing Act, 2014, p. 2). Consequently,

the term antisocial behaviour incorporates a broad class of behaviour resulting in a complex phenotype, encompassing violence towards the person (e.g. common assault, grievous bodily harm, sexual assault, homicide) or in covert actions (e.g. theft or fraud). It is this metamorphic quality of antisocial behaviour that provides the greatest challenge to the services and agencies which aim to respond to and prevent its impact.

As antisocial behaviour is a heterogeneous phenotype, researchers in the field have long been presented with the challenge of identifying the underlying factors which contribute to the manifestation of such diverse behaviours. Over the last 40 years, this challenge has been addressed through the development of risk-focused research. Within this context, 'risk factors' refer to any characteristic (e.g. gender, genetic or physiological etc.) or experience (e.g. social economic experience, relational or abuse etc.) that a young person has either demonstrated or has been exposed to prior to displaying antisocial behaviour (Hawkins, Greene & Fuqua, 1995). This approach, often referred to as the risk factor prevention paradigm (RFPP) is an epidemiological approach based upon the analysis of statistical correlations between specific factors and criminogenic outcomes, such as the relationship between school exclusion and offending (Farrington, 2000). The benefit of such research is its utility in policy making and service development as it enables risk factors to be identified, and targeted interventions to be developed which aim to counteract them. As such, it has rapidly taken its place at the forefront of youth offending research and is embedded within policy and practice (O'Mahony, 2009).

However, whilst the RFPP provides a basis for understanding the complex and multifactorial influences that impact offending outcomes, there are limits to its utility in identifying causality (Haines & Case, 2008). Within the field of epidemiological research definitions of causality often differ across studies resulting in overestimated inferences to scientific causality being made (Kramer & Lane, 1992; Nijhus & Van der

Maesan, 2000; Susser & Susser, 1996). To address this, the Bradford-Hill (1965) criteria provides a framework for establishing causality within epidemiological research: where causality may be inferred through large effect sizes, specificity of sample and difficulty, temporality between effect and proposed cause, coherence between epidemiological and laboratory findings, observation of gradient or dose effects, experimental evidence, reversibility where effects are diminished when causes are removed and a consistent reproducibility of findings.

Regarding UK populations, significant contributions to RFPP come from the Cambridge Study of Delinquent Development, a longitudinal assessment of antisocial and offending behaviour within the UK, which identified multidimensional risk factors for offending behaviour (Farringdon & West, 1990). Across the body of risk focused research these results have demonstrated the principle of reproducibility both in the UK and beyond (Elliot, Huizinga & Ageton, 1985; Homel, 2005; Leober, 1998; Leober, Burke & Pardini, 2009; Rhee & Waldman, 2002 & Wilkstom & Leober, 1998). Generally, when collated across the evidence base, these risk factors can be categorised into five risk areas (McWhirter et al., 2007; Siegal et al., 2006; Withers & Russell, 2001) namely:

1. Individual risk factors including genetic (Eaves et al., 2000), personality traits (Dupéré, Lacourse, Willms, Vitaro & Tremblay, 2007) temperament (Caspi, Henry, McGee, & Moffitt, 1995) and mental health (Alleyne &Wood, 2010; Harris, Oakley & Picchioni, 2013; Ullrich, Keers & Coid, 2013)
2. Family risk factors including criminogenic family values, family processes and dynamics (Patterson, Reid, & Dishion, 1988)
3. Peers risks including peer rejection (Asher, Rose, & Gabriel, 2001) and deviant peers (Farrington, 1995; Melde, Taylor & Esbensen, 2009; Thornberry, 1987)
4. School risks (Werthamer-Larsson, Kellam, & Wheeler, 1991)

5. Community and societal risk including social exclusion (Peace, 2001), exposure to violence (Buka, Stichick, Birdthistle & Earls, 2001; Fowler, Tompsett, Braciszewski, Jacques-Tiura & Baltes, 2009) and other experiences of trauma (Dierkhising et al., 2013).

For this reason, antisocial behaviour and its development is considered within a multidimensional framework and may best be explained by utilising Bronfenbrenner's social ecological model (1979), where risk factors present across the system and contexts that make up the young person's social ecology.

Despite the identification of numerous diverse risk factors, these are often understood in multiplicative capacity (Herrenkohl et al., 2000) where risk and protective factors are viewed as sharing a linear relationship, and little focus is paid to the reciprocal and dynamic relationship between them. Schwalbe and colleagues (2008) suggest that there is a scarcity of research that examines integrated criminogenic needs examining the ways that antisocial adolescents differ, and consequently this population is often considered a homogeneous group (Onfiade et al., 2008).

The current study aims to fill this gap. It utilises data from the Systemic Therapy for At Risk Teens (START) trial (Fonagy et al., 2018) to consider specific risk factors and the profiles of risk underlying antisocial behaviour. It aims to build on previous research by assessing how MAU service provision is impacted by these risks. As such, the study aims to clarify several aspects of the experience of antisocial adolescents. To do so, the study first identifies latent factors within the battery of psychometric measures; it then assesses if these cluster together giving rise to profiles of risk and need. Many previous investigations assessing risks of antisocial young people have considered clinical symptoms and antisocial cognitive processes using data at a subscale level alone (Bor, McGee & Fagan, 2004; Ringland, 2011). Whilst this provides an insight into the complexity with which these young people

present to services, this only considers observable information. In contrast, the investigation of item-level data provides an enhanced assessment that builds on this, by enabling comprehensive evaluation of latent factors underpinning clinical and criminal observable behaviours (Curado, Teles & Marôco, 2014; St Clair et al., 2017). The advantage of utilising latent factors is not only that this reduces the dimensionality of data, but it also allows inferences to be made about unseen variables that are often hard to measure. For this reason, the current study employs factor analysis across a wide-ranging spectrum of item-level data from assessments pertaining to wellbeing, mental health symptomatology, parenting experiences and antisocial thinking.

Factor analysis is a method that typically identifies individual latent factors but often this ignores the underlying general factor that exists within the data. One approach that enables comprehensive assessment of all latent constructs is the bifactor model. Initially proposed by Holzinger and Swinford (1937), the bifactor acknowledges a general factor running through all instrument items whilst simultaneously identifying specific uncorrelated groups thought to represent latent factors. Therefore, the bifactor approach differs from other higher-order models (e.g. hierarchical models) as it suggests that latent factors are distinct and uncorrelated from the general factor (Gustafsson & Balke, 1993). Whilst a large portion of the research utilising bifactor modelling is embedded in intelligence research, where a general intelligence factor is identified alongside more specific factors such as speed of processing, verbal comprehension, reasoning and working memory (Beaujean, Parkin & Parker, 2014; Gignac, 2008; Murray & Johnson, 2013), in recent years, there has been increasing interest in its utility for the study of psychopathology and personality. In this context, the general factor is thought to represent general "*psychopathology"* which may account for comorbidity in mental health conditions as individuals demonstrate a general deficit in mental wellbeing as well as specific diagnostic disorders (Caspi et al., 2014; Lahey et al., 2012; Patrick, Hicks, Nichol &

Krueger, 2007; Simms, Gros, Watson & O'Hara, 2008). Building on this, the bifactor model is now under investigation as a prospective structure for explaining the complex needs of young people (Caspi & Moffit, 2018; Constantinou et al., 2019; Patalay, Fonagy & Deighton, 2015; St Clair et al., 2017). In the current study this is of value, as in contrast to psychopathology research where "*p*" is isolated to understand the complexity of co-morbidity, the present study will first extract and exclude the general factor. In doing so, it will isolate the specific risk factors found in antisocial samples, removing what will be known as the "*complexity*" factor.

The study will then consider how such latent risk factors cluster together using latent profile analysis (LPA): a technique that identifies latent profiles (i.e., groups) within a sample by evaluating patterns across variables (Gibson, 1959). As a probabilistic model, LPA suggests that cases demonstrating similar patterns belong together due to their similarities. For this reason, it provides a parsimonious way to evaluate the co-occurrence of theoretically meaningful and established latent risk factors as well as to classify complex antisocial young people. Finally, the study aims to evaluate how usual services respond to these risks and needs, most specifically to what degree MAU conditions presently offer a therapeutic approach that is focused on providing relevant psycho-social intervention that meets the criminogenic needs of adolescents at an appropriate intensity matching the risk posed (Evans-Chase & Zhou, 2014 & Vieira, Skilling & Peterson-Badali, 2009).

The START trial from which the data was taken was a pragmatic superiority trial assessing the effectiveness of multisystemic therapy (MST) within UK populations. Due to the accepted multidimensional aetiology of antisocial behaviour, MST has been heralded as an intervention to address the vast and diverse needs of this complex adolescent cohort (NICE, 2017). It is a systemic intervention designed in line with the risk factor prevention paradigm, where the intervention aims to counteract accepted risk factors that contribute towards the development of antisocial

behaviour. However, within the START trial, MST was found to be no more effective than MAU at reducing out of home placement or recidivism (Fonagy et al., 2018). Given the equivocal success of MAU and MST in the UK reported by Fonagy and colleagues, it is important to consider both what MAU was, but also how it was delivered, particularly given the disparity in service provision as highlighted in part one of this thesis.

In accord, the current study aims to consider usual service provision by assessing to what degree MAU is provided to antisocial adolescents in line with the risk-need-responsivity (RNR) framework. The RNR framework proposed by Bonta and Andrews (2003) posits that interventions should be provided in line with the principles of risk, need and responsivity (Andrews & Bonta, 2010a, 2010b; Andrews & Dowden, 2006; Blanchette & Brown, 2006; Ward, Melser, & Yates, 2007). The risk principle suggests that risk should govern intervention. It holds the view that it is those adolescents who are at the highest level of risk who will benefit from the most intensive levels of intervention, much like the 'stepped care' mode of service delivery (Andrews & Bonta, 2010; Hanson & Morton-Bourgon, 2009). The needs principle similarly suggests that interventions should be directly matched to the factors directly associated with antisocial behaviour and recidivism. For example, family interventions for poor monitoring or inconsistent discipline, psychological interventions for antisocial cognitions or pharmacological interventions for impulsivity because of ADHD. Finally, the responsivity principle dictates that interventions should be delivered in a medium which is accessible and matched to the individual's needs, such as learning ability or emotional tolerance, and to the strengths of the offender (Bonta & Andrews, 2016; Campbell et al., 2019; Markham, 2017). As the RNR principles were developed with adult populations in mind they have not yet been widely applied to antisocial adolescent populations (Singh et al., 2014).

## Current Study

The current study aims to address this and hypothesises that, in line with the RNR framework, risk and need profile at baseline will significant predict service provision. It will do so by using secondary data analysis techniques to answer the following questions:

1) What specific criminogenic latent risks and needs exist within the START sample?
2) Do specific risks factors cluster together to create profiles of risk and need at baseline?
3) Is profile of need at baseline predictive of differing MAU service provision across the sample?
4) Is treatment arm significantly predictive of MAU service provision?
5) Do treatment arm (MST or MAU) and risk and need profile impact offending?

# Methods

## Ethical Approval

The START study was approved by the London-South East Research Ethics Committee (reference number 09/H1102/55). The ethical opinion letter can be viewed in Appendix C.

## Trial Design

Full details outlining the START trial can be found in the study publication and protocol publication (Fonagy et al., 2018; 2013). START was a pragmatic, randomised nine centre superiority trial which compared MST followed by MAU to MAU alone on primary outcomes of time spent in out-of-home placements and offending behaviour in a cohort of antisocial adolescents. Service utilisation data were collated alongside

the collection of clinical assessment data at trial baseline, post-treatment (6 months) and at two distinct follow up periods (12 and 18 months).

## Participants

As documented within both the protocol paper and the RCT paper (Fonagy et al., 2018; 2013), all adolescents eligible for the trial were required to meet at least one of the following inclusion criteria: to have demonstrated frequent (≥ weekly) and enduring (≥ 6 months) aggressive or violent interpersonal behaviour; held a minimum of one conviction and three additional warnings, reprimands, or convictions; possessed a DSM-IV diagnosis of conduct disorder; had been subject to indefinite school exclusion due to antisocial behaviour; to present significant risk of harm to themselves or others.

The final sample consisted of 684 adolescents (mean age = 13.8, SD = 1.4, 11–18 at baseline). Most adolescents had an established diagnosis of conduct disorder (78%). Almost half (43.5%) of the sample participants were reported to have demonstrated early onset antisocial behaviour (conduct difficulties beginning prior to their 11$^{th}$ birthday) and approximately 65% of the sample had committed at least one offence prior to randomisation.

## Intervention and Randomisation

Adolescents were randomly allocated to either the treatment arm (multisystemic therapy + management-as-usual) or management-as-usual (MAU) alone through an equal allocation ratio that balanced for treatment centre, sex, current age, and age at onset of antisocial behaviour.

Multisystemic therapy (MST) is a multidimensional intervention that targets criminogenic risks across adolescents' multiple systems, including home, school, and peer environments. It is a family preservation model that aims to work with parents and carers to enhance skills in communication and improve family relationships. It

does so through teaching parenting techniques to encourage school attendance and achievement rather than antisocial behaviour and affiliation. MST embeds techniques from several therapeutic modalities including cognitive-behavioural therapy, parent training, and systemic family therapy to support the family to achieve their goals.

MAU services were provided by community services and replicated best-practice interventions for the management of antisocial youth who present with complex risks and needs. Whilst the MAU condition provided multimodal interventions that incorporated a broad array of intervention (e.g. offender specific treatment, family and individual psychotherapeutic intervention or social care provision) it lacked standardisation. It is the purpose of this study to conceptualise the MAU condition and consider the allocation of such services.

## Measures

All measures were taken at baseline, post-treatment, 12-month and 18-month follow up. Measures utilised within the study aimed to assess several factors identified within the literature as assessing factors that contributed to antisocial and offending behaviours.

### Psychological Functioning

As mental health, wellbeing and personality traits have been implicated in a great deal of research pertaining to adolescent offending, both mental health and mental wellbeing were assessed utilising the strengths and difficulties questionnaire (SDQ). Personality traits were assessed using the inventory of callous unemotional traits (ICU).

The SDQ provides a self-report evaluation of difficulties (Goodman, 1997). It is a validated measure utilised in almost all Child and Adolescent Mental Health Services within the UK. The SDQ comprises 25 items that assess an array of social and emotional difficulties such as “I am constantly fidgeting and squirming”, “I have a

good friend or more" and "I get a lot of headaches, stomach-aches or sickness." All items are scored on a three-point scale (not true = 0, somewhat true =1 and certainly true = 2). The SDQ was chosen due to the strong internal consistency (Cronbach's alpha = .81) and test-retest reliability (r = .71) it exhibits (Yao et al., 2009; Muris, Meesters & van den Berg, 2003; Goodman, 2001).

In addition to the SDQ, the inventory of callous-unemotional traits (ICU; Essau, Sasagawa & Frick, 2006) was also assessed. The ICU is a 24-item validated measure designed to assess the emotional capacity of adolescents identifying callous and unemotional (CU) traits through items scored on a 4 point Linkert scale (not at all true =0, somewhat true= 1, very true = 2 and definitely true =3). To assess this, the measure includes questions such as: "I hide my feelings from others", "The feelings of others are unimportant to me" and reverse scored items such as, "I always try my best". The ICU demonstrates a high level of internal consistency (Cronbach's alpha >.70) when applied to youth in contact with the justice system (Pechorro, Ray, Gonçalves & Jesus, 2017).

Further information pertaining to the onset of conduct disorder was also obtained. Previous research suggests that the onset of conduct disorder gives rise to two distinct groups of young people: those with adolescence-limited antisocial behaviour, and those with child onset and life-course-persistent antisocial behaviour (Moffitt, 1993).

## Parenting

Within the literature, parenting style and family cohesion has been identified as a factor which may either present as a protective or risk factor. The 15-item short form Alabama parenting questionnaire (APQ-15; Scott, Briskman and Dadds, 2010) was utilised as a measure of parenting style due to its short form, and high levels of external validity and inter-rater reliability quality (Scott et al., 2010). The APQ-15

proposes is scored on a five point Likert scale (never =1, almost never =2, sometimes =3, often =4 and always =5) through questions such as “Your parents compliment you when you do something well”, or “Your parents hit you with a belt or other object when you have done something wrong”.

## Antisocial Traits

In addition to mental health symptomatology, specific difficulties associated with offending behaviour were assessed. This encompassed a measure of antisocial traits but also specific antisocial cognitions.

Several studies have implicated perceptions of antisocial behaviour and antisocial cognition in the development of offending behaviours (Egan, Neary, Keenan & Bond, 2012; Walters, 2016; Weinberger & Schwartz, 1990). The antisocial beliefs and attitudes scale was utilised as a measure of antisocial cognition (ABAS; Butler, Leschied & Fearon, 2007). The measure contains 70 items, comprised of statements such as, “You have to let other teenagers know they can’t push you around”, or, “If my mother tried to get me into big trouble, I'd threaten to hurt her”, scored on a three-point Linkert scale (agree =0, not sure= 1 and disagree =3) and is demonstrated to show good internal consistency (Cronbach’s alpha = .77) and test-retest reliability (r = .77), that remains stable over an eight-week period (Butler et al., 2015).

A self-report delinquency measure (SRD; Smith & McVie, 2003) was also utilised as a measure of antisocial traits. The SRD provides an overview of the quality of antisocial behaviour included (e.g. bullying, fire setting, identity fraud, problem sexual behaviour, substance use, violence towards people or animals and weapon possession). A number of items on the measure are rated on a two-point scale (e.g. “During the last year did you take or try any illegal drugs?”, no or not sure = 0, yes = 1), others on a three-point subscale (e.g. “ How many of your friends drank alcohol

during the last year?", none or I'm not sure = 0, one or some = 1, most or all = 2) or four-point subscale (e.g. "How often do you drink alcohol now?" never or hardly ever = 0, once/ at least once a month = 1, 2 or three times /at least once a week = 2, and four times or more/everyday = 3), whilst the remaining items are rated on a six-point subscale (e.g. "During the last year, how many times did you use force, threats or a weapon to steal money or something else from someone?" once= 0, twice = 1, 3 times = 2, 4 times = 3, 5 times = 4, between 6 and 10 times = 5 and more than 10 times = 6). In addition to delinquency, the SRD provides information into experiences of abuse through questions such as, "During the last year how many times have you been bothered by an adult indecently exposing themselves to you?" providing an overview of the social and relational circumstances of the young person.

### Service Provision

The study aimed to consider how usual services are provided to antisocial young people using service utilisation records obtained from the nine trial sites. Data obtained included contact data from multiple agencies where MAU was provided. These agencies included a range of public sector and third sector organisations including Child and Adolescent Mental Health services (CAMHS), Youth Offending Teams (YOT) and Social Services (SS). All service provision data were provided as a frequency of contact, providing a measure of intensity as well as service provision diversity.

Interventions within these domains were provided by a range of disciplines. Within CAMHS, service provision ranged from individual interventions delivered by clinical psychologists, systemic family therapists, counsellors and psychiatry. Social care provision included interventions provided by a social worker, likely to include family assessment, child in need or child protection planning and placement procurement as well as interventions with the young person through family workers. Justice services provided interventions via probation workers as well as through the

youth offending team. Within this, the range of interventions included victim awareness courses, and courses focused on knife crime and aggression replacement.

## Analytical Plan

Analysis was conducted in three sections: evaluation of the structure of measures assessing risk and needs using latent-trait methods, person-centred analysis of individuals through latent profile analysis and finally an assessment of how management is impacted by these risks and needs.

### Factor Analysis

Analysis was conducted in two stages using both exploratory and confirmatory techniques. Within both assessments all indicators were considered categorical. First several confirmatory factor analyses (CFA) were conducted to examine the degree to which the factor structure identified by developers, or most recent clinically accepted model, of the ABAS, APQ-15, ICU, SDQ and SRD fit the data. CFA were conducted using the orthogonal rotation method, a methodology designed to assess uncorrelated factor solutions. The uncorrelated factor solution was selected to identify discrete and independent latent constructs. Following this, exploratory bifactor analyses were conducted and evaluated using the bi-goemin rotation method in Mplus 8.2 for Windows 10 (Muthén & Muthén, 2018). Bifactor CFA was then completed guided by the bifactor EFA results, considering common traits.

In line with previous research, the number of factors was determined through evaluation of the model fit statistics for each potential factor solution (Brown, 2006). Models were estimated using the weighted least squares means and variances adjusted estimator (WLSMV) due to its suitability for non-normal categorical variables (Yan et al., 2017). To assess model suitability the overall model fit was measured using the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square

error of approximation (RMSEA), and standardised root mean square residual (SRMR) (Reise, Kim, Mansolf & Widaman, 2016). Definitions of fit were established where acceptable, good and excellent fit, respectively, were achieved when CFI values were ≥ .85, ≥ .90 and ≥ .95, TLI values were ≥ .85, ≥ .90 and ≥ .95, RMSEA values were ≤. 09, ≤ .08 and ≤ .06, and SRMR values were ≤. 09, ≤ .08 and ≤ .06. (Hooper et. al, 2008 & Hu and Bentler, 1999). In addition, further model fit analyses were undertaken using the maximum likelihood ratio. Recognising that bifactor modelling has been subject to criticism, and that authors suggest they may overfit noise (Constantinou et al., 2019) additional analyses were completed re-estimating the models using the maximum-likelihood estimator, enabling further comparison of models, ensuring the most parsimonious models were selected.

## Latent Profile Analysis

Secondly, in the main analyses, latent profile analysis (LPA) was conducted. The latent risk factors identified during the factor analyses of all measures were saved and re-entered into the LPA analysis as continuous indicators. To do this, individual factor scores were calculated for each participant across for each latent variable. This approach enabled the specific risk factor variables to be utilised whilst controlling for the general factors in all measures.

As there was no prior hypothesis with regard to the number risk profiles within the sample, the analysis began with a two-profile model and was increased in the number until the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR-LRT; Lo, Mendell & Rubin, 2001) became non-significant using the maximum likelihood robust (MLR) estimator. Further assessment of model fit was conducted using the bootstrap likelihood ratio difference test (B-LRT) (Geiser, 2013; Saunders, Cape, Fearon & Pilling, 2016). The VLMR-LRT and B-LRT both consider the fit of the K model (the current proposed model) with the K-1 model (a model with one fewer distinct profile) (Stanley, Kellermanns & Zellweger, 2016). Within these comparison assessments

significant p-values indicate that the current model provides the best explanation of the data. Model fit was further assessed through consultation of the Akaike information criterion (AIC) and Bayesian information criterion (BIC) as well as entropy values (Nylund, Asparouhov & Muthén, 2007). Where AIC and BIC were compared across models, lower values are considered to suggest better model fit. In contrast, higher entropy values are considered to indicate greater classification accuracy (Chen, Jin, Shang & Zhang, 2019).

## Assessment of Risk-Need-Responsivity

Additionally, a series of regression analyses were undertaken in SPSS 24 (IBM Corp, 2016) where profile membership and treatment arm were considered independent variables. These focused on establishing if baseline risk and need profile predicted service provision allocation. As the service utilisation data were widely dispersed count data, as is a common problem within service provision data, negative binomial regression (NBR) was conducted (Wagner, Riggs & Mikulich-Gilberson, 2015). NBR is a specific regression model which incorporates a dispersion parameter to accurately assess over-dispersed non-parametric count outcomes where the variable variance exceeds the mean (Hilbe, 2014).

## Assessing Impact of Treatment Arm and Profile on Offending Outcomes

Following the identification of risk profiles, further analysis was conducted on the impact of treatment and profile (established with the LPA) on objective offending data obtained from the police computer national database. Poisson models were selected to account for the structure of the objective offending data, which was considered a count variable (Garnder, Mulvey & Shaw, 1995). In order to explore the impact of both treatment and profile on the count of offending over five time periods (Baseline, 6-, 12-, 18- and 24-month follow-up) mixed effects Poisson regression models were constructed. Through this analysis, both fixed effects and random effects were

assessed, where fixed effects control for the effects of time-invariant variables and random effects estimate the effect of time invariant variables (Williams, 2018). Within the analysis treatment arm, profile and time were considered fixed effects and participant id and time were considered random effects.

# Results

## Factor Analysis and Model Comparison

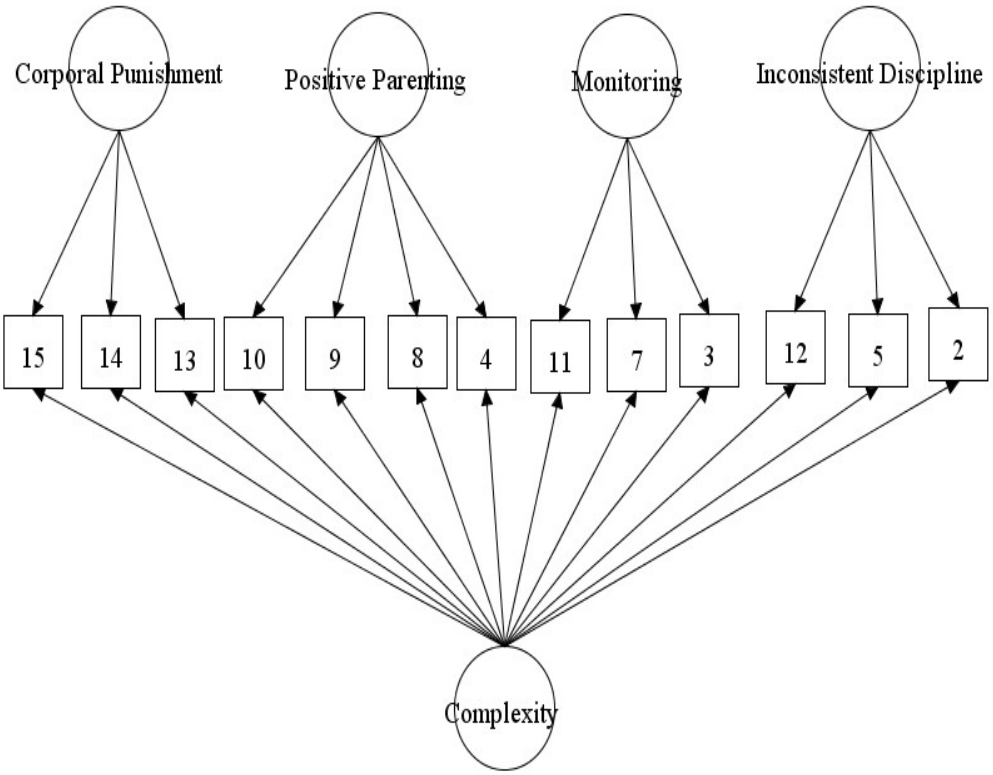
Model comparisons were conducted for all measures and can be found in Table 9. As can be seen, several first order models were performed across the various assessment measures. These began considering the most widely accepted and clinically utilised structures. Across all the measures single level, first-order (e.g. non-hierarchical or bifactor), models provided poor fit as evidenced by their model fit statistics and bifactor models provided better explanation of the risks across the measures.

### Alabama Parenting Questionnaire

Focusing on the Alabama parenting questionnaire (APQ-15), the model fit statistics demonstrate that the clinically accepted five-factor structure provides a poor fit ($\chi^2$ (88) = 1932.950, $p < .05$, CFI = .78, TFI = .33, ΔRMSEA = .18, ΔSRMR = .14, ΔAIC =25323, ΔBIC = 25690). Nested confirmatory models were then conducted, however, these too provided poor fit, as can be seen in Table 9. Bifactor solutions provided the best fit and further nested models were compared. A four-factor bifactor solution provided excellent fit ($\chi^2(74) = 251.80$, $p < .05$, CFI = .98, TFI = .97, ΔRMSEA = .06, ΔSRMR = .05, ΔAIC =24940, ΔBIC = 25365). This model structure, as seen in Figure 2, provided a general factor and four uncorrelated specific factors: positive parenting, inconsistent discipline, monitoring and corporal punishment. This enabled specific risk and protective factors to be isolated, and items of clinical relevance to be

identified, for example, where the factor of positive parenting is considered specific items that positively loaded onto this included: “Your parents praise you for behaving well” (λ =.36) and “You play games with or do other fun things with your mum” (λ =.31) reflecting parental warmth and involvement. Similarly, specific items loaded onto corporal punishment (e.g. “Your parents spank you with their hand when you have done something wrong”, λ =.91), inconsistent discipline (e.g. “Your parents let you out of a punishment early (like lift restrictions earlier than they originally said)”, λ =. 73) and monitoring (“You stay out in the evening past the time you are supposed to be home”, λ =. 74) providing distinct indicators of risk. Please see summary Table in Appendix F for itemised factor loadings.

**Figure 2**. **Bifactor Model of the Alabama Parenting Questionnaire (15-item)**



## Antisocial Beliefs and Attitudes Scale

Where the antisocial beliefs and attitudes scale (ABAS) was used a similar pattern was observed: like the APQ, the clinically accepted subscale model provided a poor fit. As can be seen in Table 9, nested bifactor models were performed, and a revised four-factor bifactor model provided the best solution ($\chi^2$ (625) =2041.590, p < .05, CFI = .94, TFI = .93, ΔRMSEA = .06, ΔSRMR = .05, ΔAIC =47057, ΔBIC = 47318). Within this model, specific factors identified were antisocial attitude (e.g. “The police should [not] be paid more for their work”, λ =.50), rule compliance (e.g. “I do not like to obey all the rules at school and home”, λ =.31), aggression (e.g. “If my mother tried to get me into big trouble, I'd threaten to hurt her”, λ =.55) and antisocial identity (e.g. “Young people who break the law think like me”, λ =.62). Please see Table in Appendix G for full factor loadings.

## The Inventory of Callous Unemotional Traits

The inventory of callous unemotional traits (ICU) also demonstrated poor model fit where first-order models were considered. In line with the other measures, bifactor models provided the best solution. Nested model comparisons suggested that a three-factor bifactor model explained the data in the most parsimonious way and yielded an almost excellent fit ($\chi^2$ (103) = 351.321, p < .05, CFI = .94, TFI = .92, ΔRMSEA = .06, ΔSRMR = .05, ΔAIC =27364, ΔBIC = 27479). This model identified a general factor and three specific factors: callous (e.g. “I do not care who I hurt to get what I want”, λ =.42), unemotional (e.g. “I am [not] very expressive and emotional” λ =.73) and uncaring (e.g. “I [do not] work hard on everything I do”, λ =.61). See Table in Appendix I for full factor loading.

**Table. 9 Summary Table of Model Fit Statistics and Model Comparisons**

| Measure | Model Number | Model Descriptor | $\chi^2$ | df | RMSEA | SRMR | CFI | TLI | AIC | BIC |
|---|---|---|---|---|---|---|---|---|---|---|
| **APQ** | Model 1 | 5 factor subscale model (Scott, Briskman and Dadds, 2010) | 1932.950 | 88.000 | 0.175 | 0.135 | 0.777 | 0.734 | 25323.000 | 25690.000 |
| | Model 2 | 3 factor model | 6181.577 | 96.000 | 0.350 | 0.178 | 0.265 | 0.196 | 14860.742 | 14922.770 |
| | Model 3 | 4 factor model | 5200.000 | 90.000 | 0.282 | 0.149 | 0.383 | 0.280 | 25970.190 | 26327.551 |
| | Model 4 | 3 factor bifactor model | 740.340 | 82.000 | 0.109 | 0.070 | 0.920 | 0.898 | 25211.150 | 25604.700 |
| | ***Model 5*** | ***4 factor bifactor model*** | ***251.080*** | ***74.000*** | ***0.057*** | ***0.047*** | ***0.979*** | ***0.972*** | ***24940.000*** | ***25365.000*** |
| | Model 6 | 5 factor bifactor model | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| **ABAS** | Model 1 | 3 factor subscale model (Butler et al., 2015) | 48951.778 | 2322.000 | 0.171 | 0.308 | 0.030 | 0.030 | 104774.879 | 105087.366 |
| | Model 2 | 4 factor model | 9526.177 | 1310.000 | 0.096 | 0.166 | 0.401 | 0.370 | 66130.534 | 66364.907 |
| | Model 3 | 5 factor model | 32267.000 | 1521.000 | 0.171 | 0.253 | 0.192 | 0.141 | 75676.470 | 76010.695 |
| | Model 4 | 3 factor bifactor model | 5953.010 | 2275.000 | 0.048 | 0.062 | 0.925 | 0.920 | 88268.430 | 88743.960 |
| | ***Model 5*** | ***4 factor bifactor model*** | ***2041.590*** | ***625.000*** | ***0.057*** | ***0.054*** | ***0.937*** | ***0.930*** | ***47056.876*** | ***47317.735*** |
| | Model 6 | 5 factor bifactor model | 3494.715 | 1464.000 | 0.045 | 0.052 | 0.946 | 0.941 | 73648.661 | 74071.197 |
| | Model 7 | 6 factor bifactor model | 2198.620 | 691.000 | 0.056 | 0.054 | 0.939 | 0.931 | 50859.216 | 51143.172 |
| **ICU** | Model 1 | 3 factor subscale model (Essau, Sasagwa & Frick, 2006) | 25454.380 | 252.000 | 0.116 | 0.112 | 0.599 | 0.561 | 39591.000 | 40043.000 |
| | Model 2 | 4 factor subscale model (Frick & Hare, 2001) | 3405.020 | 249.000 | 0.136 | 0.132 | 0.448 | 0.388 | 40347.730 | 40482.570 |
| | Model 3 | 5 factor model | 619.460 | 219.000 | 0.052 | 0.048 | 0.930 | 0.912 | 38935.550 | 39537.180 |
| | Model 4 | 2 factor bifactor model | 694.678 | 122.000 | 0.083 | 0.061 | 0.862 | 0.862 | 29373.782 | 29492.445 |
| | ***Model 5*** | ***3 factor bifactor model*** | ***351.321*** | ***103.000*** | ***0.060*** | ***0.045*** | ***0.940*** | ***0.920*** | ***27364.113*** | ***27478.730*** |
| | Model 6 | 4 factor bifactor model | 485.172 | 77.000 | 0.088 | 0.063 | 0.837 | 0.778 | 29268.958 | 29383.576 |

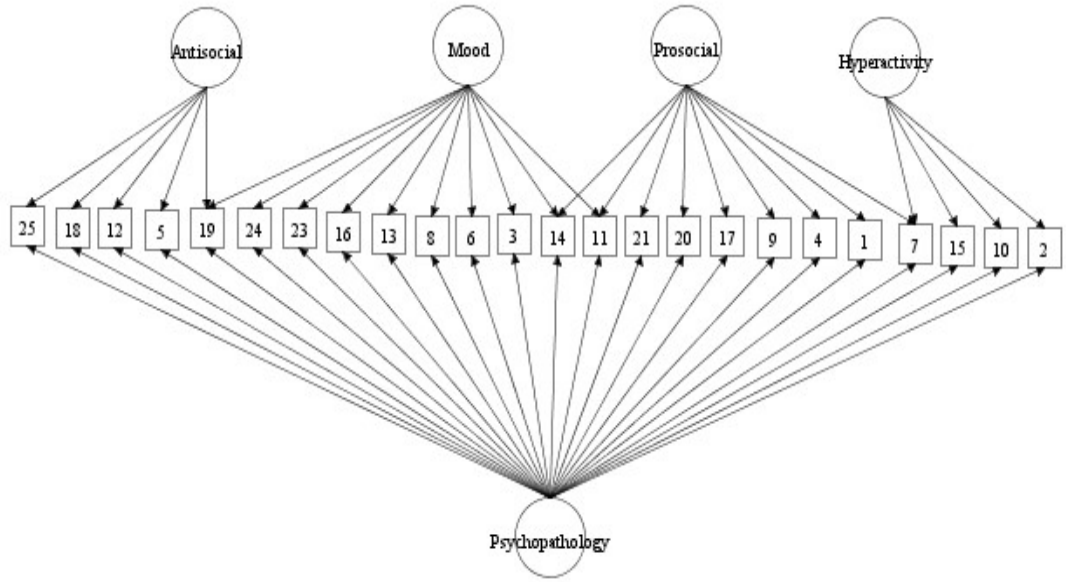
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **SDQ** | Model 1 | 5 factor subscale model (Goodman, 2001) | 1098.500 | 265.000 | 0.068 | 0.091 | 0.788 | 0.760 | 29974.008 | 30340.298 |
| | Model 2 | 2 factor model | 837.404 | 183.000 | 0.073 | 0.088 | 0.824 | 0.798 | 25667.090 | 25760.037 |
| | Model 3 | 3 factor model | 853.000 | 265.000 | 0.057 | 0.081 | 0.850 | 0.831 | 29828.000 | 29942.490 |
| | Model 4 | 4 factor model | 1029.245 | 258.000 | 0.066 | 0.088 | 0.804 | 0.772 | 29812.304 | 29936.225 |
| | Model 5 | 2 factor bifactor model | 551.223 | 150.000 | 0.063 | 0.108 | 0.873 | 0.839 | 30499.835 | 30603.552 |
| | Model 6 | 3 factor bifactor | 718.850 | 245.000 | 0.053 | 0.063 | 0.880 | 0.852 | 29783.952 | 29922.691 |
| | ***Model 7*** | ***4 factor bifactor*** | ***526.581*** | ***233.000*** | ***0.042*** | ***0.057*** | ***0.927*** | ***0.907*** | ***29548.467*** | ***29706.063*** |
| | Model 8 | 5 factor bifactor model | 917.530 | 187.000 | 0.760 | 0.091 | 0.781 | 0.729 | 26313.064 | 26431.598 |
| **SRD** | Model 1 | 5 factor model | 17203.204 | 2926.000 | 0.085 | 0.229 | 0.509 | 0.496 | 91725.983 | 92357.070 |
| | Model 2 | 6 factor model | 15574.603 | 2348.000 | 0.091 | 0.225 | 0.539 | 0.526 | 84188.002 | 84762.332 |
| | Model 3 | 7 factor model | 16545.322 | 2852.000 | 0.084 | 0.226 | 0.525 | 0.512 | 89132.433 | 89754.061 |
| | Model 4 | 5 factor bifactor | 7119.108 | 2278.000 | 0.056 | 0.085 | 0.831 | 0.821 | 85730.806 | 86420.002 |
| | ***Model 5*** | ***6 factor bifactor*** | ***6433.043*** | ***2278.000*** | ***0.055*** | ***0.079*** | ***0.889*** | ***0.876*** | ***85081.144*** | ***85728.447*** |
| | Model 6 | 7 factor bifactor | 6812.180 | 2278.000 | 0.054 | 0.081 | 0.842 | 0.832 | 89045.800 | 89794.456 |

*Note: χ 2=Chi squared; df= degrees of freedom; RMSEA = Root Mean Square Error of Approximation; SRMR= Standardised Root Mean Square Residual; CFI = Comparative Fit Index; TLI=Tucker-Lewis Index; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.*
**APQ five factor bifactor not possible due to model nonconvergence*

## The Strengths and Difficulties Questionnaire

Similarly, as seen in Table 9, first-order models of the strengths and difficulties questionnaire (SDQ) provided a poor model fit ($\chi^2$ (265) = 1098.5, p < .05, CFI = .79 TFI = .76, ΔRMSEA = .07, ΔSRMR = .09, ΔAIC =29974, ΔBIC = 30340). Where bifactor solutions were considered, a four-factor bifactor solution yielded the best model fit ($\chi^2$ (233) = 56.581, p < .05, CFI = .93, TFI = .91, ΔRMSEA = .04, ΔSRMR = .06, ΔAIC =29549, ΔBIC = 29706). This model, seen in Figure 3, identifies a general factor and specific factors of hyperactivity (e.g. "I am restless, I cannot sit still", λ = .53), mood (e.g. "I worry a lot", λ = .72), antisocial traits (e.g. "I am often accused of lying or cheating", λ = .38) and prosocial attitude (e.g. "I am helpful if someone is hurt, upset or feeling ill", λ = .73). It is of note that where the SDQ was considered, several items in this model cross loaded, for example item 14, "Other people do not generally like me" negatively loaded onto the "prosocial" factor but positively loaded onto the "mood" factor suggestive that opposite responses to this question are indicative of differing underlying factors.

**Figure 3**. **Bifactor Model of the Strengths and Difficulties Questionnaire**



### The Self-Reported Delinquency Scale

When applied to the self-reported delinquency scale (SRD) several models were assessed. First-order models provide a poor fit, and therefore bifactor models were tested, but a six-factor bifactor solution provided the best fit ($\chi^2$ (2278) = 6433.043, $p < .05$, CFI = .89, TFI = .88, ΔRMSEA = .06, ΔSRMR = .08, ΔAIC =85081, ΔBIC = 85729. The factors identified within this model were difficulties in school (e.g. “How often in the last year were you cheeky to a teacher”, λ = .78), peer delinquency (e.g. “During the last year how many times did you skip or skive school”, λ = .77), substance misuse (e.g. “How often have you tried Magic Mushrooms”, λ = .67), callousness (e.g. “How often have you threatened to hurt them in the last year”, λ = .77), criminal and offending behaviour (e.g. “How many times did you break into a house or building to steal something”, λ = .45) and previous experiences of being bullied (e.g. “Bullied by somebody hitting, kicking, punching or throwing stones at you”, λ = .77).

## Latent Profile Analysis

Factor analyses identified many interesting factors, influencing a broad range of pertinent risks to criminogenic and antisocial behaviour. The total number of factors amassed 21 variables; as such it was likely that this exceeded the number of variables that an LPA would be able to handle. Statistical power in LPA is an understudied area of research and as such there is no gold standard. Recent research suggests that the greater the number of indicators, or input variables, the lower the statistical power and increased risk of measurement error (Tein et al., 2013 & Uebersax, 2000). It is proposed that greater numbers of indicators increase data sparseness that in turn may negatively impact analysis by increasing boundary parameter estimates (Galindo-Garre & Vermunt, 2006). For this reason, only one factor score representing each latent factor was included in the analysis and duplicate factors were excluded

(including the “callousness” factor from the SRD, the “prosocial attitude” factor from the SRD and SDQ as well as the “antisocial” factor from the SDQ).

To further reduce measurement error, only highly influential variables identified within the literature were included within the analysis. These included risk factors across the adolescents’ ecological systems, including individual factors such as cognitive indicators of antisocial attitude, antisocial identity and rule (non)compliance (Hardy, Bean & Olsen, 2015) as well as factors pertaining to temperament and mental health including the onset of conduct disorder (Moffit, 2018 & 1993), self-reported hyperactivity (Bergman, Andershed & Andershed, 2009 & Lynam, 1996), mood difficulties (Pulkkinen et al., 2009) as well as callousness and unemotional traits (Caspi, Rutter & Silva, 2001; Dupéré, Lacourse, Willms, Vitaro & Tremblay, 2007). As parenting factors are implicated across the body of research pertaining to adolescent antisocial behaviours, inconsistent discipline (Frick et al., 1992) and poor monitoring (Loeber & Sotuhamer-Leober, 1998; Lynam et al., 2000; Rothbaum & Weisz, 1994) factors were included in the analysis. Outside family relationships, peer relations are a focus of much of the risk-focused literature, including both peer rejection as well as peer delinquency. For this reason, factors of bullying (Dubow, Huesmann, Boxer & Smith, 2014) and peer delinquency (Farrington, Ttofi & Piquero, 2016) were included. Across all forensic literature, history of antisocial behaviour is considered a large risk of future offending, particularly when focused on adolescent populations’ self-reported aggression and self-reported criminal and offending behaviour are identified (Herrenkohl et al., 2000; Jolliffe et al., 2017; Leober & Farrington, 2000). As such, factors of aggression and offending and criminal behaviour were included.

The factor representing antisocial attitude derived from the SDQ was excluded given the overlap this had with antisocial attitude factor from the ABAS. Similarly, the callous factor derived from the SRD was also excluded due to overlap with the callous

factor from the ICU. Factors representing positive constructs such as positive parenting (APQ) and prosocial attitude were also excluded as these factors do not represent risks or needs. Additionally, whilst factors of substance misuse, school difficulties and corporal punishment have been identified within the literature as contributing to antisocial behaviour, these factors represented those for which there was the most missing data, and therefore factors with more participant factor scores were favoured (72%, 83% & 88% respectively). The final variables included reduced from 22 to 14 and can be viewed in Table 10.

**Table 10. Summary Table of Variables Included in LPA**

| Domain | Measure | Indicator |
|---|---|---|
| **Cognitive** | ABAS | Antisocial identity |
| | ABAS | Antisocial attitude |
| | ABAS | Rule compliance |
| **Mental Health/ Personality Traits** | ABAS | Aggression |
| | ICU | Callousness |
| | SDQ | Hyperactivity |
| | SDQ | Mood difficulties |
| | ICU | Unemotional |
| | Diagnostic Information | Onset of conduct disorder |
| **Parenting** | APQ | Inconsistent discipline |
| | APQ | Monitoring |
| **Peer** | SRD | Bullied/victimised |
| | SRD | Peer delinquency |
| **History** | SRD | History of criminal and offending behaviour |

*Note: ABAS; Antisocial beliefs and attitudes scale; APQ: Alabama parenting questionnaire; ICU: Inventory of callous and unemotional traits; SDQ: Strengths and difficulties questionnaire; SRD: Self-reported delinquency scale*

As can be seen in Table 11 below, LPA for the sample yielded significant p-values on the VLMR-LRT comparing successive models from a two-profile model to a four-profile model (p=.715 at the four-profile solution). A three-profile solution provided the best solution for the data, where a significant result was achieved on the VLMR (p=.044) as well as decreasing AIC and BIC. A higher entropy value was also obtained on the three-profile solution, indicating a greater level of profile accuracy (.842) than a two-profile solution (.794).

**Table. 11 Summary Table Showing Model Fit Statistics and Model Comparisons for LPA**

| Model Number | Model Descriptor | VLMR | BLRT | Entropy | AIC | BIC | Profile 1 (%) | Profile 2 (%) | Profile 3 (%) | Profile 4 (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| LPA1 | 2 Profile Solution | 0.000 | 0.000 | 0.794 | 21090.644 | 21147.402 | 74.82 | 25.18 | ~ | ~ |
| ***LPA2*** | ***3 Profile Solution*** | ***0.044*** | ***0.000*** | ***0.842*** | ***21046.842*** | ***21123.870*** | ***30.16*** | ***63.40*** | ***6.44*** | ***~*** |
| LPA3 | 4 Profile Solution | 0.715 | 0.000 | 0.865 | 21032.603 | 21129.901 | 1.90 | 62.52 | 28.11 | 6.88 |

*Note: VLMR= Vuong-Lo-Mendell-Rubin likelihood ratio test; LMR = Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT= Bootstrapped likelihood ratio test; AIC = Akaike information criterion; BIC = Bayesian information criterion.*

Descriptive statistics and the distribution of participant characteristics for each profile are provided in Table 12, allowing for the comparison of patient characteristics between profiles. For example, profile three represents a group which comprised more male patients (61.4%) with a higher proportion of individuals based in the Greater London area (34%). This is of interest, as prominent psychiatrist within the field of youth "at risk", Menninger, proposed in his seminal writings that "*nowhere is the critical mass of youth at risk greater than in the inner cities of large metropolitan areas"* (Brendtro, Brokenleg & van Brockern, 1990, p. 17). In contrast, profile one comprised a balance of both male and female participants (52.40% and 47.60%, respectively). Within this patient profile the geographic representation was more widely dispersed. Across all patient profiles, white British/European individuals represented the greatest proportion of all profiles.

**Table 12. Summary Table Showing Descriptive Statistics and Profile Demographics**

| | | Profile 1 (n= 206) | Profile 2 (n=433) | Profile 3 (n=44) |
|---|---|---|---|---|
| **Ethnicity (%)** | White British/ European | 84.50 | 74.60 | 86.40 |
| | Black African/ Afro-Caribbean | 6.30 | 12.50 | 9.10 |
| | Asian | 1.00 | 3.00 | 2.30 |
| | Mixed/Other | 7.30 | 8.30 | 0 |
| | Missing | 1.00 | 1.40 | 2.30 |
| **Sex (%)** | Male | 52.40 | 68.80 | 61.40 |
| | Female | 47.60 | 31.20 | 38.60 |
| **Site (%)** | Barnsley | 10.20 | 10.40 | 9.10 |
| | Greenwich | 14.60 | 10.40 | 9.10 |
| | Hackney | 6.80 | 11.10 | 18.20 |
| | Leeds | 7.80 | 13.90 | 9.10 |
| | Merton & Kingston-upon-Thames | 13.60 | 10.60 | 15.90 |
| | Peterborough | 7.80 | 14.10 | 13.60 |
| | Reading | 15.00 | 11.10 | 2.30 |
| | Sheffield | 10.70 | 9.90 | 11.40 |
| | Trafford | 13.60 | 8.50 | 11.40 |
| **Age** | M (SD) | 14.02 (2.00) | 14.46 (1.75) | 13.81 (1.32) |

Table 13 provides an overview of mean indicator scores across the three profiles. Within this, profile one (P1) may be considered to represent a group of individuals of lower antisocial risk, but with moderate mental health concerns such as elevated hyperactivity and mood difficulties. It highlights that, where mean factor scores are considered, this group present with reduced antisocial cognitions and history of offending behaviour. However, on average, this group demonstrate an antisocial attitude. Additionally, this group present with greater difficulties with peers: mean factor scores indicate that this is a group of individuals who have experienced bullying at a greater frequency and engage in less frequent peer delinquency.

**Table 13. Summary Table Showing Mean Factor Scores of Latent Variables Across Profiles**

| Indicator | | Profile 1 (n=206) | Profile 2 (n=433) | Profile 3 (n=44) |
|---|---|---|---|---|
| **Cognitive** | Antisocial Identity | -.030 | .002 | .171 |
| | Antisocial Attitude | .025 | -.017 | .096 |
| | Rule Compliance | -.020 | -.080 | -.060 |
| **Mental Health/ Personality Traits** | Aggression | .083 | .084 | .504 |
| | Callousness | -.040 | .054 | -.140 |
| | Hyperactivity | .027 | -.020 | -.210 |
| | Mood Difficulties | .068 | .027 | .111 |
| | Unemotional | -.007 | -.014 | -.114 |
| **Parenting** | Inconsistent Discipline | -.030 | .036 | -.250 |
| | Monitoring | .010 | .003 | .086 |
| **Peer** | Bullied/Victimised | .729 | -.380 | 1.802 |
| | Peer Delinquency | -.200 | .033 | -.170 |
| **History** | History of criminal and offending behaviour | -.200 | .085 | .162 |

In contrast, profile three (P3), a group making up only 6 % of the sample, represents a group of individuals with greater antisocial risk: where individuals present with greater mean scores on factors of antisocial cognitions such as an ascribing to an antisocial identity and a more generalised antisocial attitude. In

addition, this group score higher on factors representing aggression, and present with higher levels of self-reported historic and criminal behaviour. Within this profile, parental factors indicate that parental discipline is provided more consistently with increased monitoring. However, like profile one, this group also demonstrate poor peer relationships with low levels of peer delinquency and the highest frequencies of bullying and victimisation, indicating social isolation and exclusion.

Profile two (P2) represents a profile of moderate risk where individuals on average present with greater scores pertaining to callousness and rule compliance. Unlike P1 and P3, individuals in P2 on average report fewer experiences of bullying and greater levels of peer delinquency.

## Service provision and utilisation

The next step of the analysis was to assess whether LPA risk profiles predicted service allocation, provision and utilisation.

The intensity of service provision across all agencies was provided as a count of session/days, and as such Poisson modelling was performed. Tests for dispersion were conducted, and as the range exceeded the mean negative binomial regressions were performed. Please see Appendix O for histograms demonstrating data dispersion. Results assessing total intensity of multiagency service provision were non-significant, suggesting that baseline risk profile was not predictive of service provision. However, between profiles significant interactions were observed. As can be seen in the summary Table in Appendix P, comparisons to P1 indicate that profile P3 is statistically predictive of total service provision. Individuals in P3 demonstrate a reduced incident rate ratio, suggesting that those in P3 were in receipt of the reduced rate of .62 times the number of service contacts of those in P1.

## CAMHS Provision and Utilisation

When attention was paid specifically to CAMHS provision, the test of model effects ($\chi^2$ (2, 495) = 10.48, p < .01) and Omnibus test ($\chi^2$ (2, 495) = 10.18 p < .01) suggest that profile was a significant predictor of CAMHS provision and utilisation. Where profiles were compared, as shown in the summary table in Appendix P, significant effects were found. Similar to the assessment of total service provision, P2 and P3 significantly predicted CAMHS provision. Compared with P1, these profiles predicted significantly reduced incident rate ratios for service provision or utilisation (P2: $\chi^2$ (2, 462) = 4.28, p < .01, IRR= .799 & P3: $\chi^2$ (1, 191) = 10.48, p < .01, IRR= .510). When assessed by discipline, this pattern remained the same across almost all disciplines. Across all disciplines, except those provided by family therapists, analysis identified that P2 and P3 were significantly predictive of lower incident rate ratios of service provision or utilisation. However, where family therapy was considered, P2 significantly predicted increased incident rate ratios of family approaches, with records suggesting those in P2 were in receipt of 1.8 times more contacts than for P1.

## Social Services Provision and Utilisation

Social services provision did not demonstrate this pattern and profile was not found to be predictive ($\chi^2$ (2, 490) = 4.00, p = .135). When broken down, as highlighted in Appendix P, no one profile was found to be significantly predictive of service provision, suggesting that services by social workers and family support workers were not differentially provided based on risk profiles.

## Justice Service Provision and Utilisation

Related to justice service provision, including youth offending teams (YOT), and probation and custody services, profile was a significant predictor ($\chi^2$ (2, 492) =

21.79, p <.01). When compared to P1, P2 demonstrated significant predictive value, suggesting that those in P2 were in receipt of 1.49 times more service contacts. This remained the same when broken down into distinct service provision and P2 was significantly predictive of provision both from the YOT and probation services. When compared to incident rates for P1 it can be observed that those in P2 received 1.56 and 1.61 times the number of contacts with YOT and probation services respectively. In contrast, membership to P3 was significantly predicted of fewer contacts with the YOT where the incident rate ratio suggests individuals in P3 received .44 times the number of contacts than those with membership to P1.

### Substance Misuse Provision and Utilisation

Profile was also found to be a significant predictor of substance misuse service provision and utilisation, ($\chi^2$ (2, 498) = 18.92, p < .01). When compared to P1, P3 significantly predicted a higher level of service provision where P3 received 2.64 times more contacts than P1. P2 was also predictive of increased service provision and utilisation and received 1.18 times more contacts than P1.

### Out-of-Home Provision

Over the course of the trial, MAU included a range of out-of-home service provisions. These were provided by several agencies, and included custody, admission to hospital or residential placement. When duration of out-of-home placement provision was considered, profile remained a significant predictor ($\chi^2$ (2, 498) = 34.24, p < .01). Both P2 and P3 were significantly predictive of extended out-of-home placement. Those in P3 demonstrated 3.37 times longer stays in out of home facilities, and those in P2 had stays 1.30 times longer than P1. When these placements were broken down by provider, profile was a significant predictor of duration remanded into custody ($\chi^2$ (2, 497) = 27.760, p < .01). Those with membership to P3 demonstrated the greatest incident rate ratios, indicating

membership to P3 is predictive of longer durations of detention. As can be seen in Appendix P, P2 was also predictive of longer detention periods, however, these were half the duration of P3's detention periods. This was the same when hospital admission was assessed ($\chi^2$ (2, 497) = 52.289, p < .01). Membership to P3 predicted extended admission periods of 7.91 times the admission period of those in P1. Similarly, membership to P2 predicted 1.5 times the duration of admission of P1 admission periods. This differed where residential care placements were concerned: whilst profile remained a significant predictor of time in residential care as whole, only P3 independently predicted duration in residential care. In contrast to other forms of out-of-home provision, when compared to P1, membership to P3 significantly predicted reduced time in residential care with an incident rate ratio of 0.06.

## The Role of MST in the Allocation of MAU

Similarly, a series of negative binomial regressions were undertaken to establish if treatment arm predicted the intensity in which MAU services were provided. The table of results, found in Appendix Q, indicated that total MAU service provision did not differ significantly, and that treatment arm was not predictive of usual service provision ($\chi^2$ (1, 483) =.084, p =.77). However, it was predictive of total CAMHS provision, ($\chi^2$ (1, 495) = 4.11, p =.05) and those within the MAU alone condition were in receipt of 1.23 times the number of total CAMHS contacts than those in the MST + MAU condition. This appeared to be particularly related to family therapy ($\chi^2$ (1, 519 = 13.49, p < .001) where those in the MAU alone condition received 1.93 times the number of family therapy sessions. There were no significant differences in provision of any other CAMHS discipline, as can be seen in the summary table located in Appendix Q.

Similarly, treatment arm was not significantly predictive of total justice service provision ($\chi^2$ (1, 492) =.71, p =.34), however, allocation to the MAU condition was

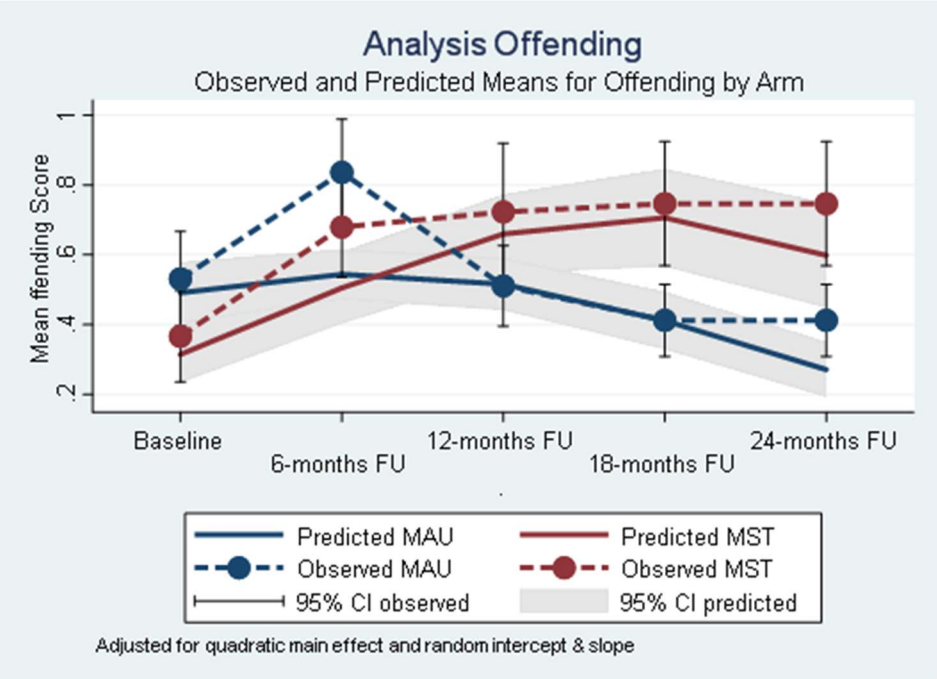
significantly predictive of greater contact with probation services ($\chi^2$ (1, 498 = 42.625, p < .001, IRR =2.59) and with youth offending team workers ($\chi^2$ (1, 498 = 21.25, p < .001, IRR=1.50). Allocation to MAU was also a significant predictor of period admitted to hospital ($\chi^2$ (1, 478 = 20.07, p < .001) or remanded into custody ($\chi^2$ (1, 464 = 8.08, p < .01). However, within this, there are differences, and allocation to MAU alone was predictive of increased admission periods (IRR=2.392) but reduced time in custody (IRR=.732) compared to the MST cohort.

## Role of Treatment and Profile on Offending Outcome

Further analyses sought to establish if offending outcomes differed for certain profiles. As only 6% of the sample were considered members of P3, there was not sufficient power to explore outcomes for these individuals, and members of P3 were excluded from this set of analyses. However, a mixed effects Poisson regression was undertaken which assessed the effect of treatment arm (MST or MAU) and profile membership (P1 or P2) on objective offending data held by the police computer national database. As the objective offending data were collected at six-monthly time points over the course of 24-months, multilevel models were considered the most appropriate assessment. Consul and Jain (1973) proposed that the generalised Poisson (GP) distribution is able to accommodate both overdispersed and underdispersed count data. Within multilevel assessments the Pearson's overdispersion statistic is used to assess the degree to which the data is over dispersed. Within the current study, the dispersion statistic was 1.7 indicating mild overdispersion. In line with Long and Freese (2001) a robust estimator was applied. Robust estimators are proposed to account for the heteroscedasticity (e.g. variability) of variables and correct the standard error for the parameter estimates. In accord, robust estimators were requested utilised to account for the heteroscedasticity of the offending variable. In doing so, reducing the risk of type 1 error that Poisson models with overdispersed data are often vulnerable to (Silva & Tenreyro, 2006; White, 1980).

Multilevel linear models were first constructed in line with the project plan, but the non-linear nature of the data resulted in poorer fit. Instead, the inclusion of quadratic terms was found to improve model fit and better account for the data. Quadratic terms, as a squared function, enable curvature to a linear model to improve model fit. Therefore, the final model included the following fixed effects: treatment arm (MST or MAU), profile (P1 and P2) and time (linear and quadratic). This provided a good model fit ($\chi$ 2 (11, 483) =101.40, p < .01). When all variables where controlled for a two-way significant interaction treatment arm and time was observed, please see Figure 4.

**Figure 4. Graph to Show Interaction Effect of Time and Treatment Arm on Offending**




This demonstrated that those in the MAU arm offended less than those in the MST arm, where mean offending was significantly lower for the MAU condition (IRR=2.11). Further to this, a significant three-way interaction between profile, arm and quadratic time was demonstrated. This indicated significant reductions in offending occurred for P2 in the MAU condition. Where those with membership to P2 in the MAU condition

offended less than those in the MST condition (IRR=1.20): please see Appendix S and T.

# Discussion

The study aimed to identify specific risk factors present within the START sample, a sample of justice-involved antisocial youth, and whether these factors impacted usual service provision. It did so by completing numerous bifactor analyses and isolating a range of specific risk factors. It established that specific risk factors clustered together, giving rise to three, statistically distinct groups of young offenders making up low-risk, moderate-risk and high-risk groups. Further to this, it confirmed that these profiles of risk were significantly predictive of service provision or utilisation where several distinct MAU provisions were considered.

## Identifying Specific Risk Factors

The study supports previous research identifying both general and specific factors contributing to child and adolescent mental health difficulties. It highlights the tendency for young people to experience symptoms of several mental health difficulties comorbidly due to a general *psychopathology* factor (Capsi et al., 2104; Caspi & Moffit, 2018; Constantinou et al., 2019; Patalay, Fonagy & Deighton, 2015; St Clair et al., 2017). However, in a novel contribution, the current study builds on this supposition, and results indicate that childhood psychosocial *"complexity"* may also be modelled in a bifactor structure. Through teasing apart the general and specific factors across a number of measures highly utilised in child and adolescent mental health services (CAMHS) it demonstrated that when these general factors, of "*psychopathology"* or "*complexity",* are controlled for, several specific factors indicative of antisocial risk were identified and correlations between these factors are diminished (Carragher et al., 2016; Caspi et al., 2014; Laceulle, Vollebergh & Ormel, 2015). For this reason, unlike previous research within the field of antisocial

behaviour, the study identifies factors which are proposed to represent “pure” risk factors that contribute to the development of antisocial behaviour.

Across all five measures, the model fit statistics were wide ranging (e.g. acceptable, good and excellent). Goodness of fit statistics indicated an excellent fit for the APQ, and good fit for the ABAS, ICU and SDQ. However, only acceptable fit was achieved for the SRD. There are several possible explanations for poor fit statistics such as those demonstrated within the SRD. First, whilst these provide an adequate explanation of the data, there is some evidence to suggest that self-reported offending peaks at age 14 and is subject to significant decline following this (Smith, 2006). Whilst the mean age of the sample was 13.8 years, it remains unclear if the measure was able to capture accurate data for the whole sample. This is likely to have contributed to the heterogeneity of the sample. Several studies have implicated sample heterogeneity as contributing to poor fit statistics. Therefore, it cannot be determined from the current study and analyses whether the factor structure would differ when utilised with specific subsections of antisocial adolescents. Authors suggest that finding sources of heterogeneity and controlling will improve such statistics, such as utilising moderator models (Antonakis, Bendahan, Jacquart & Lalive, 2010). However, one benefit of such a heterogeneous sample is that it provides an overall description of the antisocial experiences of young offenders in the UK, perhaps enhancing the generalisability of the findings (Pai et al., 2007).

Where duplicates are not considered, the final latent factors identified within the study included aggression, antisocial attitude, antisocial identity, bullied/victimised, callousness, corporal punishment, history of criminal and offending behaviour, hyperactivity, inconsistent discipline, parental monitoring, positive parenting, mood disturbance, school difficulties (disruptive), substance misuse, uncaring and unemotional traits. For clinicians interested in understanding risk factors

and other disorders associated with antisocial behaviour, the itemised factor loadings for all specific factors are available in Appendices F–M. These provide statistically identified risk indicators to clinicians working with young people, whereby highly loading items suggest high indication of risk. For example, the bifactor model of the ABAS identifies four orthogonal factors of which three are known to increase the likelihood of antisocial behaviour such as antisocial identity, antisocial attitude and aggression (Hardy, Bean & Olsen, 2015). These findings are in line with previous studies which have found comparable results in similar clinical samples and suggest that when combined as part of a clinical assessment the bifactor model of such measures may support clinicians in the identification of specific risks (Caspi & Moffit, 2018; Patrick et al., 2007; Patalay, Fonagy & Deighton, 2015; St Clair et al., 2017). In doing so, this offers an opportunity to further explore mechanisms and tools which may support clinical identification of risk as well as the underlying difficulties and unmet needs that give rise to antisocial behaviour.

## Profiling Risk

As mentioned previously, the latent profile analysis (LPA) identified three statistically reliable profiles of risk within the sample. It must be acknowledged, however, that within this one of the identified profiles represented only 6% of the sample. Across the profiles differences in risk and need can be observed: where profile one (P1) represents a group of individuals with moderate mental health concerns, profile two (P2) presents a cohort of individuals subject to poor parental monitoring, demonstrating high peer delinquency and callous traits, and profile three (P3) represents a group of individuals who identify with an antisocial identity, and experience significant mood disturbance and higher levels of aggression.

In line with previous literature, those individuals in P1 that demonstrate greater mood disorders and levels of hyperactivity also present with lower levels of antisocial cognitions. Whilst this is relative to the higher risk profiles this echoes the recent

findings of Young and Thome (2011), who found that individuals with attention deficit hyperactivity disorder (ADHD) often entered the justice system at lower ages, becoming "*revolving door recidivists"* (Young & Thome, 2011, p.4) the cause of which they attribute to missed diagnosis. The authors draw attention to the reasons such individuals are remanded into custody, highlighting that this is often because of numerous low severity offences such as drunk and disorderly. They posit that this behaviour may be as a consequence of emotional dysregulation and impulsivity of underlying and poorly managed ADHD as opposed to antisocial thinking or callous disregard for social norms.

In contrast, those in P2 appear to be a cohort with greater difficulties in the family home and increased peer delinquency. A recent publication by Kahn and colleagues (2019) posits that such difficulties with parental relations present as a major risk factor for gang membership. The authors propose that peer delinquency and gang affiliation meet the social and emotional needs of the young person which are currently neglected at home. They propose that gang affiliation fosters a sense of *"belonging"* that is not provided at home. Therefore, one possible hypothesis may be that this profile perhaps represents a group for whom *"belonging"* is central to their difficulties (Bateman, & Hazel, 2015; Gibson & Clarbour, 2017). Unlike the other profiles, this group present low prevalence of mental health difficulties. In contrast however, this group present with personality traits such as callousness and unemotional traits which are thought to be reinforced by peer delinquency, often described as *"deviancy training"* (Byrd, Hawes, Leober & Pardini, 2018, p. 468). As such, it is expected that interventions to address such difficulties would likely differ from those offered to those with membership to the other profiles and would include greater focus on the development of emotion recognition and nurturing (Pisano et al., 2017).

Results indicate that individuals within P3 present with greater antisocial attitudes and ascribe more to an antisocial identity than their peers. They present with scores indicative of aggression, engage in a greater number of self-reported offending behaviours and experience more peer rejection and bullying. For these individuals, being antisocial is something which appears to be valued, and therefore it is likely that their behaviour may be considered ego-syntonic (Maslow, 1987; Trifu, 2013). As such, profile three perhaps represents a cohort of individuals demonstrating traits of an emerging antisocial personality disorder (ASPD). In line with the literature pertaining to ASPD it is likely this group of individuals demonstrate a reduced skill in distress tolerance and therefore present with the greatest degree of mood difficulties within the sample (Sargeant, Daughters, Curtin, Schuster & Lejuez, 2011). Within this, individuals with ASPD are thought to demonstrate hyper-reactivity in emotional responding to situations that elicit distress, perhaps accounting for the greater levels of aggression within this subsample in comparison to their counterparts with callous and unemotional traits.

Whilst the profiles identified within the study are statistically distinct, it is important to recognise that LPA is a probabilistic model (Williams et al., 2016). As such, profiles are derived from an array of correlations (Stanley et al., 2017). Presently this is the most prominent critique of risk-focused research, and the risk focused prevention paradigm (RFPP). Authors suggest that its utility is often overestimated and misinterpreted as a causal: despite *"correlations between risk factors and offending telling us little about why young people behave as they do"* (Armstrong, 2006). For this reason, it is imperative that results are interpreted in a clinically informed way. In doing so, outcomes should be utilised to guide further investigation of the underlying needs of young offenders as opposed to a mechanism which further isolates a marginalised group of young people, whose experience of

exclusion is likely to increase their risk (Berridge, Brodie, Pitts, Porteous & Tarling, 2001).

## Management-as-usual and Usual Service Provision

Unfortunately, the findings of this study remain inconclusive and provide a patchy understanding of usual service provision due to the interdependence across and between multiagency services. Whilst the data indicate individuals with greater risk are likely to be in receipt of fewer services, it is remains unclear exactly what combinations of care were provided. Furthermore, whilst the study intended to consider service provision, due to the quality of recording, this is unfortunately inextricably linked with service utilisation. What can be observed is that those demonstrating greater risk at baseline, and thus gaining membership to a "higher risk" latent profile, are in receipt of significantly fewer contacts with mental health and justice services. It is possible, given service utilisation data were not available prior to baseline assessment, that individuals within this profile have already been in receipt of high levels of community care. However, the data did not allow for such hypotheses to be tested.

Where multiagency service provision was collapsed into one variable, membership to P3 was significantly predictive of intensity of service provision. Within this assessment, those demonstrating greater risk at baseline, and thus gaining membership to a "higher risk" latent profile, were in receipt of the lowest intensity of multiagency service provision. No differences were observed in total service provision between low and moderate risk individuals. However, when focused on individual services, differences emerge. Where both CAMHS and justice services are considered, profile was significantly predictive of intensity of provision. The RNR framework posits service provision should be governed by the "risk" principle where intensity of service provision should match the risk of the individual (Andrews and Bonta, 2006). Results from this assessment present with contrary findings, and in

both services individuals with membership to the “high risk” profile received the least community contacts. However, the data cannot attest to the reasons why these contacts were lower. As the data do not provide a figure for unattended contacts it is hard to ascertain if those who present with the highest risk did not attend appointments with justice services owing to difficulties with engaging in treatment as the resistive individual outlined by Tyrer and colleagues (2003). However, it is not possible to exclude the possibilities that services have been provided prior to trial commencement, something that could not be controlled for, or whether these contacts simply were not offered (Bradley, 2009; Peto, Dent, Griffin & Hindley, 2015).

Focusing on CAMHS provision, this was demonstrated across all profiles, whereas risk increased, total service provision across combined disciplines decreased. As such, membership to P2, the moderate risk group, also predicted significantly fewer contacts than membership to the lower risk profile. Despite this, where individual disciplines within CAMHS provision were considered, this differed. There were no significant differences in the number of appointments provided by psychiatry, perhaps indicating that where mental health was the primary concern, individuals were supported equally. In fact, where services were broken down into provision by discipline there is some evidence for CAMHS provision being delivered in line with a “needs based” model such as RNR (Andrews & Bonta, 2006). For example, individuals demonstrating moderate risk were more likely to be provided with comprehensive systematic interventions with a family therapist. As such it appears that this was, in part, driven by the RNR “need” principle, as those with membership to the moderate risk profile demonstrated the greatest levels of inconsistent discipline and poor monitoring within the family home. As such, it may be considered that increased provision of systemic family therapy directly targeted the underlying need that this cohort presents with (Hendricks, Lange & Boonstoppel-Boender, 2014). Similarly, whilst it was not possible to include substance misuse as

an input variable, the assessment of service provision indicates that those in P3 were in receipt of the greatest intensity of provision from substance misuse services, perhaps indicating that membership to P3 is in part due to increased substance misuse, a relationship widely reported in pervious evaluations of antisocial populations (Young, Taylor & Gudjonsson, 2012 & Young, Wells & Gudjonsson, 2010).

Where justice services were considered, membership to the moderate antisocial risk profile predicted the greatest number of contacts from all justice services, including both the Youth Offending Team (YOT) and probation services. Individuals were provided with service from YOT workers and probation but, like CAMHS services, the actual intervention provided during these contacts remains undocumented. In line with CAMHS provision, those with membership to the highest risk profile received the least community service provision by justice service, though it is important to note it was not possible to ascertain the predictive value that membership to P3 provided within this context. Due to the small class membership this analysis was not possible, due to poor confidence.

Further to this, the data suggest that membership to P3, the high-risk cohort, significantly predicted extended periods in out-of-home provision, perhaps accounting for the reduced community provision. In part this might be considered as a response to the risk they posed, either to themselves or others. On the one hand this suggests that services provided to high risk individuals are in keeping with the RNR framework (Andrews & Bonta, 2006); however, on the other, it is important to consider the impact such provisions have upon young people. It is known that detention in and of itself exacerbates existing mental health difficulties and promotes poorer outcomes in youth populations. According to the HM Chief Inspector of Prisons (2017) no provision of youth custody is safe: in fact, violence and intimidation are identified as a "*feature of life in Young Offenders Institutes*" within the UK (p.62). The result of this, at its most

extreme, has resulted in the deaths of 65 young people in youth custody in England and Wales since 2009 (Inquest, 2019). Not only does this limit the support to these young people but, owing to the nature of offences in which detention is required, gives rise to iatrogenic effects where, due to socialisation, the risk of "low-risk" individuals will increase (Robertson, 2018; Zane, Welsh & Zimmerman, 2016; Welsh & Rocque, 2014).

Due to limitations in the data, the degree of community provision available to these "high risk" individuals in advance of such detention remains unclear. On average the median number of community contacts received by this cohort was lower than all other risk profiles. Whilst services across the public sector arena promote their work in line with Every Child Matters (2003): the governmental policy promoting equity of service to every child no matter what their individual circumstances or background, it is unclear if this is delivered in practice. There are a range of hypotheses as to why this may be: first, given the level of risk that some of these young people present with it is possible that diagnostic overshadowing may play a role where antisocial risk is viewed as the primary difficulty, and mental health need is secondary to this (Bradley, 2009 & Social Exclusion Unit, 2002). It may also be possible that such individuals fall into a *"hard to reach"* category (Maguire, 2015). For a multitude of reasons these individuals may be unable to engage with current service provision, particularly when holding in mind the complex relationships these individuals have with professionals and organisational bodies (McNeill, 2006).

## The Role of MST in the Allocation of MAU

Where differences in services between treatment arms were considered, no significant differences were observed in total service provision. However, allocation to treatment arm was significantly predictive of some services and disciplines. Most notable is the differences observed in family therapy, family support work, probation and youth offending services. Across all the services, allocation to the MAU condition

alone was significantly predictive of increased service contact. This is of interest, as this increased service need appears to overlap with the mechanism of change offered by MST. From the data available, this is hard to ascertain; however, one hypothesis might be that as MST works to increase family cohesion, improving parental monitoring and supervision following treatment completion, these services were no longer necessary, accounting for the lower levels of utilisation (Henggeler, 1999). Prior to engaging with MAU services, those in the MST condition had received on average 21 hours of MST, and therefore it is possible that this support reduced the need for high levels of family support. Further to this, it may be possible to infer differences between the arms in the original trial may have been diminished due to the overlap in service provision, where MAU provided intensive family support like MST. Additional investigations should explore this further; however, findings from the original trial paper support this notion as significant group differences were observed in the APQ monitoring and supervision subsection as well as the Leober parental support scores (Fonagy et al., 2018).

## Treatment Arm, Profile and Objective Offending

When considering the results pertaining to objective offending, significant effect interaction effects were observed. Firstly, a significant interaction effect was demonstrated where treatment arm (MST or MAU) was considered over time. This is of interest, as whilst the original trial suggested that MST was no more effective than MAU at reducing recidivism (Fonagy et al., 2018) findings of the current study suggest that not only was MST no more effective, but services provided as MAU yielded better recidivism outcomes. However, there are limitations to such assertions being made. As the analysis did not include profile three (P3), the most complex cohort of young people, it is not possible to conclude efficacy. Furthermore, there are a number of factors which might influence this outcome. When service utilisation results are consulted we see that individuals in the MAU condition were more likely

to spend extended periods admitted to psychiatric hospital or incarcerated. As such, it may be hypothesised that the lower rates of offending in the MAU condition may be due to a higher portion of participants being detained, and therefore unable to engage in offending behaviour in the same way that their MST counterparts. As such, future research may aim to consider such differences, as whilst lower rates of offending are undoubtedly positive the data cannot attest to the mechanism in which this was achieved and therefore recidivism alone cannot speak to the effectiveness of MST or MAU. Further to this, where a three-way interaction effect was observed between treatment, profile and time this difference remained. Within this, those receiving MAU with membership to P2 appear to demonstrate greater improvements overtime, where not only is the mean difference of offending rate different between arms, but this difference between treatment arm is significantly larger in P2 over time when compared to P1. When considering the characteristics of those within P2, such as higher levels of peer delinquency and callous and unemotional traits, this is perhaps surprising. However, when these results are considered in the context of the service utilisation data, we see that group (e.g. MAU P2) were provided with greater levels of service provision from justice services, perhaps indicating the value of probation and offence related work in peer delinquency. It may be proposed that such findings support the notion that MAU services may have been deferentially provided based on risk and need. This supports the notion that the RNR framework might be applicable to young people's services.

## Evaluation of the Study

One strength of the study is that, to the author's knowledge, this is the first study which encompasses the use of the bifactor model and LPA to identify specific and "pure" risk factors for adolescent antisocial behaviour and develop profiles of "pure" risk and need. The use of bifactor modelling within this context has allowed for an investigation of specific and differentiating risk factors that give rise to observable

antisocial behaviour. The use of LPA offers an opportunity for an epidemiological approach to investigate how antisocial behaviours, and latent profiles of risk, may arise from specific psychosocial risk. It enables future research to approach theories of why specific “pure” risks, and their combinations, give rise to antisocial behaviour as a symptom.

However, the study is not without its limitations. One such limitation is that whilst all the measures in which the factor scores and resultant LPA variables were derived from are regularly utilised in NHS practice, and are easily accessible and replicable, there are several variables which were not included. In part, the restricted number of variables was owing to restricted sample size. As previously discussed within the result section, there is no gold standard for assessing power and sample size in LPA. In line with recent publications, the study restricted the variable inclusion to ensure power (Tein et al., 2013). However, beyond issues of power, there were other factors which limited the inclusion of all variables in the analyses. For example, the dataset does not include several patient variables such as diagnoses, school exclusion and use of pharmacological interventions due to the data being inconsistently reported within the trial. As such, there are many risk factors which could not be included in the analyses which may be expected to influence service provision and utilisation (Saunders et al., 2016). The use of additional information such as corporal punishment within the home, mental health diagnosis, school exclusions or the use of pharmacological interventions may in the future enhance the nuanced distinction of a broader range of latent profiles identified within this study. This is likely to improve outcomes, as this would enable services to consider how they might better provide care which matches the needs of the antisocial adolescents that they service.

Additionally, as discussed earlier in this discussion, the assessment of service provision provides a patchy and inconclusive assessment. Whilst this suggests that

service provision is differentially allocated based on risk and need due to the interdependence of the dependent variable, it is hard to ascertain exactly what was provided and to whom. Specifically, the study is unable to comment on the combinations of care received and the interactions of service provision from one agency to another. Furthermore, whilst data were available for the trial duration, any service provided in advance of trial commencement was not controlled for. It is therefore possible that high levels of service provision in advance of the trial commencement may also account for service provision.

Further to this, it is important to acknowledge the limits of the profiles themselves. Whilst the profiles were statistically distinct, they do not provide an overview of within subjects' change. The profiles were derived from self-reported baseline measures and it is not possible to ascertain whether profile membership was fixed over time, or if as interventions were put in place, profile membership changed. Moreover, as P3 was a small subsection of the sample it was not possible to conduct multivariate analysis between profiles, whilst profile appears to be predictive of service provision group differences are yet to be explored.

## Clinical and Research Implications

There are several clinical implications that arise from the study. First, as the study identifies specific items from widely utilised clinical assessment tools that load onto known risk factors for antisocial behaviour, it is hoped that this information might help clinicians identify specific "red flags" for antisocial behaviour. It has highlighted that antisocial young people are a heterogeneous group, and that underlying the observable disruptive behaviours that they engage in are a range of different unmet needs. Whilst the conclusions are not clear, it has shown that usual services within the UK currently operate, loosely, in line with the RNR framework despite these principles not being explicitly outlined within the national service delivery specification for antisocial adolescents (NICE, 2017).

Where service provision and utilisation are considered, it is hard to ascertain exactly what service was provided. Firstly, as the study was unable to provide a conclusive conceptualisation of MAU service provision, future studies might adopt LPA to focus on patterns of service provision for this group of young people. As highlighted within the limitations of this study, the results pertaining to service provision provide a patchy overview of multiagency provision. However, due to constraints of the data it was not possible to perform a robust multivariate analysis. One solution to such difficulties, and a way that research may wish to approach this question, is by utilising LPA to identify patterns of service provision and then considering the characteristics of patients in receipt of these differing patterns. In doing so, future research may be better offered a more robust mechanism to explore service provision removing high levels of interdependence.

Secondly, from the available data it was not possible to ascertain if service was provided and declined by the individual adolescents, or if there was a smaller number of service contacts offered to those young people at greater risk. On one hand, this might suggest there are difficulties in engaging this complex cohort of *"hard to reach"* individuals (Maguire, 2015). However, on the other hand, if appointments were not offered this may suggest services are prone to exclusion of high-risk offenders: perhaps due to diagnostic overshadowing (Bradley, 2009 Shaw et al., 2008 & Social Exclusion Unit, 2002). In either case, it is important that future research considers barriers to access for antisocial adolescents. There is emerging research suggesting that community psychology may prove a promising approach to work with such cohorts where innovative evidence-based frameworks are being developed to "reach out" to socially excluded antisocial adolescents in community spaces (Durcan, Zlotowitz & Stubbs, 2017). Currently, these have achieved some positive outcomes, including reduced recidivism, reduced reports of mental health symptomology and increased enrolment in education or employment (Stubbs & Durcan, 2017). However,

this is a controversial approach to working with antisocial young people and currently the evidence base is sparse. Future research within the area should focus on the ability to meet the complex needs of these young people in a medium that is accessible to them, emotionally, cognitively and socially. In doing so, service provision may work in line with the "responsivity" principle of the RNR framework and respond to the needs of this complex cohort of young people.

Finally, whilst the data suggest that treatment arm influenced the incident rate of offending, it is important that future research focuses on ascertaining why this was. As suggested earlier, perhaps by conceptualising profiles of service provision, particularly detention either in hospital or prison, it might be possible to draw conclusions regarding why those in the MAU condition were found to offend at lower rates overtime.

## Conclusion

In conclusion, this study aimed to explore the "pure" risk factors within a known sample of antisocial young people. It isolated a multitude of risk factors and assessed if these risks clustered together using LPA. Results demonstrated some heterogeneity within the sample, identifying three statistically distinct profiles of offenders. In doing so it highlighted that this group of individuals present with a diverse set of risks and needs. It attempted to conceptualise the services offered to these young people, and whilst able to conclude that services are differentially provided based on risk and need, further research may build on such assertions using LPA to conceptualise patterns of service provision, but also of service use accounting for unattended appointments.

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# Part Three: Critical Appraisal

Risk-Focused Research: Problems, Professional Development, Profiling and Ethics.

# Introduction

The research presented in this thesis pertains to usual service provision for antisocial adolescents, which is currently a key item policy agenda within the UK (UK Government, 2019). The systematic literature review demonstrates that usual service provision for antisocial adolescent is not "usual" at all. It highlights that management-as-usual (MAU) is largely heterogeneous and demonstrates that internationally, even within highly esteemed trials, usual service provision is often unstandardised, making it hard for inferences to be drawn and to ascertain what interventions are helpful, and for whom (Roth & Fonagy, 1996). The empirical paper further considers this. It highlights that for usual service provision to respond to the complex needs of antisocial adolescents the underlying factors which contribute to antisocial risk must first be understood. To address this, the study followed an epidemiological paradigm (Akers & Lainer, 2009). As such, the research within this thesis is considered "pure" research that is comprised of complex analytic modelling techniques as opposed to applied research techniques easily replicable within clinical settings. For this reason, this critical appraisal considers some of the conceptual, methodological and ethical issues raised throughout the research process and considers how these findings might be applied in clinical settings.

In the first section of this appraisal I will consider the motivation and drivers for the project. The second section will consider the strengths of the approach taken within this thesis with a focus on personal and professional development. The third section will provide discussion of some of the challenges of conducting a data-analytic project. This will address the practical challenges of the research process as well as conceptual and methodological issues. Additionally, ethical dilemmas regarding risk-focused research and the role it plays in policy making will be discussed. Finally, the appraisal will consider the clinical utility of such research, focusing on the clinical implications of the study and future directions for research.

## Section One: Motivation and Drivers

Within recent years there has been a rise in media reporting of youth-perpetrated violent crime. Within this, London is identified as a national "hotspot" for gang related crime, where crime including knives and sharp weapons rose 22% in 2016–17 (Straw et al, 2018). Understandably researchers, clinicians and policy makers alike are keen to establish a comprehensive method for understanding, predicting and preventing antisocial and offending behaviour. However, to make such predictions and develop preventative interventions it is essential that the factors underlying antisocial behaviour are understood. Across all policy documentation pertaining to antisocial youth there is a drive for the mechanisms underlying such behaviour to be understood (Home Office, 2004, p.6; UK Government, 2018). For this reason, I was keen to engage with a project that aimed to do just that. Personally, and professionally, this appealed to me as not only was the project focused on a socially excluded, and often forgotten clinical population I am passionate about (Odgers, Robins & Russell, 2010), but it provided an opportunity to develop skill that is beyond the scope of work within a typical clinical context engaging with secondary data analysis.

Secondary data analysis accounts for fewer than 42% of all papers that utilise numeric methods (Smith, 2008). However, within child and adolescent mental health, secondary data analysis is promoted due to the plentiful advantages it presents, including reduced costs (Rew, Koniak-Griffin, Lewis, Miles & O'Sullivan, 2000). By using the START dataset I was provided an opportunity that would not have been possible had I collected the data myself. Due to the magnitude of the dataset I was able to ask, and begin to answer, questions that would traditionally be beyond the scope of a D.Clin.Psy project. Whilst there are several benefits to engaging in doctoral research that involves data collection (e.g. understanding of ethics processes, recruitment and the investigation of novel research questions) they can also present with limitations. Specifically, such projects are often underpowered and run the risk

of contributing to the existing body of underpowered psychological research (Marszalek et al., 2011). As the thesis focused on the evidence-base and exploring the impact research design has on outcomes, I was keen to avoid this.

## Section Two: Approach and Professional Development

Within the field of antisocial behaviour, offending and forensic psychology risk-focused research dominates the evidence base. As its title suggests, risk-focused research is concerned with identifying and isolating common risk factors for an observed outcome of concern. The empirical paper within this thesis took its roots in risk-focused research and aimed to apply an epidemiological approach to understanding risks and needs that contribute to antisocial risk, membership to risk profiles and ultimately service provision. Farrington (2000) proposes that the benefit of such research is its ability to isolate specific risk factors, therefore enabling research and clinical practice to target interventions and counteract these risks, ultimately improving outcomes. This approach to offending and antisocial behaviour, as discussed earlier in this thesis, is called the risk factor prevention paradigm (RFPP).

As the project adopted an epidemiological approach, in line with RFPP, to understand the relationship of risk and need, it offered the opportunity to gain skills in advanced analytic modelling. However, owing to the advanced level of statistical modelling, it involved learning several new techniques including coding syntax, bifactor modelling, latent profile analysis and nonparametric assessment of count data. Prior to the project I had limited knowledge of any of these processes. However, through this process I have increased both my knowledge and confidence in data analysis, having learned how to use a number of statistical packages, including Mplus, Stata and SPSS (IBM Corp, 2016; Muthén & Muthén, 2018; Stata Corp, 2017). In doing so I have been made aware of the complexities of working with secondary

data, large data, and data that is routinely recorded in clinical services (Adibuzzaman, DeLaurentis, Hill & Benneyworth, 2017). Personally, I believe these skills will continue to be of great benefit within my professional career, particularly in the social context of payment by results and the push towards routine data collection.

## Section Three: Challenges, Compromises and Ethics

Unlike data reported in experimental contexts, secondary data analysis presents with a range of challenges which extend from practical processes and methodological compromises to ethical and philosophical challenges. As I encountered several challenges across these domains I will discuss them each in turn.

## Practical and Process

The greatest challenge this project posed was challenges to practical processes. Prior to engaging with this project, my statistical knowledge was limited, and as such, to begin this project I first had to learn both the theory underpinning an array of statistical techniques as well as how to implement them using new and unfamiliar statistical packages (e.g. exploratory factor analysis, confirmatory factor analysis, bifactor analysis, Monte Carlo simulation, latent profile modelling and negative binomial regression and mixed effects Poisson regression in Mplus, Stata and SPSS).

Initially upon project conception, to tackle this somewhat daunting prospect, I developed a staged approach to learn all the techniques. I had intended to begin the process by familiarising myself with relevant literature. In doing so I hoped to consider the best analytical approach to address my question, taking on board the challenges other researchers had identified (Trinh, 2018; Tripathy, 2013). Following this, my plan was to learn the principles behind each chosen approach, ensuring a theoretic understanding of the modelling process before learning how to use the software packages required to complete the analysis and apply the various techniques. However, these stages often overlapped, and I was often trying to learn about a

technique whilst applying it. In part, this was due to challenges encountered with the data resulting in changes to the analytic plan. In some ways this was an inefficient approach: I found that as my understanding had grown and developed by learning more about the techniques, I realised I had previously made mistakes and had to rerun analyses. Whilst this was in some ways counterproductive it highlighted to me the professional development that had been made. The process of encountering errors and learning from them was of great value. I was afforded the opportunity to learn from my mistakes, to check my work and troubleshoot where things had gone wrong in line with error-based learning, where learning takes place through identification of errors, establishing how to correct these whilst maintaining the strengths of the work (Metcalfe, 2017).

Furthermore, there were several challenges that I had not foreseen. Firstly, I had not foreseen the number of hours that a data-analytic project would amass. Despite working to a planned timeline, I found that I had underestimated the time that some tasks would take. For example, some papers highlighted the need to utilise methods which penalised models for levels of complexity when adopting a bifactor model (Constantinou et al., 2019; Simpson, Rue, Martins, Riebler & Sorbye, 2015). To do this, the model estimator is changed and maximum likelihood ratio (MLR) tests are conducted to gain information criterion statistics. On the surface this appears a simple task, given the model has already been identified, however owing to the available technology (e.g. laptop with four processors) the running of each of the 32 models took a substantial time. Whilst ensuring a more comprehensive model fit statistics this ultimately contributed minimally to the overall project (Muthén, 2001). Despite the MLR ensuring the assessment was robust, these results were often in line with the results from the weighted least squared mean variance (WLSMV) assessment.

Secondly, over the course of the project there was a change in supervisor towards the end of second year. This presented both benefits and challenges. Working with a new supervisor meant there were changes to the analytic plan which meant learning new processes. However, this was also a great benefit as it resulted in the incorporation of other perspectives which brought new knowledge.

More personally, as the project involved a high number of complex data analytic techniques it in some ways reduced the available avenues of support (e.g. peer support), and it resulted in a greater level of lone working. This highlighted to me the benefits of working within teams when confronted with complex information, as often at times where theoretic, conceptual or methodological dilemmas presented, I was left with a feeling of "stuckness". However, Daniels and Feltham propose that *"in every personal development endeavour there is some notion of difficulty, defence mechanism, resistance and stuckness"* (2004, p.182). Despite this, I enjoyed the work, as where such dilemmas presented there was a tremendous level of satisfaction experienced when troubleshooting overcame such difficulties and I was able to discuss this in research supervision (Milne, 2007).

## Methodological and Conceptual Challenges

Over the course of the project there were several methodological challenges that arose, and a number of compromises were made as a result. First, as the sample size was predefined there were times where to ensure a level of statistical power, data of interest had to be excluded (Cohen, 1988). This is perhaps a primary limitation of the study, as despite the bifactor analyses identifying numerous underlying constructs it was not possible to include all of these within the profile analysis (Tein et al., 2013). When conducting secondary data analysis this presents as a challenge in which there is little that can be done given the trial has ended. However, there are two approaches available to researchers undertaking secondary data analysis: the 'research question-driven' approach and the 'data-driven' approach (Cheng &

Phillips, 2014). The empirical paper within this thesis followed the research question approach, where researchers approach the data with an *a priori* hypothesis or a question in mind and seek to answer this based on the data they can access. In contrast, the 'data-driven' approach seeks to establish what questions can be answered by the available data by looking at the available data in advance of data formation. To avoid challenges of sample size and power, a 'data-driven' approach may be of greater utility. However, the project that forms Part Two of this thesis followed a question driven approach to avoid all possibilities of *"data mining"* (Trinh, 2018) and as a result there were several occasions where the analytic plan was adapted and modified considering the available data.

Further challenges and methodological dilemmas arose due to the quality of the service provision and utilisation data. These data represented routinely collected data and was collected from the multiple agencies working across the nine trial sites. As documented within several papers, routinely collected clinical data are often *"patchy"* and non-normal (Diaz Ordaz & Grieve, 2019). This presents as another limitation of the secondary data approach: as the researcher, I was not involved in the data collection process and therefore I was subsequently unaware of the study-specific nuances which may be important to interpretation. This is particularly relevant to the service provision and utilisation data, where it remained unclear to me, as the researcher, how many appointments were offered but not attended as the data were zero inflated.

Due to the zero inflation of the data it did not meet normality assumptions and therefore attempts were made to transform the data, using both log transformation and square root transformation. Despite efforts to transform, the data remained non-normal, where both skewness and kurtosis were above acceptable levels and the Kolmogorov-Smirnov normality test remained significant. This presented with additional methodological considerations: as the data were nonparametric it might be

assumed the most appropriate method of assessment would be utilising nonparametric tests such as Mann Whitney U, however such tests are considered less robust and powerful assessments owing to their use of rank order (Smalheiser, 2017). This is particularly pertinent when considering service utilisation data, where often the datapoints are over dispersed where the range is greater than the mean. To address this, negative binomial regression (NBR) was utilised. As discussed earlier, NBR is a method of assessing overly dispersed count data through its inclusion of a dispersion parameter (Greene, 1994). Unlike the use of nonparametric tests, NBR has been demonstrated to reduce the likelihood of type 1 error (Luo & Qu, 2013). This enabled comparison of predictive values of profile membership and treatment arm allocation. However, this did not enable comparisons between the array of multiagency service provisions, and whilst it was possible to see if membership to one profile increased their contacts from one agency it did not provide dynamic view of service provision. Attempts were made to rectify this by collapsing all contacts into an overarching "total multiagency provision" variable. However, as discussed within the clinical and research implications section of the empirical paper, an alternative solution to such difficulties might have been to take a "data-driven" approach. By approaching the data from this angle, it may have been possible to provide a more comprehensive overview of services available to antisocial adolescents. Such an approach may have included the use of latent profile analysis to conceptualise patterns of service provision. Once such patterns had been established, analysis may have considered the differences in patient characteristics between patterns of service provision.

Moreover, as the project was removed from a traditional clinical setting, I was mindful that it was of high importance to approach all decisions through a clinical lens to ensure that, despite the project being "pure" research, it was clear and had clinical application. For example, when the project was initially conceptualised, I did not

intend to include bifactor analysis. Rather, I had planned to use the subscale scores from measures, informed by the literature, in the latent profile analysis (LPA). Reflecting on this, from a clinical perspective, led to the question “who will this benefit?”. LPA, whilst a promising method for collating groups of patients based on similar characteristics, is not something that is easily reproduced in clinical settings. For the results of this study to be meaningful it was important to break this down. The use of bifactor modelling enabled this, as it took clinically relevant measures and was able to isolate items of significance that formed the basis of the profile analysis. In turn, this allows clinicians to consider class membership based upon presence of these items, looking out for particular items as highly loading risk indicators such as “Your parents slap you when you have done something wrong”, λ =.93, “How often have you hit, spat or thrown stones at them in the last year”, λ = .77, “I am not expressive or emotional”, λ = .73, “I worry a lot”, λ =.71, “I do not care about getting in trouble”, λ =.65 and “Bullied by someone ignoring you on purpose or leaving you out of things”, λ =.65.

## Ethical and Philosophical Challenges

Outside methodological and conceptual considerations there are also ethical issues that arise when engaging with risk-focused secondary data analysis. Over the course of the project I became increasingly aware of the uses of risk-based research, and as a result found myself challenged by some of the implicit epistemological assumptions associated with it. It struck me how that, when working within societies and services which operate within the evidence-based practice (EBP) paradigm, this is of great importance. EBP, as discussed within part one of this thesis, refers to a model of practice most commonly defined as “*the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research”* (Sackett, Rosenberg, Gray. Haynes &

Richardson, 1996, p.71). As such, contributions to the evidence base by researchers can directly influence clinical practice and the care received by individuals.

However, in recent years, and following the World Health Organisation's (WHO) publication *World Report on Knowledge for Better Health: Strengthening Health Systems* (2004) and *Knowledge for Better Health: A conceptual framework and foundation for health research systems* (2004), the influence of the evidence base and resultant EBP has extended beyond the scope of medical and health services and is now incorporated in governmental policy, policing and social care processes. Over the last 25 years, the integration of health, and more particularly mental health, research into governmental policy pertaining to antisocial behaviour has increased, giving rise to documents such as the *Serious Violence Strategy* (UK Government, 2018), *Transforming Youth Custody* (MoJ, 2014) and *More Effective Responses to Antisocial Behaviour* (Home Office, 2011). This means that the evidence base no longer influences clinical practice and care alone, but is now a tool used to shape legislation, policy and the subsequent social norms and discourses that shape society. For this reason, it is imperative that interpretation of results is in context of its limitations, particularly its correlational nature (Cheng, 1997; Thornberry, Krohn,, Lizotte, Smith & Tobin, 2003).

In line with this, when approaching this study, I was mindful that it is correlational in nature and, held at the heart of the project, was the aim of "profiling" young people. I noticed as I continued the research that I had begun to question how this approach to research fitted with my personal ethical beliefs (Coughlin, 2006; Doucet & Mauther, 2002). Whilst completing the project, I was on placement both in a high secure custodial setting and within a pupil referral unit working with young offenders. Working within these environments I heard first-hand the narratives that developed around these young people and began to question the ethical impacts of applying LPA to cohorts of already marginalised individuals, in a socio-political

context of increasing stop and search powers (Bradford & Loader, 2016; Equality and Human Rights Commission, 2010; Tiratelli, Quinton & Bradford, 2018). My concern was that such research may not meet with the ethical principle of beneficence, which stipulates that the potential benefits to both the individual and society are maximised whilst harms are minimised (Beauchamp & Childless, 1996). I found myself questioning if such research might further contribute to the negative social discourse surrounding these young people that they are "too risky", "dangerous" or at worst "hopeless" (Jones, 2013; Omaji, 2003). Case (2007) proposed, through evaluation of RFPP, that this is one of the greatest risks the paradigm poses. He suggests that data from risk-focused research is often subject to political manipulation. Whilst identifying the underlying needs of this population is undeniably of grave importance and has the potential to benefit the individual and society, I worry it also has a danger of compounding existing risk factors such as social exclusion (Case, 2006). The RFPP offers a great deal to the evidence base; however, its focus is often on risk as opposed to need. As such, it is imperative that the findings from this empirical investigation, and all risk-focused research, must be considered tentatively (Cheng, 1997) and interpreted with a clinical eye where risk may be considered an expression of need in line with Wise and Harrison's assertion that "risk" must acknowledge adolescents' "*vulnerability"* from adults as opposed to their "*dangerousness"* to them (Wise & Harrison, 2005).

## Section Four: Clinical and Research Implications

As outlined in the implications section within Part Two of this thesis, the current study has highlighted several questions and directions for future research. The study was able to identify profiles of risks and needs within a sample of antisocial adolescents and it further aimed to assess if service provision was differentially provided based upon risk and need. Whilst highlighting that service provision appears differentially allocated, it was unable to provide a comprehensive overview of multiagency service

provision. The project has demonstrated that usual services for this population vary tremendously even within the context of randomised controlled trials. Future research might focus on conceptualising routine provisions to better understand how this group of young people are supported within the community, focusing particularly on the theoretic underpinning of such provisions and how these meet the need of this complex cohort.

# Conclusion

In conducting this research, I was afforded the opportunity to engage with a large dataset from an established randomised controlled trial. Due to the magnitude of the dataset I was able to ask, and begin to answer, questions that would traditionally be beyond the scope of a D.Clin.Psy project. In doing so I have become familiar with several research paradigms, such as the RFPP and epidemiological profiling. I have had the chance to build my theoretic understanding of such paradigms as a clinician consuming the evidence base, but also as a researcher engaging with the complexity of large data making methodological decisions in line with guidance in the field.

As discussed in Section Three of this appraisal, whilst completing this thesis I have simultaneously been engaged in clinical care with young offenders. I have felt privileged to hear the stories of these young people, and to listen to their perspectives and views on current service provisions. In doing so I have always considered how the findings of my research could relate to the real-life clinical experience of young offenders. When I began this project I was keen to identify profiles of young people as a method to understand their needs; however, over time working with these young people and hearing the narratives that develop around them, I realise that whilst this may help identify underlying needs, this also may be used as a further mechanism of exclusion, where young people gain the label “high risk” or “too risky” (Pratt, Piper, Appleby, Webb & Shaw, 2016). This joint experience supported my ability to reflect

on the symbiotic relationship that clinical practice and research share, particularly in relation to complex and niche cohorts. Since completing this project, I have secured a post in a children and young people's service (CYPS), and I hope to bring these findings to the role and think about how I might adapt my practice to meet the needs of diverse adolescent populations.

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# Appendices

## Appendix A: Search Strategy for Database Searches

Search strategy utilised in OVID PSYCHINFO and OVID MEDLINE:

| | |
|---|---|
| 1 | Treatment Effectiveness Evaluation/ |
| 2 | exp Treatment Outcomes/ |
| 3 | PLACEBO/ |
| 4 | (placebo* or random* or "comparative stud*" or (clinical adj3 trial*) or (research adj3 design) or (evaluat* adj3 stud*) or (prospectiv* adj3 stud*) or ((singl* or doubl* or trebl* or tripl*) adj3 (blind* or mask*))).mp. [mp=title, abstract, heading word, Table of contents, key concepts, original title, tests & measures] |
| 5 | 1 or 2 or 3 or 4 or "5".mp. [mp=title, abstract, heading word, Table of contents, key concepts, original title, tests & measures] |
| 6 | ("Multisystemic Therap*" or "multi-systemic therap*").mp. [mp=title, abstract, heading word, Table of contents, key concepts, original title, tests & measures] |
| 7 | 5 and 6 |

Search strategy utilised in Web of Science:

TS=("multisystemic therap*" or "multi-systemic therap*")

AND TS=(placebo* or random* or "comparative stud*" or (clinical NEAR/3 trial*)

or (research NEAR/3 design)

or (evaluat* NEAR/3 stud*)

or (prospectiv* NEAR/3 stud*)

or ((singl* or doubl* or trebl* or tripl*) NEAR/3 (blind* or mask*))

## Appendix B: Quality Assessment Summary Table

### Summary Table to show quality assessment of all included articles

| Study | Year | Sample Size (n) | CONSORT Items Adhered to (n) | Overall Quality Score | Study Quality | Rating |
|---|---|---|---|---|---|---|
| **1. Asscher et al.**<br><br>A randomized controlled trial of the effectiveness of multisystemic therapy in the Netherlands: post-treatment changes and moderator effects | 2013 | 156 | 23 | .62 | ** | Good |
| **2. Borduin et al.**<br><br>Multisystemic Treatment of Serious Juvenile Offenders: Long-Term Prevention of Criminality and Violence | 1995 | 176 | 18 | .49 | * | Weak |
| **3. Borduin, Henggeler, Blaske & Stein**<br><br>Multisystemic Treatment of Adolescent Sexual Offenders | 1990 | 16 | 13 | .35 | * | Weak |
| **4. Borduin, Schaeffer & Heiblum**<br><br>A Randomized Clinical Trial of Multisystemic Therapy with Juvenile Sexual Offenders: Effects on Youth Social Ecology and Criminal Activity | 2009 | 48 | 26 | .70 | *** | Strong |
| **5. Brunk, Henggeler & Whelan**<br><br>Comparison of Multisystemic Therapy and Parent Training in the Brief Treatment of Child Abuse and Neglect | 1987 | 33 | 15 | .41 | * | Weak |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6. Butler, Baruch, Hickey & Fonagy**<br><br>A Randomized Controlled Trial of Multisystemic Therapy and a Statutory Therapeutic Intervention for Young Offenders | 2011 | 108 | 29 | .78 | *** | Strong |
| **7. Ellis et al.**<br><br>Use of Multisystemic Therapy to Improve Regimen Adherence Among Adolescents with Type 1 Diabetes in Poor Metabolic Control: A Pilot Investigation | 2004 | 31 | 22 | .59 | ** | Good |
| **8. Ellis et al.,**<br><br>Use of Multisystemic Therapy to Improve Regimen Adherence Among Adolescents with Type 1 Diabetes in Chronic Poor Metabolic Control | 2005 | 127 | 24 | .65 | ** | Good |
| **9. Ellis et al.**<br><br>Multisystemic Therapy Compared to Telephone Support for Youth with Poorly Controlled Diabetes: Findings from A Randomized Controlled Trial | 2012 | 146 | 27 | .73 | *** | Strong |
| **10. Fonagy et al.**<br><br>Multisystemic therapy versus management-as-usual in the treatment of adolescent antisocial behaviour (START): a pragmatic, randomised controlled, superiority trial | 2018 | 684 | 34 | .92 | *** | Strong |
| **11. Glisson et al.**<br><br>Randomized Trial of MST and ARC in a Two-Level EBT Implementation Strategy | 2010 | 560 | 26 | .70 | *** | Strong |

| | | | | | | |
|---|---|---|---|---|---|---|
| **12. Henggeler et al.,**<br><br>Juvenile Drug Court: Enhancing Outcomes by Integrating Evidence-Based Treatments | 2006 | 161 | 27 | .73 | *** | Strong |
| **13. Henggeler, Melton & Smith**<br><br>Family preservation using multisystemic therapy: An effective alternative to incarcerating serious juvenile offenders. | 1992 | 96 | 18 | .49 | * | Weak |
| **14. Henggeler, Melton, Brondino, Scherer & Hanley**<br><br>Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination | 1997 | 155 | 19 | .51 | * | Weak |
| **15. Henggeler, Pickrel & Brondino.**<br><br>Eliminating (almost) treatment dropout of substance abusing or dependent delinquents through home-based multisystemic therapy. | 1996 | 118 | 14 | .38 | * | Weak |
| **16. Henggeler et al.**<br><br>Home-Based Multisystemic Therapy as an Alternative to the Hospitalization of Youths in Psychiatric Crisis: Clinical Outcomes | 1999 | 116 | 25 | .68 | ** | Good |

| | | | | | | |
|---|---|---|---|---|---|---|
| **17. Letourneau et al.**<br><br>Multisystemic Therapy for Juvenile Sexual Offenders: 1-Year Results from a Randomized Effectiveness Trial | 2009 | 127 | 24 | .65 | ** | Good |
| **18. Letourneau et al.**<br><br>Multisystemic therapy for poorly adherent youth with HIV: Results from a pilot randomized controlled trial | 2012 | 34 | 22 | 0.59 | ** | Good |
| **19. Naar-King et al.**<br><br>A randomized pilot study of multisystemic therapy targeting obesity in African-American adolescents. | 2009 | 48 | 23 | .62 | ** | Good |
| **20.Naar-King et al.**<br><br>Multisystemic Therapy for High-Risk African American Adolescents with Asthma: A Randomized Clinical Trial | 2014 | 170 | 31 | .84 | *** | Strong |
| **21. Ogden & Halliday - Boykins**<br><br>Multisystemic Treatment of Antisocial Adolescents in Norway: Replication of Clinical Outcomes Outside of the US | 2004 | 100 | 22 | .59 | ** | Good |
| **22. Rowland et al.**<br><br>A Randomized Trial of Multisystemic Therapy with Hawaii's Felix Class Youths | 2005 | 31 | 24 | .65 | ** | Good |
| **23. Sundell et al.** | 2008 | 156 | 30 | .81 | *** | Strong |

| | | | | | | |
|---|---|---|---|---|---|---|
| The Transportability of Multisystemic Therapy to Sweden: Short-Term Results from a Randomized Trial of Conduct-Disordered Youths | | | | | | |
| **24. Swenson et al.,**<br><br>Multisystemic Therapy for Child Abuse and Neglect: A Randomized Effectiveness Trial | 2010 | 86 | 28 | .76 | *** | Strong |
| **25. Timmons – Mitchell, Bender, Kishna & Mitchell**<br><br>An Independent Effectiveness Trial of Multisystemic Therapy with Juvenile Justice Youth | 2006 | 93 | 23 | .62 | ** | Good |
| **26. Weiss et al.,**<br><br>An Independent Randomized Clinical Trial of Multisystemic Therapy with Non-Court-Referred Adolescents with Serious Conduct Problems | 2013 | 164 | 25.00 | .68 | ** | Good |

## Appendix C: Ethical Approval

**South East Research Ethics Committee**
South East Coast Strategic Health Authority
Preston Hall
Aylesford
Kent
ME20 7NJ

Telephone: 01622 713097
Facsimile: 01622 885966

20 May 2009

Professor Peter Fonagy
Freud Memorial Professor of Psychoanalysis and Head of the Research Department of Clinical, Educational and Health Psychology, University College London
University College London
Psychoanalysis Unit
1-19 Torrington Place
UCL
WC1E 7HB

Dear Professor Fonagy

**Full title of study:** **START (Systemic Therapy for At Risk Teens): A National Randomized Controlled Trial to Evaluate Multisystemic Therapy in the UK Context**
**REC reference number:** **09/H1102/55**

The Research Ethics Committee reviewed the above application at the meeting held on 13 May 2009.

After the Committee's initial deliberations on your application, yourself and Dr Butler kindly joined the meeting to clarify some issues. Thank you for taking the time to do so. The following issues were clarified during the discussion:

**Q** **Can you deliver this? It is a very intensive process with many contacts with members of families. Do you have enough resources?**

A There is clinical provision in place within the ten established sites. A government grant of £10million has been awarded to this project. All staff have already been recruited for the ten sites. Seven sites have staff employed by NHS agencies and three have staff employed by local authorities. Collaboration was demonstrated in order to gain the funding. All systems necessary have already been developed. The study will be monitored very carefully to ensure intervention is properly delivered.

**Q** **Has risk assessment taken into account that you may not be able to undertake the project exactly as per the proposal?**

A One of the outcome variables is to expect site-specific differences and this should be the guiding principle of any government national roll-out.

**Q** **In the power calculation you have allowed for differences in sites, but vulnerable young people come from different sources. There will be a multifaceted group receiving the intervention. Has this been taken into account?**

A The power calculation is based on the success rates of the USA and Norway studies primarily recruited from offender centres. There are no figures to inform the power calculation, although most young people will probably be the same regardless of the service they come from. They will all be diligent rejecters from an early age and we have factored in that they may respond less well. Randomisation has been agreed by the funders.

The Committee were very impressed with the thought that had gone into the study, and the helpful attendance of two of the most senior members of the team; and noted that it was very helpful to have received comments from the study reviewers.

**Ethical opinion**

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

**Conditions of the favourable opinion**

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission at NHS sites ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

**Approved documents**

The documents reviewed and approved at the meeting were:

| *Document* | *Version* | *Date* |
|---|---|---|
| The Revised Conflict Tactics Scales (CTS2) | | |
| Beliefs and Attitudes Scale | | |
| The Development and Well-Being Assessment - Parent Interview | | |
| The Development and Well-Being Assessment - Interview with 11-17 year olds | | |
| Insurance Certificate | | 01 July 2008 |
| Participant Consent Form: Young Person | 1.1 | 07 April 2009 |
| Participant Information Sheet: Parent or Carer | 1.1 | 07 April 2009 |
| Participant Information Sheet: Young People aged 15-17 | 1.1 | 07 April 2009 |
| Participant Information Sheet: Young People aged 11-14 | 1.1 | 07 April 2009 |
| Questionnaire: Strengths and Difficulties Questionnaire | | |
| Questionnaire: The University of New Orleans Alabama Parenting Questionnaire (APQ) | | |
| Questionnaire: Short Mood and Feelings Questionnaire | | |
| Questionnaire: The General Health Questionnaire | | |
| Questionnaire: Young Person's Questionnaire Booklet | | |
| Peer Review | | |
| Letter from Sponsor | | 04 April 2009 |

| | | |
|---|---|---|
| Covering Letter | | 08 April 2009 |
| Protocol | 1.0 | 30 March 2009 |
| Investigator CV | Professor Peter Fonagy | |
| Application | | 07 April 2009 |
| Conners' Teacher Rating Scale - Revised (S) | | |
| ICU (Youth Version) | | |
| ICU (Parent Version) | | |
| LEE scale | | |
| The McMaster Family Assesment Device | | |
| WASI Record Form | | |
| The Child Attachment Interview (CAI) Protocol | | |
| Participant Consent Form: Parent/Carer | 1.1 | 07 April 2009 |
| Participant Consent Form: Optional Additional Qualitative Study - Parent/Carer | 1.1 | 07 April 2009 |
| Participant Information Sheet: Optional Additional Qualitative Study Information for Parents | 1.1 | 07 April 2009 |
| Development and Well-being Assessment (Teacher Version) | | |

**Membership of the Committee**

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

Professor Katona and Dr Bhiman both declared a non-specific, non-personal interest in the study. Members agreed that Professor Katona and Dr Bhiman could remain in the meeting and contribute to the review of the study.

**Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

**After ethical review**

Now that you have completed the application process please visit the National Research Ethics Website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

| 09/H1102/55 | Please quote this number on all correspondence |
|---|---|

With the Committee's best wishes for the success of this project

Yours sincerely

**Dr L. Alan Ruben**
**Chair**

Email: nicki.watts@nhs.net

*Enclosures:* *List of names and professions of members who were present at the meeting and those who submitted written comments*
*"After ethical review – guidance for researchers"*

*Copy to:* *Dr O Awwenagha*

**Appendix D: Measures**

APQ:

## Short Form of the Child Alabama Questionnaire

*(Please tick **one** box in each row)*

| | | Never | Almost Never | Sometimes | Often | Always |
|---|---|---|---|---|---|---|
| 1. | Your parents tell you that you are doing a good job | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 2. | Your parents threaten to punish you and then do not do it | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 3. | You go out without leaving a note or letting your parents know where you are going | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 4. | You play games or do other fun things with your mum | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 5. | You talk your parents out of punishing you after you have done something wrong | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 6. | Your mum asks you about your day in school | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 7. | You stay out in the evening past the time you are supposed to be home | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 8. | Your mum helps you with your homework | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 9. | Your parents compliment you when you have done something well | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 10. | Your parents praise you for behaving well | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| 11. | Your parents do not know the friends you are with | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12. | Your parents let you out of a punishment early (like lift restrictions earlier than they originally said) | ☐1 | ☐2 | ☐3 | ☐4 | ☐5 |
| 13. | Your parents spank you with their hand when you have done something wrong | ☐1 | ☐2 | ☐3 | ☐4 | ☐5 |
| 14. | Your parents slap you when you have done something wrong | ☐1 | ☐2 | ☐3 | ☐4 | ☐5 |
| 15. | Your parents hit you with a belt or other object when you have done something wrong | ☐1 | ☐2 | ☐3 | ☐4 | ☐5 |

ABAS:

# BELIEFS AND ATTITUDES SCALE

| BELIEFS AND ATTITUDES SCALE | | | | |
|---|---|---|---|---|
| INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | | **Agree** | **Not Sure** | **Disagree** |
| 1 | Judges are honest and kind. | A | NS | D |
| 2 | The law is good. | A | NS | D |
| 3 | It's OK to stay out late without parents' permission. | A | NS | D |
| 4 | The law does not help the average person. | A | NS | D |
| 5 | You cannot be treated fairly in court. | A | NS | D |

**BELIEFS AND ATTITUDES SCALE**

| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
|---|---|---|---|---|
| 6 | It's fun and exciting to belong to a gang. | A | NS | D |
| 7 | I'd feel pretty bad if I broke the rules at my school. | A | NS | D |
| 8 | Teenagers have to lie so they don't get into trouble. | A | NS | D |
| 9 | Bullying my mother helps me get what I want. | A | NS | D |
| 10 | We'd be better off if there were more police. | A | NS | D |
| 11 | I think people are always trying to get me into trouble. | A | NS | D |
| 12 | It's none of parents' business what a young person does after school. | A | NS | D |
| 13 | The police almost never help people. | A | NS | D |
| 14 | Fighting is cool when you're with a group of teenagers. | A | NS | D |
| 15 | Court decisions are almost always fair. | A | NS | D |
| 16 | It's OK to lie to your parents as long as you don't get caught. | A | NS | D |
| 17 | I don't like having to obey all the rules at home and school. | A | NS | D |
| 18 | I am very different from teenagers who never get into trouble. | A | NS | D |

**BELIEFS AND ATTITUDES SCALE**

| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
|---|---|---|---|---|
| 19 | The police are honest. | A | NS | D |

**BELIEFS AND ATTITUDES SCALE**

| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
|---|---|---|---|---|
| 20 | Blaming other teenagers is a good way to avoid getting into trouble. | A | NS | D |
| 21 | I'm afraid to hang around with young people who get into trouble. | A | NS | D |
| 22 | It's OK to break the law if you don't get caught. | A | NS | D |
| 23 | Curfews help teenagers stay out of trouble. | A | NS | D |
| 24 | It's OK to walk away from a fight. | A | NS | D |
| 25 | I'd take a car for a joyride if I wouldn't get caught. | A | NS | D |
| 26 | A hungry man has the right to steal. | A | NS | D |
| 27 | Being in a gang stops you from getting picked on. | A | NS | D |
| 28 | | A | NS | D |

**BELIEFS AND ATTITUDES SCALE**

| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
|---|---|---|---|---|
| | You have to let other teenagers know that they can't push you around. | | | |
| 29 | I respect teenagers who listen to their parents. | A | NS | D |
| 30 | Sometimes you have to use younger children when you break the law. | A | NS | D |
| 31 | It's not right to take money from a younger child. | A | NS | D |
| 32 | Some young people deserve to be picked on. | A | NS | D |
| 33 | Young people have to lie to get what they want. | A | NS | D |
| 34 | Students shouldn't talk answer the teacher back. | A | NS | D |
| 35 | Life would be better with fewer police. | A | NS | D |
| 36 | Sometimes you have to break the law to get what you want. | A | NS | D |
| 37 | Young people have to steal to get nice things. | A | NS | D |
| 38 | You're crazy to work for a living if there's an easier way, even if you have to break the law. | A | NS | D |
| 39 | I like to be with young people who obey the law rather than young people who break it. | A | NS | D |
| | | | | |

**BELIEFS AND ATTITUDES SCALE**

| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
|---|---|---|---|---|
| 40 | Teenagers who get into trouble think like me. | A | NS | D |
| 41 | It's OK to swear at your mother when she treats you unfairly. | A | NS | D |
| 42 | Sometimes it's good to carry a weapon to protect yourself. | A | NS | D |
| 43 | You shouldn't threaten to hurt teachers, even if they are always bugging you. | A | NS | D |
| 44 | Lawyers are honest | A | NS | D |
| 45 | Young people who break the law think like me. | A | NS | D |
| 46 | If my mother tried to get me into big trouble, I'd threaten to hurt her. | A | NS | D |
| 47 | You have to hurt the other person before he hurts you. | A | NS | D |
| 48 | If you have enough money, you can get what you want in court. | A | NS | D |
| 49 | It's no big deal to skip a few lessons. | A | NS | D |
| 50 | Teenagers feel better when they know they can win a fight. | A | NS | D |
| 51 | Breaking the law can be exciting. | A | NS | D |
| 52 | Teenagers shouldn't hang out at the shops or in the park during school time. | A | NS | D |

**BELIEFS AND ATTITUDES SCALE**

| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
|---|---|---|---|---|
| 53 | Teachers have a right to tell students what to do. | A | NS | D |
| 54 | The police are as crooked as the people they arrest. | A | NS | D |
| 55 | It's OK to bend the law as long as you don't break it. | A | NS | D |
| 56 | The police should be paid more for their work. | A | NS | D |
| 57 | You should always obey the law, even if it stops you from getting what you want. | A | NS | D |
| 58 | It's OK to push or shove your parents if you really lose your temper. | A | NS | D |
| 59 | I'm more like teenagers who break the law than people who don't break it. | A | NS | D |
| 60 | It's our duty to obey all laws. | A | NS | D |
| 61 | It's OK to hit someone if you are really angry. | A | NS | D |
| 62 | It's not right to yell at your father. | A | NS | D |
| 63 | A lot of teachers bother young people too much. | A | NS | D |
| 64 | If I swore at my parents, I would feel bad afterwards. | A | NS | D |
| 65 | | A | NS | D |

| BELIEFS AND ATTITUDES SCALE | | | | |
|---|---|---|---|---|
| | INSTRUCTIONS:<br>Listed below are statements about people's beliefs and attitudes. Please circle whether you ***AGREE*** **(A)** are ***NOT SURE*** **(NS)** or ***DISAGREE*** **(D)** with each statement. | **Agree** | **Not Sure** | **Disagree** |
| | Fighting is wrong, even when somebody is really bothering you. | | | |
| 66 | Stealing from my parents isn't so bad when I need money. | A | NS | D |
| 67 | It's OK to swear at the teacher when you're really feeling mad. | A | NS | D |
| 68 | The law only helps rich and powerful people. | A | NS | D |
| 69 | Parents should know when their teenagers hang around with "bad" friends. | A | NS | D |
| 70 | We should respect almost all laws. | A | NS | D |

**ICU:**

**ICU**
**(Youth Version)**

*Instructions:Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number (0-3) for each statement. Do not leave any statement unrated.*

| | Not at | Somewhat true | Very true | Definitely True |
|---|---|---|---|---|
| 1. I express my feelings openly. | 0 | 1 | 2 | 3 |
| 2. What I think is "right" and "wrong" is different from what other people think. | 0 | 1 | 2 | 3 |
| 3. I care about how well I do at school or work. | 0 | 1 | 2 | 3 |
| 4. I do not care who I hurt to get what I want. | 0 | 1 | 2 | 3 |

| | | | | |
|---|---|---|---|---|
| 5. I feel bad or guilty when I do something wrong. | 0 | 1 | 2 | 3 |
| 6. I do not show my emotions to others. | 0 | 1 | 2 | 3 |
| 7. I do not care about being on time. | 0 | 1 | 2 | 3 |
| 8. I am concerned about the feelings of others. | 0 | 1 | 2 | 3 |
| 9. I do not care if I get into trouble. | 0 | 1 | 2 | 3 |
| 10. I do not let my feelings control me. | 0 | 1 | 2 | 3 |
| 11. I do not care about doing things well. | 0 | 1 | 2 | 3 |
| 12. I seem very cold and uncaring to others. | 0 | 1 | 2 | 3 |
| 13. I easily admit to being wrong. | 0 | 1 | 2 | 3 |
| 14. It is easy for others to tell how I am feeling. | 0 | 1 | 2 | 3 |
| 15. I always try my best. | 0 | 1 | 2 | 3 |
| 16. I apologize (“say I am sorry”) to persons I hurt. | 0 | 1 | 2 | 3 |
| 17. I try not to hurt others’ feelings. | 0 | 1 | 2 | 3 |
| 18. I do not feel remorseful when I do something wrong. | 0 | 1 | 2 | 3 |
| 19. I am very expressive and emotional. | 0 | 1 | 2 | 3 |
| 20. I do not like to put the time into doing things well. | 0 | 1 | 2 | 3 |
| 21. The feelings of others are unimportant to me. | 0 | 1 | 2 | 3 |
| 22. I hide my feelings from others. | 0 | 1 | 2 | 3 |
| 23. I work hard on everything I do. | 0 | 1 | 2 | 3 |
| 24. I do things to make others feel good. | 0 | 1 | 2 | 3 |

Unpublished rating scale by Paul J. Frick, Department of Psychology, University of New Orleans (pfrick@uno.edu) .

SDQ:

## Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of how things have been for you over the last six months.

Your Name ..... Male/Female

Date of Birth.....

| | Not True | Somewhat True | Certainly True |
|---|---|---|---|
| I try to be nice to other people. I care about their feelings | ☐ | ☐ | ☐ |
| I am restless, I cannot stay still for long | ☐ | ☐ | ☐ |
| I get a lot of headaches, stomach-aches or sickness | ☐ | ☐ | ☐ |
| I usually share with others (food, games, pens etc.) | ☐ | ☐ | ☐ |
| I get very angry and often lose my temper | ☐ | ☐ | ☐ |
| I am usually on my own. I generally play alone or keep to myself | ☐ | ☐ | ☐ |
| I usually do as I am told | ☐ | ☐ | ☐ |
| I worry a lot | ☐ | ☐ | ☐ |
| I am helpful if someone is hurt, upset or feeling ill | ☐ | ☐ | ☐ |
| I am constantly fidgeting or squirming | ☐ | ☐ | ☐ |
| I have one good friend or more | ☐ | ☐ | ☐ |
| I fight a lot. I can make other people do what I want | ☐ | ☐ | ☐ |
| I am often unhappy, down-hearted or tearful | ☐ | ☐ | ☐ |
| Other people my age generally like me | ☐ | ☐ | ☐ |
| I am easily distracted, I find it difficult to concentrate | ☐ | ☐ | ☐ |
| I am nervous in new situations. I easily lose confidence | ☐ | ☐ | ☐ |
| I am kind to younger children | ☐ | ☐ | ☐ |
| I am often accused of lying or cheating | ☐ | ☐ | ☐ |
| Other children or young people pick on me or bully me | ☐ | ☐ | ☐ |
| I often volunteer to help others (parents, teachers, children) | ☐ | ☐ | ☐ |
| I think before I do things | ☐ | ☐ | ☐ |
| I take things that are not mine from home, school or elsewhere | ☐ | ☐ | ☐ |
| I get on better with adults than with people my own age | ☐ | ☐ | ☐ |
| I have many fears, I am easily scared | ☐ | ☐ | ☐ |
| I finish the work I'm doing. My attention is good | ☐ | ☐ | ☐ |

**SRD:**

## Your 6 months

These questions are about things that have happened and things that you may have done in the last **6 months**. You are reminded that all your responses are strictly confidential

1. **During the last 6 months at school how often did these things happen to you because of something you had done wrong…?** (tick ONE box in EVERY line)

| | | Never | 1 or 2 times | 3 or 4 times | 5 or more times |
|---|---|---|---|---|---|
| a. | My parents had to sign a punishment exercise… | ☐ | ☐ | ☐ | ☐ |
| b. | The school got in touch with my parents by letter or telephone…… | ☐ | ☐ | ☐ | ☐ |
| c. | I was given detention…… | ☐ | ☐ | ☐ | ☐ |
| d. | I was sent to the head of department or the head teacher……. | ☐ | ☐ | ☐ | ☐ |
| e. | I was put on a conduct/behaviour sheet…… | ☐ | ☐ | ☐ | ☐ |
| f. | I was given extra homework to do…….. | ☐ | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

**2. <u>During the last 6 months</u> how often did you do these things at school…?** (tick ONE box on EVERY line)

| | | Most days | At least once a week | Less than once a week | Hardly ever or never |
|---|---|---|---|---|---|
| a. | Arrive late for classes…….. | ☐ | ☐ | ☐ | ☐ |
| b. | Fight in or outside the class……... | ☐ | ☐ | ☐ | ☐ |
| c. | Refuse to do homework or class work……. | ☐ | ☐ | ☐ | ☐ |
| d. | Be cheeky to a teacher……... | ☐ | ☐ | ☐ | ☐ |
| e. | Use bad or offensive language…….. | ☐ | ☐ | ☐ | ☐ |
| f. | Wander around school during class time……. | ☐ | ☐ | ☐ | ☐ |
| g. | Threaten a teacher…….. | ☐ | ☐ | ☐ | ☐ |
| h. | Hit or kick a teacher……. | ☐ | ☐ | ☐ | ☐ |
| i. | Cheat doing homework or tests……..…….. | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| j. | Purposely damage or destroy things belonging to the school……. | ☐ | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

**3. <u>During the last 6 months</u>, how often did you do each of these things…?**
(tick ONE box on EVERY line)

| | | Most days | At least once a week | Less than once a week | Never |
|---|---|---|---|---|---|
| a. | Yelled or screamed at your mother to her face….. | ☐ | ☐ | ☐ | ☐ |
| b. | Hit or slapped your mother…… | ☐ | ☐ | ☐ | ☐ |
| c. | Yelled or screamed at your father to his face…..... | ☐ | ☐ | ☐ | ☐ |
| d. | Hit or slapped your father…….. | ☐ | ☐ | ☐ | ☐ |
| e. | Returned home later than when your parents told you to be in by…..……...… | ☐ | ☐ | ☐ | ☐ |
| f. | Stayed overnight elsewhere when told by your parents to return home …… | ☐ | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

**4. <u>During the last 6 months</u> at school, did you skip or skive school?**

☐ Yes – **answer questions in box below** ☐ No – **go to next question**

↓

**a. How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**b. What is the longest single period you skived for in the last 6 months?**

☐ Part of a day ☐ 1 or 2 days ☐ 3 to 5 days ☐ More than one week

**5. <u>During the last 6 months</u>, have you run away from home for at least one night without your parents knowing where you were?**

☐ Yes – **answer questions in box below** ☐ No – **go to next question**

↓

**a. How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**b. What is the longest single period you have run away from home for?**

☐ 1 or 2 days ☐ Up to 1 week ☐ Up to 2 weeks ☐ More than 2 weeks

**6. <u>During the last 6 months</u>, how often did you do each of these things to someone you know?** (DON'T include brothers or sisters) (tick ONE box on EVERY line)

| | Never | Less than once a week | At least once a week | Most days |
|---|---|---|---|---|
| a. Ignore them on purpose or leave them out of things…… | ☐ | ☐ | ☐ | ☐ |
| b. Say nasty things, slag them or call them names…… | ☐ | ☐ | ☐ | ☐ |
| c. Threaten or hurt them……. | ☐ | ☐ | ☐ | ☐ |
| d. Hit, spit or throw stones at them……... | ☐ | ☐ | ☐ | ☐ |
| e. Get other people to do these things……. | ☐ | ☐ | ☐ | ☐ |
| *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

**7. <u>During the last 6 months</u>, did you travel on a bus or train without paying enough money or using some else's pass?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

8. **<u>During the last 6 months</u>, did you write or spray paint on property that did not belong to you (e.g. a phone box, car, building or bus shelter)?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

9. **<u>During the last 6 months</u>, did you steal money or something else from <u>home</u>?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

10. **<u>During the last 6 months</u>, did you sign someone else's name to get money or other things you wanted?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

11. **<u>During the last 6 months</u>, did you use force, threats or a weapon to steal money or something else from somebody?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**12. <u>During the last 6 months</u>, did you steal something from a shop or store?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**13. <u>During the last 6 months</u>, did you break into a car or van to try and steal something out of it?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

14. **<u>During the last 6 months</u>, were you noisy or cheeky in a public place so that people complained or you got into trouble?** (DON'T include things you did at school)

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

15. **<u>During the last 6 months</u>, did you ride in a stolen car or van or on a stolen motorbike?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

16. **<u>During the last 6 months</u>, did you steal money or something else from school?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**17. <u>During the last 6 months</u>, did you break into a house or building to steal something?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**18. <u>During the last 6 months</u>, did you damage or destroy property that did not belong to you on purpose (e.g. windows, cars or street lights)?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**19. <u>During the last 6 months</u>, did you set fire or try to set fire to something on purpose (e.g. a school, bus shelter, house etc)?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**20. <u>During the last 6 months</u>, did you carry a knife or other weapon with you for protection or in case it was needed in a fight?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**21. <u>During the last 6 months</u>, did you hurt or injure any animals or birds on purpose?**

(DON'T include insects)

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**22. <u>During the last 6 months</u>, did you hit or pick on someone because of their race or skin colour?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**23. <u>During the last 6 months</u>, did you hit, kick or punch a brother or sister on purpose?** (DON'T include play fighting)

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**24. <u>During the last 6 months</u>, have you had (or tried to have) sexual relations with somebody against their will?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐More than 10 times

**25. <u>During the last 6 months</u>, did you hit, kick or punch someone else on purpose (fight with them)?** (DON'T include brothers, sisters or play fighting)

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**26 <u>During the last 6 months</u>, did you sell an illegal drug to someone?**

.

☐ Yes – **answer questions in box below** ☐ No – **go to next question**

↓

**a. How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**b. What kind of drugs did you sell in the last 6 months?** (please write in)

_____

_____

**27. <u>During the last 6 months</u> did you smoke a cigarette?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How often do you smoke now?** (tick ONE box only)

☐ Hardly ever or never ☐ At least once a month

☐ At least once a week ☐ Every day

**28. <u>During the last 6 months did you drink an alcoholic drink</u>?**

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How often do you drink alcohol now?** (tick ONE box only)

☐ Hardly ever or never ☐ Only on special occasions

☐ At least once a month ☐ At least once a week

**29. <u>During the last 6 months</u>, did you take or try any illegal drugs (that includes sniffing gas or glue)?**

☐ Yes – **answer questions in box below** ☐ No – **go to next question**

↓

**How often have you tried each of these drugs <u>during the last 6 months</u>?**

(tick ONE box on each line)

| | | Never | Once | 2 or 3 times | 4 times or more |
|---|---|---|---|---|---|
| a. | Cannabis (dope, hash, marijuana)……. | ☐ | ☐ | ☐ | ☐ |
| b. | Glue or gas (tippex, lighter fuel, aerosols)…… | ☐ | ☐ | ☐ | ☐ |
| c. | Ecstasy (E, pills) …….. | ☐ | ☐ | ☐ | ☐ |
| d. | Semeron (Sems) …….. | ☐ | ☐ | ☐ | ☐ |
| e. | Cocaine (Coke, charlie, C, crack) …….. | ☐ | ☐ | ☐ | ☐ |
| f. | Speed (whizz, amphetamines) …….. | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| g. | Heroin (smack, horse, brown, skag) …… | ☐ | ☐ | ☐ | ☐ |
| h. | LSD (acid, trips, tabs) …….. | ☐ | ☐ | ☐ | ☐ |
| i. | Magic Mushrooms (mushies) ……. | ☐ | ☐ | ☐ | ☐ |
| j. | Downers (temazepam, jellies, valium, eggs) …… | ☐ | ☐ | ☐ | ☐ |
| k. | Poppers (amyl nitrate) ……. | ☐ | ☐ | ☐ | ☐ |
| l. | Something else ……. | ☐ | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

If something else, please say what

_____

m. **How often have you used any illegal drug <u>during the last month</u>?**

(tick ONE box only)

☐ Never ☐ Once ☐ 2 or 3 times ☐ 4 times or more

# <u>Your Friends</u>

**Some questions about what <u>your friends did</u> during the last <u>6 months</u>.**

1. **How many of your friends smoked cigarettes <u>during the last 6 months</u>?**

(tick ONE box only)

☐ None ☐ One or some ☐ Most or all ☐ I'm not sure

2.. **How many of your friends drank alcohol <u>during the last 6 months</u>?**

(tick ONE box only)

☐ None ☐ One or some ☐ Most or all ☐ I'm not sure

3. **How many of your friends took illegal drugs <u>during the last 6 months</u>?**

(tick ONE box only)

☐ None ☐ One or some ☐ Most or all ☐ I'm not sure

4. **<u>During the last 6 months</u>, did any of your friends do any of these things to other people?** (tick ONE box on EVERY line)

| | Yes | No | Not sure |
|---|---|---|---|
| a. | | | |

| | | | | |
|---|---|---|---|---|
| | A friend was noisy or cheeky in a public place so that people complained or they got into trouble… | ☐ | ☐ | ☐ |
| b. | A friend hit, kicked or punched someone on purpose (had a fight with someone)…….. | ☐ | ☐ | ☐ |
| c. | A friend used force, threats or a weapon to get money or something else from someone…….. | ☐ | ☐ | ☐ |
| d. | A friend hit or picked on someone because of their race or skin colour…… | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* |

**5. <u>During the last 6 months</u>, did any of your friends take something that didn't belong to them in any of these ways?** (tick ONE box on EVERY line)

| | | Yes | No | Not sure |
|---|---|---|---|---|
| a. | A friend stole something from a shop or store….. | ☐ | ☐ | ☐ |
| b. | A friend stole money or something else from school…….. | ☐ | ☐ | ☐ |
| c. | A friend stole money or something else from home…… | ☐ | ☐ | ☐ |
| d. | A friend broke into a house or building to steal something…… | ☐ | ☐ | ☐ |
| e. | A friend broke into a car or van to steal something…… | | | |

| | | | |
|---|---|---|---|
| | ☐ | ☐ | ☐ |
| *Office use only, code:* | *[0]* | *[1]* | *[2]* |

**6. <u>During the last 6 months</u>, did any of your friends do these things to other people's property?** (tick ONE box in EVERY line)

| | | Yes | No | Not sure |
|---|---|---|---|---|
| a. | A friend wrote or sprayed paint on someone's property…….. | ☐ | ☐ | ☐ |
| b. | A friend damaged someone's property on purpose…… | ☐ | ☐ | ☐ |
| c. | A friend set fire or tried to set fire to something on purpose…….. | ☐ | ☐ | ☐ |
| d. | A friend rode in a stolen car, van or motorbike…. | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* |

**7. <u>During the last 6 months</u>, did any of your friends do any of these things?**

(tick ONE box in EVERY line)

| | | Yes | No | Not sure |
|---|---|---|---|---|
| a. | A friend skipped or skived school…… | ☐ | ☐ | ☐ |
| b. | A friend traveled on a bus or train without paying enough money or using someone else's pass…. | ☐ | ☐ | ☐ |
| c. | A friend carried a knife or other weapon for protection or in case it was needed in a fight…… | | | |

| | | | | |
|---|---|---|---|---|
| | | ☐ | ☐ | ☐ |
| d. | A friend hurt or injured an animal or bird on purpose…… | ☐ | ☐ | ☐ |
| e. | A friend sold an illegal drug to someone…… | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* |

## Things That Happen

**Things that might have happened to you during the last 6 months.**

**1. <u>During the last 6 months</u>, how often were <u>you bullied</u> in the following ways?**

(tick ONE box in EVERY line)

| | | Most days | At least once a week | Less than once a week | Never |
|---|---|---|---|---|---|
| a. | Bullied by somebody ignoring you on purpose or leaving you out of things…… | ☐ | ☐ | ☐ | ☐ |
| b. | Bullied by somebody saying nasty things, slagging you or calling you names…… | ☐ | ☐ | ☐ | ☐ |
| c. | Bullied by somebody threatening to hurt you….. | ☐ | ☐ | ☐ | ☐ |
| d. | Bullied by somebody hitting, kicking, punching or throwing stones at you……... | ☐ | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

**2. During the last 6 months, did anyone hurt you by hitting, kicking or punching you?**

(DON'T include brothers, sisters or times you were being bullied)

☐ Yes – **answer question in box below** ☐ No – **go to next question**

↓

**How many times did you do this in the last 6 months?** (tick ONE box only)

☐ Once ☐ Twice ☐ 3 times ☐ 4 times ☐ 5 times

☐ Between 6 and 10 times ☐ More than 10 times

**3. During the last 6 months, how many times have you been bothered by an adult doing the following things?** (tick ONE box in EVERY line)

| | | Never | 1 or 2 times | 3 or 4 times | 5 or more times |
|---|---|---|---|---|---|
| a. | An adult staring at you so that you felt uneasy or uncomforTable…… | ☐ | ☐ | ☐ | ☐ |
| b. | An adult following you on foot…….. | ☐ | ☐ | ☐ | ☐ |
| c. | An adult following you by car……... | ☐ | ☐ | ☐ | ☐ |
| d. | An adult trying to get you to go somewhere with them……. | ☐ | ☐ | ☐ | ☐ |
| e. | An adult indecently exposing themselves to you (flashing)……. | ☐ | ☐ | ☐ | ☐ |
| f. | An adult touching you in a way that makes you feel uncomfortable……. | ☐ | ☐ | ☐ | ☐ |
| | *Office use only, code:* | *[0]* | *[1]* | *[2]* | *[3]* |

## Appendix E: Example of Mplus Syntax for Bifactor Analysis

```
TITLE: Bi factor APQ
DATA: FILE IS C:/Users/stevi/Desktop/Thesis statistics/123.dat;
VARIABLE:
NAMES IS
ID  PNO Age
Sex Group Ethnic Site1 Site2
SES FSIQ Onset TOFYRPR VOFYPR
APQ1 APQ2 APQ3 APQ4 APQ5 APQ6 APQ7
APQ8 APQ9 APQ10 APQ11 APQ12 APQ13
APQ14 APQ15
ABAS1 ABAS2 ABAS3 ABAS4 ABAS5 ABAS6
ABAS7 ABAS8 ABAS9 ABAS10 ABAS11 ABAS12
ABAS13 ABAS14 ABAS15 ABAS16 ABAS17 ABAS18
ABAS19 ABAS20 ABAS21 ABAS22 ABAS23 ABAS24
ABAS25 ABAS26 ABAS27 ABAS28 ABAS29 ABAS30
ABAS31 ABAS32 ABAS33 ABAS34 ABAS35 ABAS36
ABAS37 ABAS38 ABAS39 ABAS40 ABAS41 ABAS42
ABAS43 ABAS44 ABAS45 ABAS46 ABAS47 ABAS48
ABAS49 ABAS50 ABAS51 ABAS52 ABAS53 ABAS54
ABAS55 ABAS56 ABAS57 ABAS58 ABAS59 ABAS60
ABAS61 ABAS62 ABAS63 ABAS64 ABAS65 ABAS66
ABAS67 ABAS68 ABAS69 ABAS70
SoDeS1 SoDeS2 SoDeS3 SoDeS4 SoDeS5 SoDeS6
SoDeS7 SoDeS8 SoDeS9
CONP1 CONP2 CONP3 CONP4 CONP5 CONP6 CONP7
CONP8 CONP9 CONP10 CONP11 CONP12 CONP13
CONP14 CONP15 CONP16 CONP17 CONP18 CONP19
CONP20 CONP21 CONP22 CONP23 CONP24
ICUP1 ICUP2 ICUP3 ICUP4 ICUP5 ICUP6 ICUP7
ICUP8 ICUP9 ICUP10 ICUP11 ICUP12 ICUP13
ICUP14 ICUP15 ICUP16 ICUP17 ICUP18 ICUP19
ICUP20 ICUP21 ICUP22 ICUP23 ICUP24
SDQC1 SDQC2 SDQC3 SDQC4 SDQC5 SDQC6
SDQC7 SDQC8 SDQC9 SDQC10 SDQC11 SDQC12
SDQC13 SDQC14 SDQC15 SDQC16 SDQC17 SDQC18
```

```
 SDQC19 SDQC20 SDQC21 SDQC22 SDQC23 SDQC24
 SDQC25
 SRD1 SRD2 SRD3 SRD4 SRD5 SRD6 SRD7 SRD8 SRD9
 SRD10 SRD11 SRD12 SRD13 SRD14 SRD15 SRD16 SRD17
 SRD18 SRD19 SRD20 SRD21 SRD22 SRD23 SRD24 SRD25
 SRD26 SRD27 SRD28 SRD29 SRD30 SRD31 SRD32 SRD33
 SRD34 SRD35 SRD36 SRD37 SRD38 SRD39 SRD40 SRD41
 SRD42 SRD43 SRD44 SRD45 SRD46 SRD47 SRD48 SRD49
 SRD50 SRD51 SRD52 SRD53 SRD54 SRD55 SRD56 SRD57
 SRD58 SRD59 SRD60 SRD61 SRD62 SRD63 SRD64 SRD65
 SRD66 SDR67 SRD68 SDR69 SRD70 SDR71 SRD72 SDR73
 SRD74 SRD75 SDR76 SRD77 SDR78 SRD79i SDR79ii SRD80i
 SDR80ii SRD81i SDR81ii SRD82i SDR82ii  SRD83i SDR83ii
 SRD84i SDR84ii SRD85i SDR85ii SRD86i SDR86ii SRD87i
 SDR87ii SRD88i SDR88ii SRD89ii SDR89i SRD90i SDR90ii
 SRD92 SDR93 SRDF1 SRDF2 SRDF3 SRDF4  SRDF5 SRDF6 SRDF7
 SRDF8 SRDF9 SRDF10 SRDF11 SRDF12 SRDF13 SRDF14 SRDF15
SRDF16 SRDF17 SRDF18 SRDF19 SRDF20 SRDF21 SRDMe1 SRDMe2
 SRDMe3 SRDMe4 SRDMe5 SRDMe6 SRDMe7 SRDMe8 SRDMe9
 SRDMe10 SRDMe11 SRDMe12;
 MISSING = ALL (-999);
 USEV IS
 APQ1 APQ2 APQ3 APQ4   APQ5 APQ6  APQ7 APQ8 APQ9  APQ10 APQ11  APQ12
APQ13     APQ14    APQ15;
 CATEGORICAL IS
 APQ1 APQ2 APQ3 APQ4   APQ5 APQ6  APQ7 APQ8 APQ9  APQ10 APQ11  APQ12
 APQ13     APQ14    APQ15;
  MODEL:
P by
 APQ2* APQ3 APQ4   APQ5 APQ6    APQ7 APQ8 APQ9  APQ10 APQ11  APQ12
 APQ13     APQ14    APQ15;
 P@1
 F1 BY
 APQ13* ! HIT YOU
 APQ14 ! SLAP YOU
 APQ15; ! BEAT WITH BELTS
 F1@1;
```

```
      F2 BY
      APQ2* ! THREATEN TO PUNISH
      APQ5 ! TALK OUT OF PUNISHMENT
      APQ12; ! LET OUT PUNISHMENT
      F2@1;
      F3 BY
      APQ3* ! OUT WITHOUT NOTE
      APQ7 ! STAY OUT PAST CURFEW
      APQ11; ! DONT KNKOW FRIENDS
      F3@1;
      P with F1@0 F2@0; f3@0;
      F1 WITH F2@0 F3@0;
      F2 WITH F3@0;
      ANALYSIS: ESTIMATOR = WLSMV;
      PROCESSOR =4;
   PLOT: TYPE = PLOT1 PLOT2 PLOT3;
OUTPUT: TECH1 TECH4 STANDARDIZED RESIDUAL MODINDICES SAMPSTAT;
SAVEDATA: FILE IS 3FACTORBIFACTORAPQWLSMVR.DAT;
        SAVE IS FSCORES;
        FORMAT IS FREE;
```

## Appendix F: Table summarising factor loadings on the Alabama Parenting Questionnaire

**Summary Table of Factor Loadings of the Alabama Parenting Questionnaire**

| APQ-15 | Factor | | | | |
|---|---|---|---|---|---|
| **Item** | **General** | **Corporal Punishment** | **Inconsistent** | **Monitoring** | **Positive** |
| 13. Your parents spank you with their hand when you have done something wrong | .063* | .907*** | | | |
| 14. Your parents slap you when you have done something wrong | .174** | .928*** | | | |
| 15. Your parents hit you with a belt, or other object when you have done something wrong | .263*** | .759*** | | | |
| 2. Your parents threaten to punish you and then do not do it | .092* | | .561*** | | |
| 5. You talk your parents out of punishing you after you have done something wrong | -.178*** | | .480*** | | |
| 12. Your parents let you out of a punishment early (like lift restrictions earlier than they originally said) | -.140* | | .725*** | | |
| 3. You go out without leaving a note or letting your parents know where you are going | .161*** | | | .549*** | |
| 7. You stay out in the evening past the time you are supposed to be home | -.013** | | | .737*** | |
| 11. Your parents do not know who you are friends with | .158* | | | .289*** | |
| 4. You play games with or do other fun things with your mum | .673*** | | | | .308*** |
| 8. Your mum helps with your homework | .664*** | | | | .218*** |
| 9. Your parents compliment you when you have done something well | .882*** | | | | 264*** |
| 10. Your parents praise you for behaving well | .845*** | | | | .357*** |

***p < .001; **p < .01; *p < .05.

## Appendix G: Table summarising factor loadings on the Antisocial Beliefs and Attitudes Scale

**Summary table of Factor Loadings of Antisocial Beliefs and Attitudes Scale**

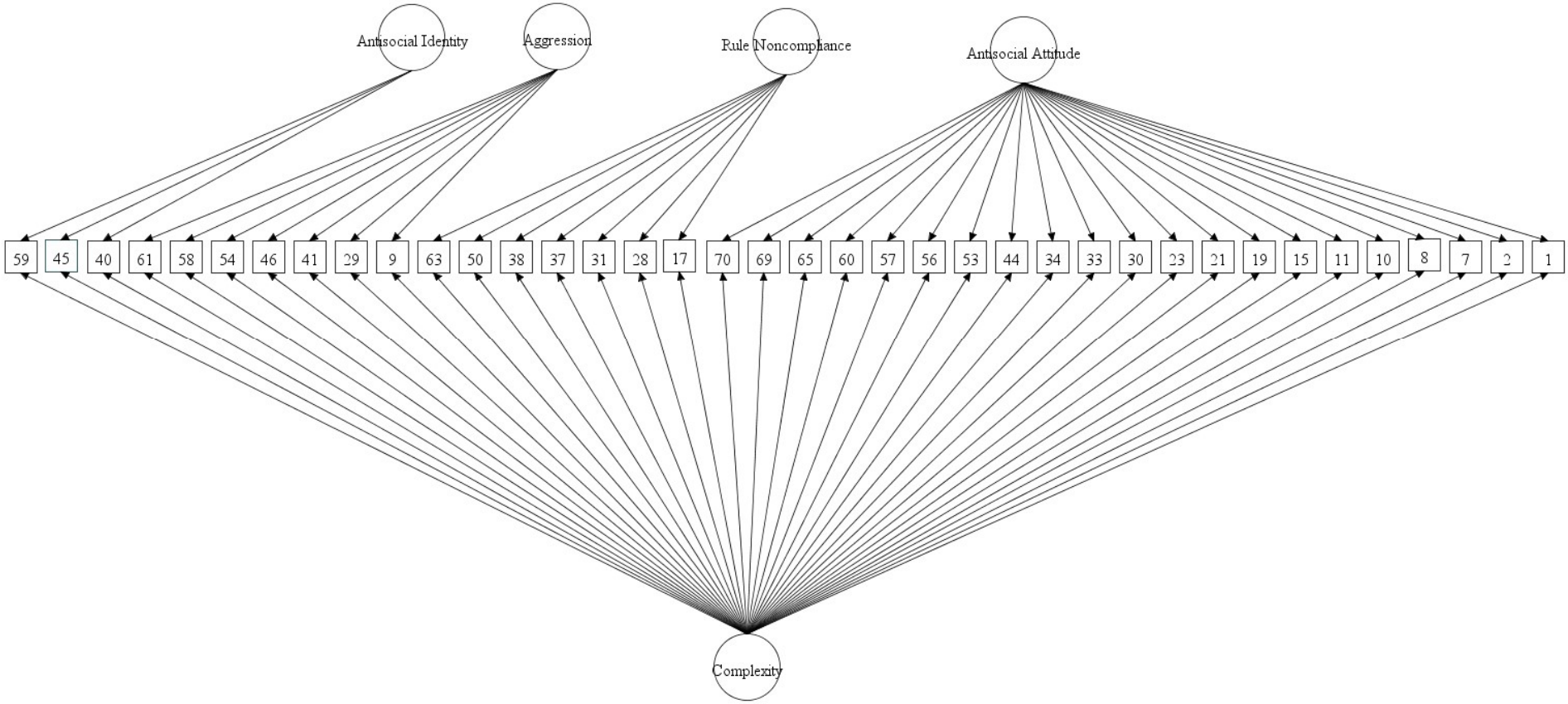
| ABAS | Factor | | | | |
|---|---|---|---|---|---|
| Item | General | Antisocial Attitude | Rule Noncompliance | Aggression | Antisocial Identity |
| 1. Judges are [not] honest and kind | .451*** | .437*** | | | |
| 2. The law is [not] good | .558*** | .455*** | | | |
| 7. I'd feel pretty bad if I broke the rules at my school | .614*** | .304*** | | | |
| 8. Teenagers have to lie so they don't get into trouble | .519*** | -.258*** | | | |
| 10. We'd [not] be better off if there were more police | .431*** | .392*** | | | |
| 11. I think people are always trying to get me into trouble | .388*** | -.279*** | | | |
| 15. Court decisions are always fair | .416*** | .487*** | | | |
| 19. The police are [not] honest | .548*** | .520*** | | | |
| 21. I'm [not] afraid to hang around with young people who get into trouble | .469*** | .344*** | | | |
| 23. Curfews help teenagers stay out of trouble | .454*** | .386*** | | | |
| 30. Sometimes you have to use younger children to break the law | .556*** | -.262*** | | | |
| 33. Young people have to lie to get what they want | .646*** | -.212*** | | | |
| 34. Students should answer the teacher back | .496*** | .258*** | | | |
| 44. Lawyers are [not] honest | .341*** | .344*** | | | |

| | | | | | |
|---|---|---|---|---|---|
| 53. Teachers [don't]have the right to tell students what to do | .523*** | .372*** | | | |
| 56. The police should [not] be paid more for their work | .454*** | .496*** | | | |
| 57. You should [not] always obey the law, even if it stops you from getting what you want | .583*** | .462*** | | | |
| 60. It is [not] our duty to obey all laws | .509*** | .468*** | | | |
| 65. Fighting is wrong even when somebody is really bothering you | .582*** | .347*** | | | |
| 69. Parents should know when their teenagers hang out with "bad" friends | .439*** | .326*** | | | |
| 70. We should [not]respect almost all laws | .576*** | .578*** | | | |
| 17. I don't like to obey all the rules at school and home | .580*** | | .313*** | | |
| 28. You have to let other teenagers know they can't push you around | .472*** | | .404*** | | |
| 31. It's not right to take money from a younger child | .340*** | | -.313*** | | |
| 37. Young people have to steal to get nice things | .646*** | | -.269*** | | |
| 38. You're crazy to work for a living if there is an easier way, even if you do have to break the law | .691*** | | -.303*** | | |
| 50. Teenagers feel better when they know they can win a fight | .598*** | | .396*** | | |
| 63. A lot of teachers bother young people too much | .574*** | | .479*** | | |
| 9. Bullying my mother helps me get what I want | .526*** | | | | .422*** |
| 29. I [don't] respect teenagers who listen to their parents | .527*** | | | .174*** | |
| 41. It's Ok to swear at your mother when she treats you unfairly | .653*** | | | .314*** | |

| | | | |
|---|---|---|---|
| 46. If my mother tried to get me into big trouble, I'd threaten to hurt her | .534*** | .553*** | |
| 54. The police are as crooked as the people they arrest | .644*** | -.273*** | |
| 58. It's OK to push or shove your parents if you really lose your temper | .611*** | .639*** | |
| 61. It's OK to hit someone if you are really angry | .643*** | .316*** | |
| 40. Teenagers who get into trouble think like me | .594*** | | .591*** |
| 45. Young people who break the law think like me | .624*** | | .622*** |
| 59. I'm more like teenagers who break the law than people who don't break it | .671*** | | .244*** |

***p < .001; **p < .01; *p < .05.

## Appendix H: Bifactor model of the Antisocial Beliefs and Attitudes Scale



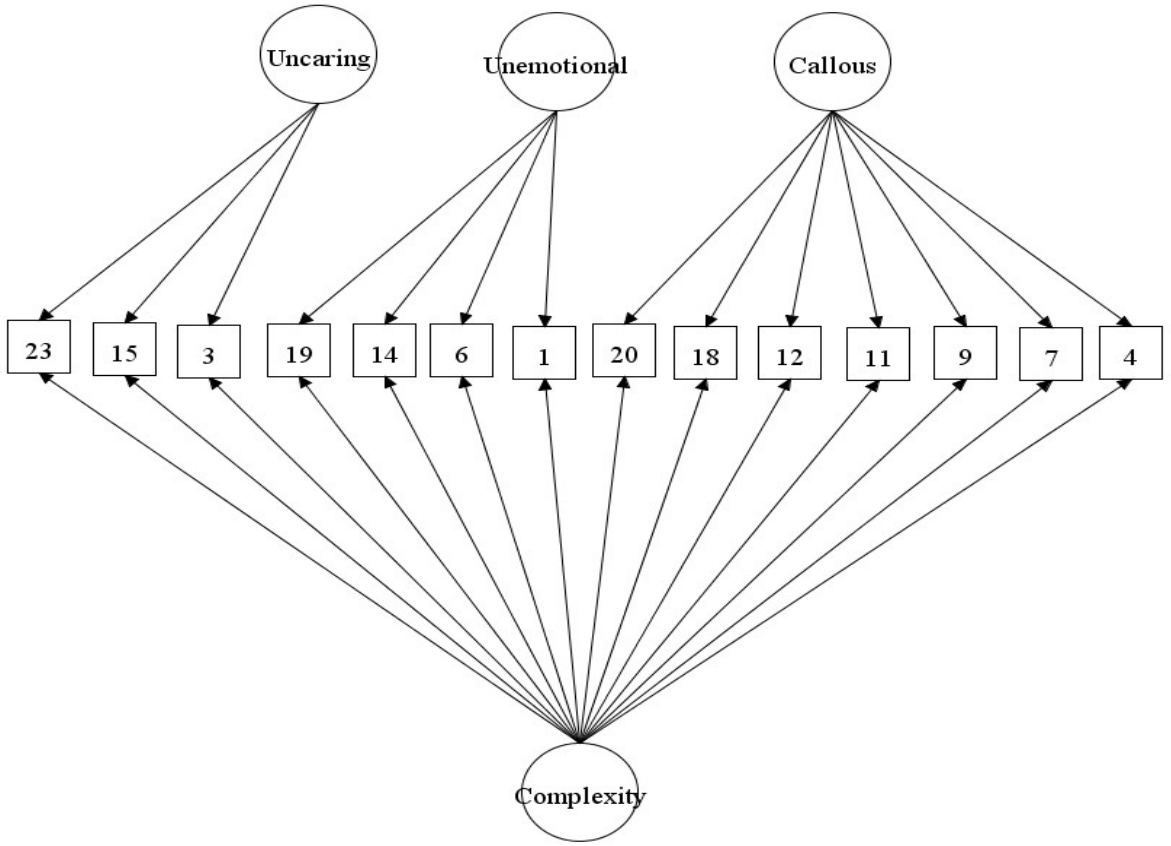
**Appendix I: Table summarising factor loadings on the Inventory of Callous and Unemotional Traits Questionnaire**

**Summary table of Factor Loadings of the Inventory of Callous Unemotional Traits**

| ICU | Factor | | | |
|---|---|---|---|---|
| **Item** | **General** | **Callous** | **Unemotional** | **Uncaring** |
| 4. I do not care who I hurt to get what I want | .332*** | .416*** | | |
| 7. I do not care about being on time | .228*** | .632*** | | |
| 9. I do not care if I get into trouble | .363*** | .645*** | | |
| 11. I do not care about doing well in things | .325*** | .584*** | | |
| 12. I seem very cold and uncaring to others | .236*** | .378*** | | |
| 18. I do not feel remorse when I do something wrong | .179*** | .395*** | | |
| 20. I do not like to put time into things | .065* | .517*** | | |
| 1. I do [not] express my feelings openly | .322*** | | .422*** | |
| 6. I do not show my emotions to others | .148*** | | .201*** | |
| 14. It is [not] easy for others to tell how I am feeling | .253*** | | .368*** | |
| 19. I am [not] very expressive and emotional | .359*** | | .731*** | |
| 3. I do [not] care how well I do at school or work | .419*** | | | .469*** |
| 15. I [do not] always try my best | .628*** | | | .511*** |
| 23. I [do not] work hard on everything I do | .463*** | | | .611*** |

***p < .001; **p < .01; *p < .05.

**Appendix J: Bifactor model of the Inventory of Callous and Unemotional Traits**



## Appendix K: Table summarising factor loadings on the Strengths and Difficulties Questionnaire

**Summary table of Factor Loadings of Strengths and Difficulties Questionnaire**

| SDQ | Factor | | | | |
|---|---|---|---|---|---|
| **Item** | **General** | **Hyperactivity** | **Prosocial** | **Mood** | **Antisocial** |
| 2. I am restless, I cannot sit still | -.556*** | .552*** | | | |
| 7. I usually do as I am told | -.532** | -.286*** | .473*** | | |
| 10. I am constantly fidgeting and squirming | .566*** | .567*** | | | |
| 15. I am easily distracted | .655*** | .382*** | | | |
| 1. I try to be nice to other people. I care about their feelings. | -.042* | | .708*** | | |
| 4. I usually share with others (foods, games, pens etc.) | -.130* | | .576*** | | |
| 9. I am helpful if someone is hurt, upset or feeling ill | .061* | | .727*** | | |
| 11. I [do not] have a good friend or more | -.234*** | | -.411*** | .345*** | |
| 14. Other people my age [do not] generally like me | -.101* | | -.407*** | .441*** | |
| 17. I am kind to younger children | .127* | | .641*** | | |
| 20. I often volunteer to help others | -.137** | | .518*** | | |
| 21. I [don't] think before doing things | .546*** | | -.261*** | | |
| 3. I get a lot of headaches, stomach-aches or sickness | -.245*** | | | .477*** | |
| 6. I am usually on my own. I generally play alone | -.152* | | | .409*** | |
| 8. I worry a lot | .326*** | | | .718*** | |
| 13. I am often unhappy, down-hearted or tearful | | | | .583*** | |

| | | | | |
|---|---|---|---|---|
| | .403*** | | | |
| 16. I am nervous in new situations | .261*** | | .410*** | |
| 19. Other children or young people pick on me or bully me | .104* | | .558*** | .364*** |
| 23. I get on better with adults than people my age | .102* | | .275*** | |
| 24. I have many fears, I am easily scared | .184*** | | .648*** | |
| 5. I get very angry and lose my temper | .652*** | | | .229*** |
| 12. I fight a lot, I can make other people do what I want | .441*** | | | .366*** |
| 18. I am often accused of lying or cheating | .457*** | | | .377*** |
| 25. I finish the work I'm doing; my attention is good | .463*** | | | -.457*** |

***p < .001; **p < .01; *p < .05.

## Appendix L: Table summarising factor loadings on the Self-Reported Delinquency Scale

**Summary table of Factor Loadings of the Self-Reported Delinquency Scale**

| SRD | Factor | | | | | | |
|---|---|---|---|---|---|---|---|
| Item | General | School | Peer Delinquency | Substance Misuse | Callousness | Offending | Bullied |
| 2. How often do school get in touch with my parents by letter or telephone in the last year | .448*** | .549*** | | | | | |
| 3. How often were you given detention in the last year | .359*** | .554*** | | | | | |
| 4. How often in the last year were you sent to the head of department or head teacher | .472*** | .604*** | | | | | |
| 5. How often in the last year were you put on a conduct/ behaviour sheet | .397*** | .626*** | | | | | |
| 6. How often in the last year were you given extra homework to do | .279*** | .346*** | | | | | |
| 7. How often in the last year did you arrive late for classes | .418*** | .540*** | | | | | |
| 8. How often in the last year were you in fights inside or outside of class | .348*** | .559*** | | | | | |
| 9. How often in the last year did you to do homework or class work | .435*** | .706*** | | | | | |
| 10.How often in the last year were you cheeky to a teacher | .434*** | .779*** | | | | | |
| 11. How often in the last year did you use bad or offensive language | .479*** | .683*** | | | | | |

| | | | |
|---|---|---|---|
| 12. How often in the last year did you wander around school during class time | .473*** | .718*** | |
| 13. How often in the last year did you threaten a teacher | .460*** | .667*** | |
| 14. How often in the last year did you hit or kicked a teacher | .392*** | .653*** | |
| 15. How often in the last year did you cheat during homework or a test | .369*** | .517*** | |
| 16. How often in the last year did you purposely damage or destroy things belonging to school | .482*** | .571*** | |
| 21. Returned home later than your parents told you to be in by | .529*** | | .241*** |
| 22. Stayed overnight elsewhere when told by your parents to return home | .518*** | | .356*** |
| 24. During the last year how many times did you skip or skive school | .532*** | | .765*** |
| 25. What is the longest single period you skived for | .389*** | | .884*** |
| 27. During the last year how many times did you run away from home | .532*** | | .472*** |
| 28. What is the longest single period you ran away from home | .548*** | | .417*** |
| 75. How often do you smoke | .646*** | | .330*** |
| 77. How often do you drink alcohol | .507*** | | .283*** |

| | | | | |
|---|---|---|---|---|
| F1. How many of your friends smoked cigarettes in the last year | .516*** | .450*** | | |
| F2. How many of your friend drank alcohol in the last year | .476*** | .428*** | | |
| 79. How often have you tried cannabis in the last year | .720*** | | .408*** | |
| 80. How often have you tried Solvents | .694*** | | .298*** | |
| 81. How often have you tried Ecstasy | .643*** | | .467*** | |
| 82. How often have you tried Semeron | .551*** | | .769*** | |
| 85. How often have you tried Heroin | .557*** | | .814*** | |
| 87. How often have you tried Magic Mushrooms | .342*** | | .468*** | |
| 29. How often have you ignored someone on purpose of left them out in the last year | .327*** | | | .620*** |
| 30. How often have you said nasty things, slagged them off or called them names in the last year | .398*** | | | .655*** |
| 31. How often have you threatened to hurt them in the last year | .439*** | | | .769*** |
| 32. How often have you hit, spat or thrown stone at them in the last year | .396*** | | | .767*** |

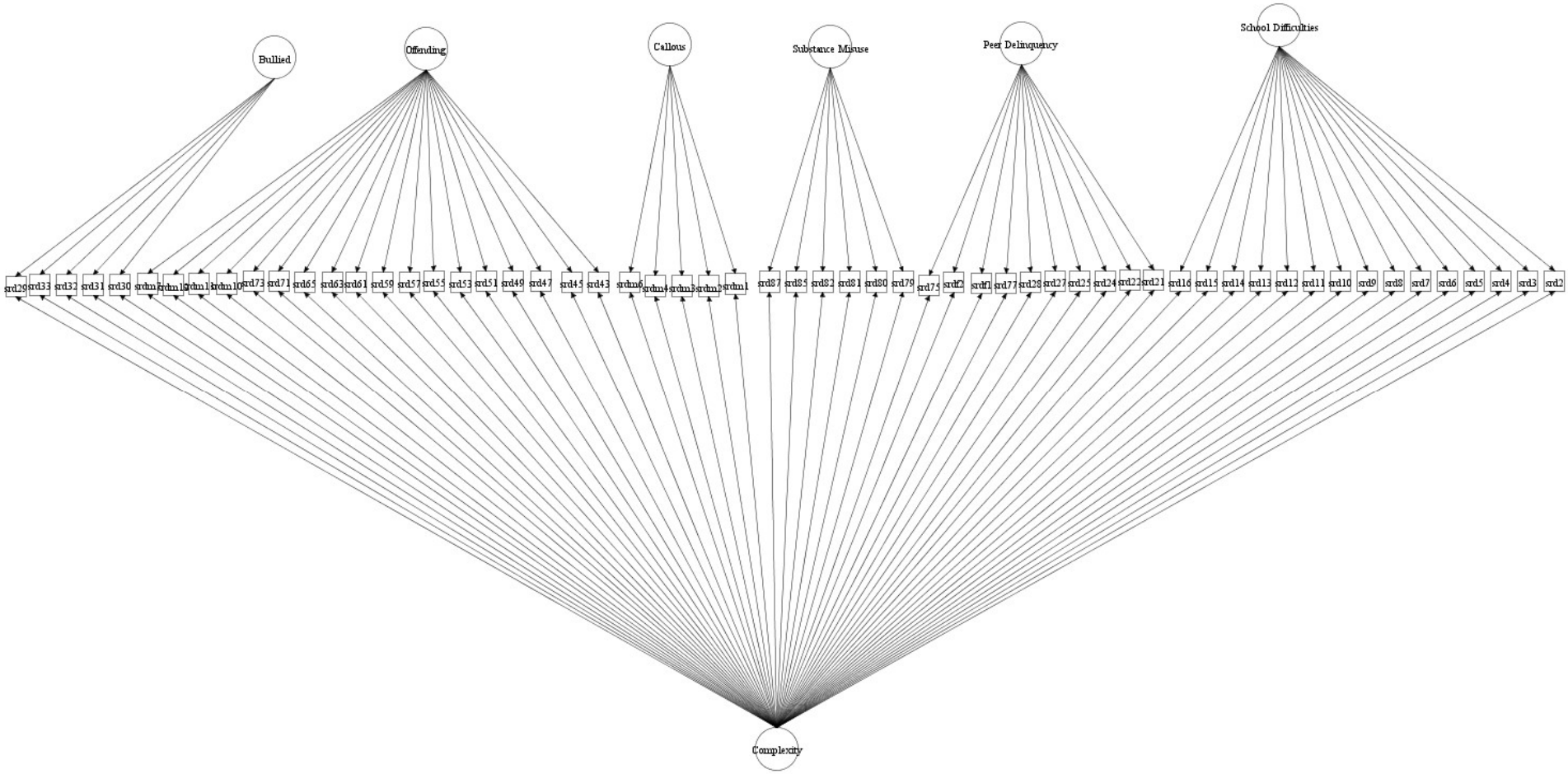
| | | | |
|---|---|---|---|
| 33. How often did you get other people to do these things in the last year | .361*** | .652*** | |
| 43. How many times did you use force, threat or weapon to steal money or something else from somebody in the last year | .746*** | | .327*** |
| 45. How many times did you seal from a shop or store in the last year | .645*** | | .275*** |
| 47. How many times did toy break into a car or van and steal something out in the last year | .762*** | | .432*** |
| 49. How many times were you noisy or cheeky in a public place so that people complained, or you got in trouble in the last year | .578*** | | .271*** |
| 51. How many times did you ride in a stolen car or van or on a stolen motorbike in the last year | .694*** | | .366*** |
| 53. How many times did you steal money or something else from school in the last year | .712*** | | .217*** |
| 55. How many times did you break into a house or building to steal something | .634*** | | .436*** |

| | | |
|---|---|---|
| 57. How many times did you damage or destroy property that did not belong to you on purpose in the last year | .557*** | .439*** |
| 59. How many times did you set fire or try to set fire to something on purpose in the last year | .640*** | .404*** |
| 61. How many times did you carry a knife or other weapon with you for your protection or in the case it was needed in a fight in the last year | .619*** | .375*** |
| 63. How many times did you hurt or injure any animal or birds on purpose in the last year | .573*** | .283*** |
| 65. How many times did you hit or pick on someone because of their race or skin colour in the last year | .613*** | .244*** |
| 71. How many times did you hit, kick or punch someone else on purpose in the last year | .525*** | .307*** |
| 73. How many times did you sell an illegal drug to someone in the last year | .745*** | .257*** |
| M10. An adult tried to get you to go somewhere with them | .722*** | -.542*** |
| M11. An adult indecently exposed themselves to you | .705*** | -.579*** |

| | | | | |
|---|---|---|---|---|
| M.12 An adult touched you in a way that makes you feel uncomfortable | .500*** | | -.406*** | |
| M1. Bullied by someone ignoring you on purpose or leaving you out of things | .230*** | | | .775*** |
| M2. Bullied by someone saying nasty things, slagging you off or calling you names | .233*** | | | .872*** |
| M3. Bullied by someone threatening to hurt you | .341*** | | | .771*** |
| M4. Bullied by somebody hitting, kicking, punching or throwing stones at you | .304*** | | | .769*** |
| M6. How many times has another person hurt you by kicking, hitting or punching in the last year | .222*** | | | .472*** |

***p < .001; **p < .01; *p < .05.

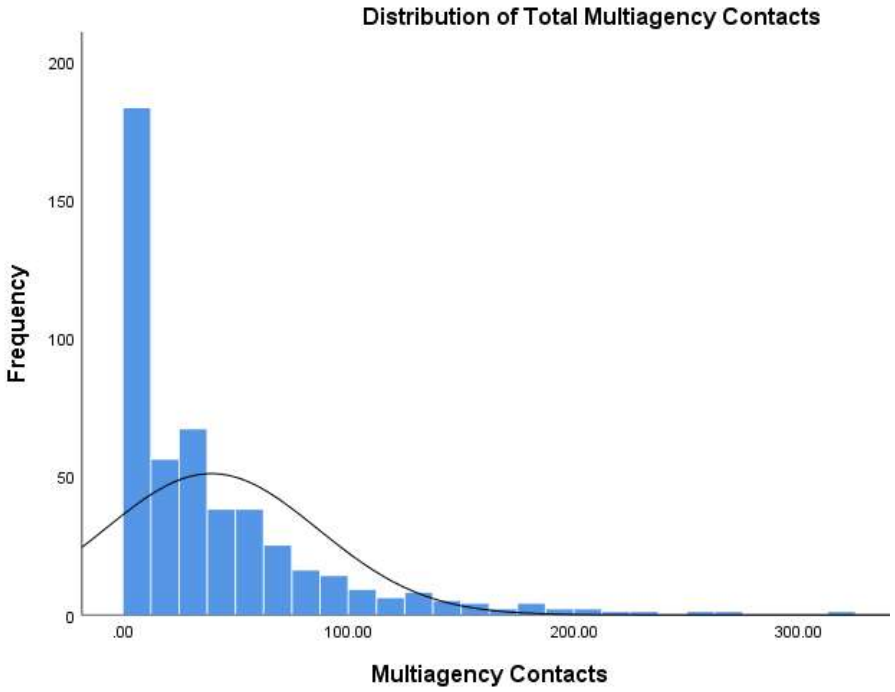
## Appendix M: Bifactor model of the Self-Reported Delinquency Scale

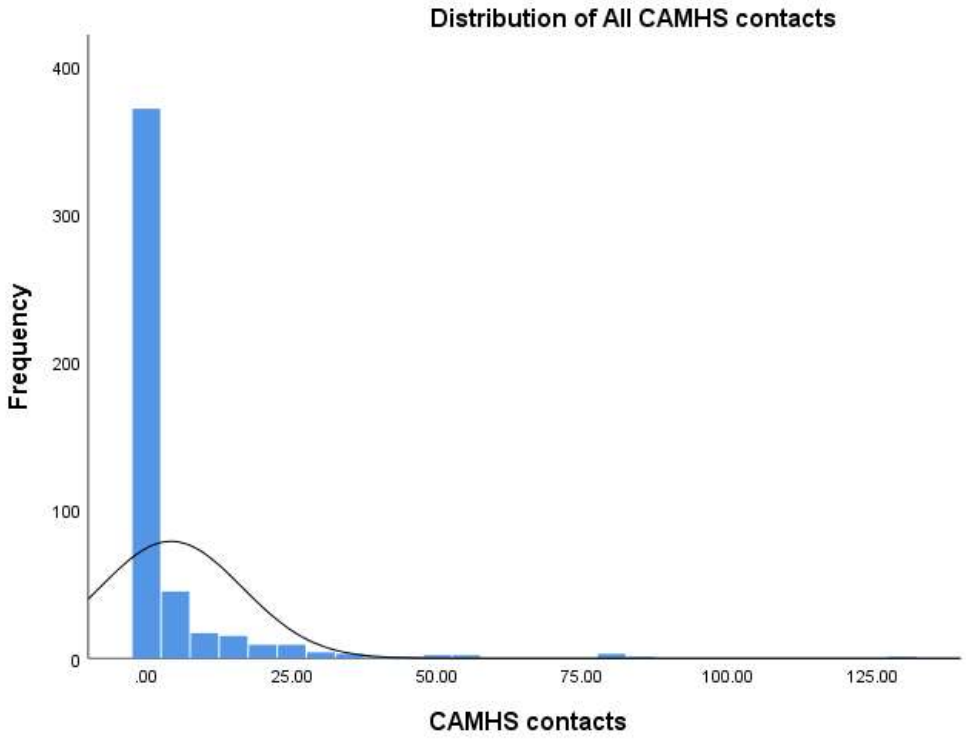


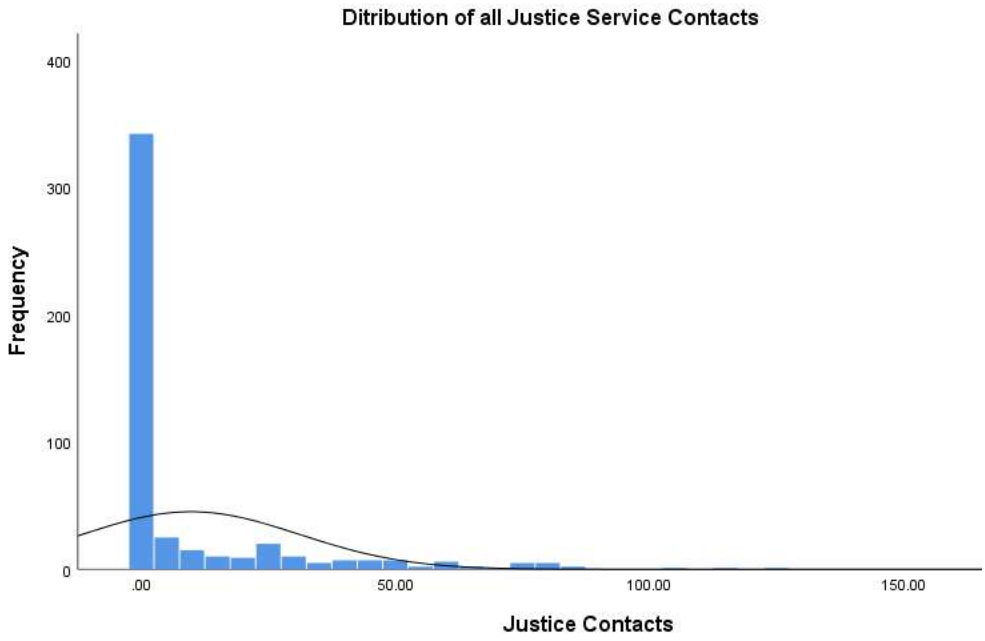
**Appendix N: Example syntax for Latent Profile Analysis**

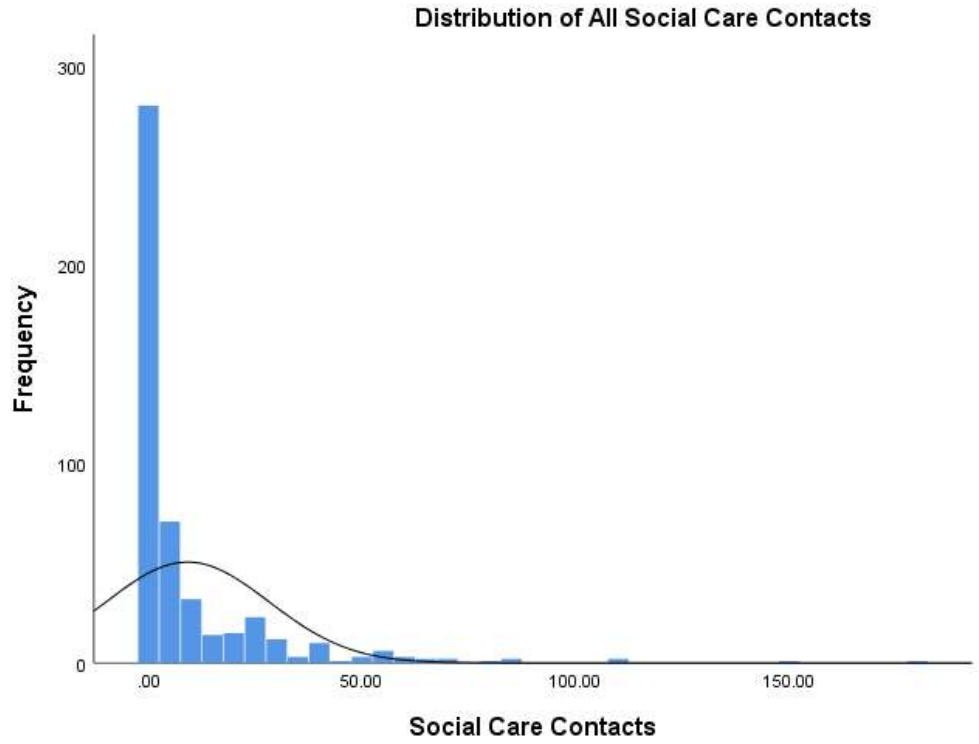
```
TITLE: LCA attempt 1

        DATA: FILE IS
        C:/Users/stevi/Desktop/Thesis statistics/Part 2
LPA/Fscores04053.dat;

        VARIABLE:

        NAMES IS
        ID PNO Age Sex Group Ethni  Site1 Site2
        SES  FSIQ Onset ABASP AntiSoc RuleNonC
        Aggress CrimIdent APQP PosP Incon Monit
        Punish ICUP Callous UnEmot UnCare SDQP
        Hyper ProSocSD Mood Antisocial SRDP SchoolD
        PeerDeli SubMis CalloSRD Offending Victim;
        USEV IS
        Onset AntiSocA RuleNonC Aggress
        CrimIdent Incon Monit Callous UnEmot
        Hyper Mood PeerDeli Offending Victim;
        CATEGORICAL IS
        Onset;

          MISSING = ALL (-999);

          CLASSES = c (3);
         ANALYSIS:
            tyPE = mixture;
            STARTS =0;
            optseed = 213532;
            processors = 4(STARTS);
            lrtstarts= 0 0 500 200;

            OUTPUT: tech14;

            Plot: type= plot1 plot2 plot3;
            series= AntiSocA (1)  RuleNonC (2) Aggress (3)
            CrimIdent (4) Incon (5) Monit (6) Callous (7) UnEmot(8)
            Hyper (9) Mood (10) PeerDeli (11) Offending (12)
            Victim (13);

      SAVEDATA: file is 3caselpaentropy842.dat
                  save= cprobabilities;
                  format= free;
```

## Appendix O: Histograms Demonstrating the Over Dispersion of the Count Data




Ditribution of all Justice Service Contacts
Frequency
400
300
200
100
0
.00
50.00
100.00
150.00
Justice Contacts


Distribution of All Social Care Contacts
Frequency
300
200
100
0
.00
50.00
100.00
150.00
Social Care Contacts

**Appendix P: Negative Binomial Regression Statistics**

**Summary table of Negative Binomial Regression statics assessing profile as predictor of service provision**

| | Comparison of P2 - Moderate Risk against P1 Low Risk | | | | | Comparison of P3 - High Risk against P1 - Low Risk | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | IRR | $\chi^2$ | df | p | n | IRR | $\chi^2$ | df | p |
| Total Multiagency Service Provision Intensity | 453 | 0.932 | 0.490 | 1 | .484 | 184 | .624 | 5.540 | 1 | .020* |
| Total CAMHS Service intensity | 462 | 0.799 | 4.280 | 1 | .040* | 191 | 0.510 | 9.083 | 1 | .003** |
| Clinical Psychology | 465 | 0.340 | 51.739 | 1 | .000*** | 193 | 0.544 | 4.249 | 1 | .039* |
| Counselling | 464 | 0.837 | 1.107 | 1 | .293 | 192 | 0.399 | 7.748 | 1 | .005** |
| Family Therapy | 483 | 1.806 | 8.137 | 1 | .004** | 195 | 0.474 | 1.800 | 1 | .180 |
| Psychiatry | 465 | 0.749 | 1.664 | 1 | .197 | 193 | 0.115 | 4.396 | 1 | .036 |
| Total Social Services Service Intensity | 457 | 1.806 | 0.635 | 1 | .425 | 189 | 0.741 | 2.139 | 1 | .144 |
| Social Worker | 459 | 1.072 | 0.417 | 1 | .518 | 191 | 0.836 | 0.716 | 1 | .368 |
| Family Support Worker | 463 | 0.923 | 0.500 | 1 | .480 | 191 | 0.709 | 2.244 | 1 | .134 |
| Substance Misuse Services intensity | 465 | 1.182 | 1.498 | 1 | .221 | 193 | 2.639 | 17.276 | 1 | .000*** |
| Total Justice Service intensity | 461 | 1.491 | 15.77 | 1 | .000*** | 189 | 0.823 | 5.501 | 1 | .333 |
| Youth Offending Team Worker | 537 | 1.562 | 21.335 | 1 | .000*** | 215 | 0.440 | 15.783 | 1 | .000*** |
| Probation | 465 | 1.622 | 62.619 | 1 | .000*** | | | | | |
| Total Out-of-Home placement | 463 | 1.301 | 5.180 | 1 | .023* | 191 | 3.374 | 34.236 | 1 | .000*** |
| Hospital Admission (days admitted) | 464 | 1.508 | 2.929 | 1 | .087 | 192 | 7.916 | 45.511 | 1 | .000*** |
| Residential Care | 465 | 0.904 | 0.729 | 1 | .393 | 192 | 0.055 | 28.892 | 1 | .000*** |
| Custody | 464 | 1.293 | 4.836 | 1 | .028* | 192 | 3.024 | 27.701 | 1 | .000*** |

Note: IRR= Incidence Rate Ratio; $\chi^2$ = Wald Chi Squared; df= degrees of freedom; ***p < .001; **p < .01; *p < .05.

**Appendix Q: Negative Binomial Regression Statistics**

**Summary table of Negative Binomial Regression Assessing Treatment Arm as a predictor of service provision**

| | Comparison of MAU alone against MST+MAU provision | | | | |
|---|---|---|---|---|---|
| | **n** | **IRR** | **$\chi^2$** | **df** | **p** |
| Total Multiagency Service intensity | 483 | 1.027 | 0.084 | 1 | .772 |
| Total CAMHS Service | 495 | 1.225 | 4.107 | 1 | .043* |
| Clinical Psychology | 498 | 1.228 | 3.254 | 1 | .070 |
| Counselling | 497 | 1.101 | 0.58 | 1 | .446 |
| Family Therapy | 519 | 1.931 | 13.493 | 1 | .000*** |
| Psychiatry | 464 | 0.837 | 1.107 | 1 | .293 |
| Total Social Services Service Intensity | 490 | 1.418 | 13.387 | 1 | .000*** |
| Social Worker | 492 | 1.158 | 2.228 | 1 | .136 |
| Family Support Worker | 496 | 1.622 | 21.625 | 1 | .000*** |
| Substance Misuse Services intensity | 498 | 0.883 | 1.046 | 1 | .306 |
| Total Justice Service intensity | 492 | 0.925 | 0.71 | 1 | .399 |
| Youth Offending Team Worker | 573 | 1.499 | 21.244 | 1 | .000*** |
| Probation | 498 | 2.59 | 42.625 | 1 | .000*** |
| Total Out-of-Home placement | 496 | 0.827 | 3.378 | 1 | .066 |
| Hospital Admission (days) | 497 | 2.392 | 20.071 | 1 | .000*** |
| Residential Care (days) | 497 | 1.066 | 0.342 | 1 | .559 |
| Custody (days) | 464 | 8.807 | 0.732 | 1 | .003** |

Note: IRR= Incidence Rate Ratio; $\chi^2$= Wald Chi Squared; df= degrees of freedom; ***p < .001; **p < .01; *p < .05.

## Appendix R: Syntax for Mixed Effects Poisson Regression in Stata

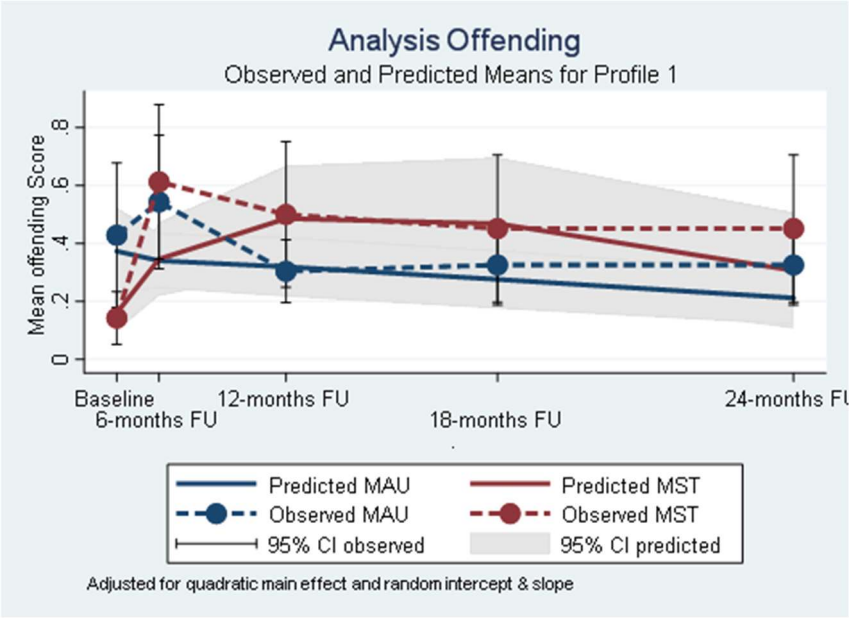
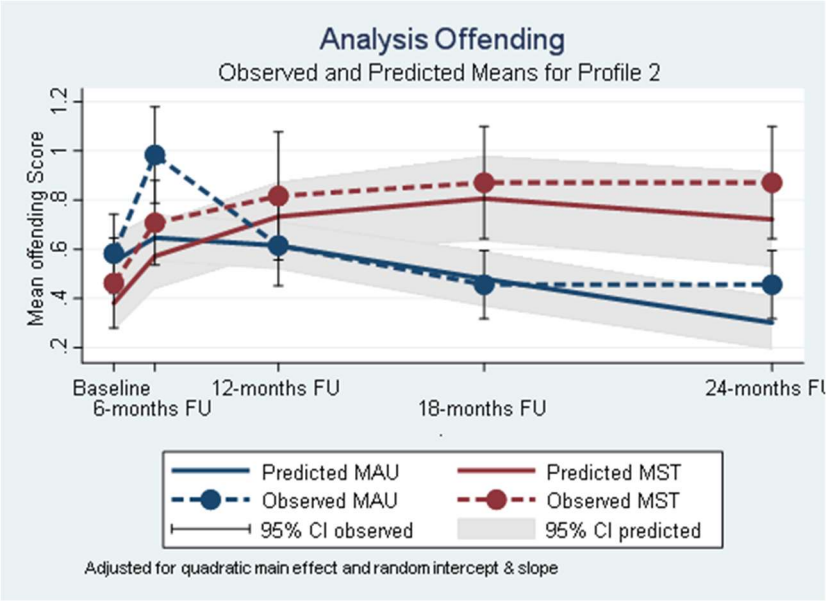
*Mepoisson offending arm##profile##time  c.time2##arm##profile || id:time, irrr vce(robust) cov(unstr) iterate (30).*

Demonstrating that time (linear and quadratic), arm and profile were added as fixed effect and interactions were requested and time and participant ID were added as random effects.

# Appendix S: Mixed Effects Poisson Regression

**Summary table of Mixed Effects Poisson Regression of Objective Offending Data**

| Effect | Variable | n | IRR | Z | p |
|---|---|---|---|---|---|
| Independent | | | | | |
| | Time (Linear) | 483 | 1.322 | 1.17 | .240 |
| | Time (Quadratic) | 483 | 0.861 | -2.68 | .007** |
| | Arm | 483 | .524 | -1.60 | .109 |
| | Profile | 483 | 1.726 | 1.73 | .084 |
| Interactions | | | | | |
| | Time(Linear) and Arm | 483 | 2.108 | 2.42 | .015* |
| | Time (Quadratic) and Arm | 483 | .861 | -2.68 | .039* |
| | Time (Linear) and Profile | 483 | 1.273 | 0.88 | .377 |
| | Time (Quadratic) and - Profile | 483 | .916 | -1.32 | .187 |
| | Arm and Profile | 483 | 1.257 | 0.49 | .623 |
| | Arm, Profile and Time (Linear) | 483 | .580 | .-1.48 | .138 |
| | Arm, Profile and Time (Quadratic) | 438 | 1.200 | 2.06 | .040* |

*Note: IRR= Incidence Rate Ratio; Z = Z-test; ***p < .001; **p < .01; *p < .05.*

## Appendix T: Graphs demonstrating three-way interaction effect between Treatment Arm, Profile and Time