Examining the Efficacy of *Tuning Relationships with Music™* in Helping Parents with a History of Interpersonal Trauma Reduce Conflict and Improve Emotional Responsiveness with their Adolescent

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Submitted in total fulfilment of the requirements of the degree of Doctor of Philosophy

July 2018

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Abstract
Parents who have experienced interpersonal trauma in childhood often struggle with relational functioning including difficulties with nonverbal communication (NVC), which may influence their ability to remain regulated during parent-child interaction. The challenges of parenting an adolescent may trigger memories of maltreatment, intensifying conflict, resulting in negative cycles of relating and poorer responsiveness to emotions when parenting. The thesis first explored existing knowledge about NVC in parent-child relationships. Then, the efficacy of *Tuning Relationships with Music™* (TRM), an intervention developed by the author for parent-adolescent dyads experiencing heightened conflict where the parent has an interpersonal trauma history, was examined. TRM was expected to reduce conflict and adolescent mental health difficulties and improve parent responsiveness and emotion coaching. A randomised control (RCT) design was used where 26 parent-adolescent dyads were recruited from community services. Dyads were randomly allocated into intervention or wait-list control, completing self-report and observational measures at baseline, and again four months later.

The thesis includes three studies. Study 1 reviews the literature about how nonverbal communication (NVC) is assessed and intervened with in parent-child relationships, in order to inform TRM development. Results showed that reliable and validated NVC assessment tools are not routinely used to inform intervention development or measure effectiveness, and that very few interventions directly target parent-child NVC.

Study 2 reports on outcomes from the RCT of TRM, which found dyads that participated in TRM reported significantly reduced conflict, and parents were clinically observed to be less reactive and more responsive compared with dyads in the control condition. Although parents reported they were less dismissive and punitive, and more encouraging of their adolescent’s emotions, and both parents and adolescents reported improvements in the young person’s mental health, these were not statistically significant.
Study 3 examined dyads as a single dynamic system during nonverbal conflict interaction, and aimed to examine relationships between parents’ trauma history, parent-adolescent conflict, parents’ reactivity and non-responsiveness, and dyads’ emotion regulation, consistency and predictability. A second aim was to discover whether TRM’s focus on NVC and emotion regulation would have an impact on post-intervention dyads’ nonverbal conflict interaction compared with controls. State space grid analyses showed that where parents reported higher levels of parent conflict this was correlated with predictable NVC sequences while dyads were emotionally dysregulated, and parents’ reactivity was correlated with dyads’ inconsistent NVC. Post-intervention dyads were more emotionally regulated, consistent and predictable during their nonverbal conflict interaction.

Findings have important implications for intervention with parent-adolescent dyads where a parent has a childhood interpersonal trauma history, suggesting that a systemic focus on NVC and emotion regulation may assist dyads to reduce conflict and increase responsive interaction. This thesis makes a contribution to existing understandings of the systemic dynamics of parent-adolescent conflict where a parent has experienced interpersonal trauma, suggesting that using music to improve emotion regulation and NVC may reduce conflict and improve parents’ responsiveness in parent-adolescent relationships. Further research of TRM with a larger sample will be useful, to determine whether a focus on nonverbal processes may improve relational functioning.
Declaration

This is to certify that:

1. The thesis comprises only my original work towards the Doctor of Philosophy except where indicated in the Preface.

2. Due acknowledgement has been made in the text to all other material used.

3. The thesis is less than 100,000 words in length, exclusive of tables, figures, bibliographies, and appendices.

Vivienne Colegrove

Date: July 13, 2018
Preface

This thesis is composed of three journal articles, which are preceded by a review of the literature and detailed description of Tuning Relationships with Music™, and followed by a general discussion. Journal articles were co-authored and published as follows:


All materials presented in the journal articles, including the literature review, method, analyses, and discussion of the findings were originally conducted and written by Vivienne Colegrove. Her supervisor (Dr Sophie Havighurst) provided advice. Dr Christiane Kehoe (second supervisor) provided assistance with statistical analyses and advice about final drafts. Dr Stine Jacobsen provided inter-rater reliability coding for the Assessment of Parent-Child Interaction observational measure used in Study 2.

In addition to publications listed above, findings from Study 2 were presented at the 15th European Society for Traumatic Stress Studies conference in Denmark in June 2017 (‘Tuning Relationships with Music™: Preliminary findings from a pilot randomised controlled trial’), and at the International Childhood Trauma Conference in Melbourne in July 2018 (‘Tuning Relationships with Music™ intervention for parents with a trauma history and their adolescent: Outcomes of a randomised controlled pilot study’).
Acknowledgements

First, I wish to express my immense gratitude to my primary supervisor, Associate Professor Sophie Havighurst. Sophie, your unfailing support and confidence in my ability to take on this challenging project made my entire PhD experience amazingly positive and productive, and carried me through times of overwhelm and discouragement. I also want to thank my second supervisor, Dr Christiane Kehoe. Christiane, your help with statistical analyses and critical eye at the later stage of drafts was particularly appreciated, as was your positive and timely responses to my queries. I thank Associate Professor Stine Lindahl Jacobsen for her generous and valuable support in the use of her assessment measure, including provision of interrater reliability coding. I also thank Cherie Baxter for her help with interrater reliability coding for the assessment tools developed for this thesis. Cherie, your clinical expertise was evident in how you approached this task, and your thoughtful and insightful questions helped me to articulate the coding process more clearly. Thanks to Tom Hollenstein too, for his help with using the GridWare software program for state space grid analyses.

I am so grateful to my wonderful wife Bronte, without whom I could not have completed this project. Thankyou for your endless patience and support, and being a sounding board for all of my formative ideas! I am also grateful to friends and our two little dogs who helped me to have fun and provided much needed work/life balance.

I would also like to thank the staff at Mindful, Centre for Training and Research in Developmental Health, and the Tuning in to Kids/Teens team. Special thanks to Ann Harley, Dr Katherine Wilson and Ross Couper-Johnston for your feedback in response to my practise presentations, and your encouragement along the way. Thank you to Wendy Bristow, librarian extraordinaire for at times going well above and beyond the call of duty to respond to my many and varied requests for articles and books! Thanks too to Fay Evans and her
daughter Celeste for volunteering to be a test family for my training to become accredited in
the use of the Assessment of Parent-Child Interaction Tool.

I would also like to thank the clinical and administrative staff at Headspace
Craigieburn and Anglicare Preston, Broadmeadows and Craigieburn. I would specially like to
thank Brendan Pawsey, Patricia Reck and Rosie Downs for their support and referrals.

Finally, I would like to thank the parents and adolescents who gave generously of
their time by participating in the research study. This thesis would not be possible without
you!
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Chapter 1: Introduction

Parents with a history of childhood interpersonal trauma, defined as repeated abuse or neglect committed by someone trusted or depended upon (van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005), often struggle in responding to their own children. They are more likely to be harshly punitive (Lieberman, Van Horn, & Ghosh Ippen, 2005) and to negatively attribute angry, threatening or coercive intentions to their children (Schechter et al., 2014).

Unresolved trauma can interfere with processes related to optimal caregiving (A. N. Schore, 2001) at a neurobiological, emotional and behavioural level. This can affect parents’ ability to respond in ways that promote and coach their children’s emotional competence (appropriate emotion understanding and regulation) (Eisenberg, Cumberland, & Spinrad, 1998). Parents experiencing emotional numbing or avoidance consequent to childhood interpersonal trauma may be further compromised in their capacity to notice, then respond consistently and sensitively to children’s nonverbal and verbal auditory and visual cues that signal their emotional state (Schechter et al., 2014).

Parents who struggle with nonverbal emotion recognition and expression are more likely to overprotect or parent intrusively (Thorberg, Young, Sullivan, & Lyvers, 2011), or to use unsupportive parenting strategies (Cuzzocrea, Barberis, Costa, & Larcan, 2015) when their children experience emotions. Their children may therefore not learn effective ways to express emotions, or to accurately interpret others’ nonverbal expressions. Children can then experience difficulties regulating emotion in the parent-child relationship and other social contexts. These difficulties have been associated with mental health problems in children and adolescents, including depression (van Beek & Dubas, 2008) and social anxiety (McClure & Nowicki, 2001). Parents’ and adolescents’ interlocking difficulties with recognising, accurately interpreting and responding to the other’s nonverbal cues may mean that mutually
regulating and enjoyable interactions are not able to develop. Instead, maladaptive interactions that reinforce emotionally dysregulated responses become entrenched. Processes such as reciprocal nonverbal communication of anger may further exacerbate these interactions, which are associated with greater parent-adolescent conflict (Eisenberg et al., 1998).

Negative cycles of interaction may escalate in both prevalence and intensity when a child reaches adolescence, which is often an emotionally challenging time for families (K. J. Kim, Conger, Lorenz, & Elder Jr, 2001). Parents with an interpersonal trauma history may experience their adolescent’s normal strivings for autonomy and independence, and increased emotionality as rejecting and reminiscent of earlier abuse or neglect (van Ee, Kleber, & Jongmans, 2015). As a result, conflict may remain heightened and unresolved, with detrimental implications not only for open parent-adolescent communication, but also for the adolescent’s social, emotional and behavioural functioning (Moed et al., 2014) and mental health (Crowell et al., 2013).

This group of parents may represent a significant proportion of the community. A systematic review of research into the prevalence of physical, sexual, emotional abuse and neglect in Australia found that 8.9% of children under the age of 18 years have been subject to physical abuse, 8.7% to emotional abuse, 6.4% to penetrative sexual abuse, 21.8% to non-penetrative abuse, and 2.4% to physical neglect, with higher prevalence for girls across all forms of maltreatment (S. Moore et al., 2015), and these estimates are likely to be conservative (Mathews et al., 2016).

Existing treatments developed for Posttraumatic Stress Disorder (PTSD) that may be required as a result of childhood abuse usually focus on processing of specific traumatic memories, but do not typically target interpersonal difficulties that may compromise parental functioning (Cloitre, Koenen, Cohen, & Han, 2002). Adults with a history of childhood interpersonal trauma are often excluded from clinical trials used to develop an evidence-base,
due to the complexity of their problems (Corrigan & Hull, 2015). It is estimated that an average of 44% of clients seeking treatment for trauma symptomatology that may have developed consequent to childhood interpersonal trauma drop out prematurely (Imel, Laska, Jakupcak, & Simpson, 2013), suggesting that existing evidence-based treatment may not fully meet the needs of this population.

Parent-adolescent conflict in the context of identified adolescent emotional, behavioural and/or mental health difficulties is routinely addressed via systemic methods (Kaslow, Broth, Smith, & Collins, 2012), which understand parent-adolescent conflict escalation as a function of a self-organising and dynamic relational system where the more established a pattern of interaction, the more resistant it is to change (Granic & Hollenstein, 2003). Where interactions are deemed maladaptive, intervention focuses on providing feedback that will interrupt the dysfunctional parent-adolescent system (e.g., teaching skills in managing negative emotions), rendering it more sensitive to change toward more adaptive interactive states (Granic & Hollenstein, 2003). Evidence-based systemic therapies have not been developed to address the challenges faced by parents with a trauma history; instead, existing interventions have been modified to meet their needs (A. Carr, 2014). Parents receiving treatment for Posttraumatic Stress Disorder (PTSD) may be offered family therapy that incorporates evidence-based interventions such as Trauma-Focused Cognitive Behavioural Therapy (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013) as part of an integrated approach. Therapies for children who have experienced trauma include working with parents, and may address parental trauma where it impacts on the parent-child relationship (Lieberman & Van Horn, 2005). However, evidence of the effectiveness of interventions that address parenting difficulties for parents with a trauma history is limited (Maliken & Katz, 2013). A review of the research on challenges and treatment for parents with PTSD recommends systemic approaches that highlight the restoration of safety, re-establishment of secure attachment relationships and regulation of arousal in response to
trauma triggers evoked by parent-child interaction (van Ee et al., 2015). These recommendations may also apply for parents with a history of childhood abuse or neglect, who may not meet criteria for PTSD, and/or may exhibit comorbid conditions (van der Kolk et al., 2005). Achieving these goals may require attention to parent emotion socialisation practices that are known to shape children’s emotion regulation and nonverbal processes that may drive negative escalating cycles (Colegrove & Havighurst, 2017). Therefore an approach focusing on teaching emotion socialisation and nonverbal communication skills may be indicated when intervening therapeutically with parents who have experienced childhood interpersonal trauma and their children.

Nonverbal communication may be thought of as a ‘musical’ process where rhythm, pitch, tone and volume of the voice are used to convey inter-subjective recognition and sharing of emotional states (Stern et al., 1998). Music is used by parents in all cultures to engage children in responsive patterns of relating (Nakata & Trehub, 2004), and is extensively utilised by adolescents to communicate and manage emotions (Hallam, 2010). Music both activates and deactivates amygdala activity (Koelsch & Siebel, 2005), and modifies heart and respiration rates to assist relaxation and stress reduction (Chanda & Levitin, 2013). Music may therefore help parents learn how to respond to their child’s nonverbal communication (S. Jacobsen, McKinney, & Holck, 2014), and enhance emotion regulation strategies for both parent and adolescent (Fancourt, Ockelford, & Belai, 2014).

Tuning Relationships with Music™ (TRM) is an intervention developed by the author to address parent-adolescent conflict where a parent has experienced childhood abuse or neglect, using music to target nonverbal communication as a part of effective interpersonal functioning. This thesis aims to evaluate the effectiveness of TRM in increasing responsive parent-adolescent interactions, and reducing conflict, parent emotion dismissiveness and adolescent mental health difficulties. In addition, because existing interventions have not directly targeted nonverbal elements of parent-adolescent conflict interaction where a parent
has a history of interpersonal trauma, little is known about the nonverbal characteristics of their conflict interactions, or which nonverbal processes may be targeted for change. Therefore this thesis also aims to explore associations between parents’ childhood trauma experiences, parents’ and adolescents’ reports of conflict in their relationship and the quality of their nonverbal conflict interactions, and to examine how these may change after participation in TRM. This can assist clinicians and researchers to further understand the dynamics of parent-adolescent conflict where a parent has a history of interpersonal trauma (Lewis, Lamey, & Douglas, 1999), and to identify whether TRM may be effective in addressing these.
Chapter 2: Literature Review

This chapter is a review of the literature that will determine the theoretical and clinical evidence for why Tuning Relationships with Music™, an intervention focusing on nonverbal communication of emotions may be beneficial for conflictual parent-adolescent dyads where a parent has experienced childhood interpersonal trauma. The review begins with a section on interpersonal trauma in childhood, including how it is defined, and how adaptations to childhood interpersonal trauma effect bio-psychosocial development, health and relationships. Second, the effects of childhood interpersonal trauma on parenting and parent-adolescent relationships are described, with reference to parents’ bio-psychosocial, attachment, mentalisation and nonverbal communication challenges. Third, a review of evidence-based therapies for adults with childhood interpersonal trauma is outlined, describing individual treatments for Posttraumatic Stress Disorder, Complex Posttraumatic Stress Disorder, and comorbid conditions known to be associated with a childhood interpersonal trauma history. Relational, parent and family therapies are then considered. Fourth, the role of music and music therapy in positively influencing bio-psychosocial processes, health, nonverbal communication and parent-adolescent relationships is explored. Finally, the research aims and objectives for this PhD are outlined, and the papers presented in chapters 4, 5 and 6 are described.

2.1 Childhood Interpersonal Trauma

Childhood maltreatment occurs in interpersonal environments characterised by frequent, unpredictable and ongoing exposure to violence (Frewen et al., 2013), damaging a child’s core sense of self, others and relationships (A. N. Schore, 2001), and therefore may be described as relational in nature. Relational trauma has a much more severe impact than trauma perpetrated by strangers, and has been described as a ‘betrayal trauma’ when committed by someone trusted, close, or depended upon (Hulette, Kaehler, & Freyd, 2011; A. N. Schore, 2002). When a child experiences harm because others have violated social norms,
this has been defined as ‘interpersonal victimisation’, where “elements of malevolence, betrayal, injustice and immorality are more likely to be factors than in accidents, diseases, and natural disasters” (Finkelhor, 2008, p. 23). A comprehensive definition of interpersonal trauma in childhood is utilised by D’Andrea, Ford, Stolbach, Spinazzola and van der Kolk (2012), who alternate the terms ‘victimisation’ and ‘interpersonal trauma’ to refer to “the range of maltreatment, interpersonal violence, abuse, assault and neglect experiences encountered by children and adolescents, including familial physical, sexual, emotional abuse and incest; community-, peer-, and school-based assault, molestation, and severe bullying; severe physical, medical, and emotional neglect; witnessing domestic violence; as well as the impact of serious and pervasive disruptions in caregiving as a consequence of severe caregiver mental illness, substance abuse, criminal involvement, or abrupt separation or traumatic loss”, therefore capturing relational trauma across the broad range of community relationships that shape children’s experiences and development (D'Andrea, Ford, Stolbach, Spinazzola, & van der Kolk, 2012, p. 188).

2.1.1 Developmental adaptations to childhood interpersonal trauma.

Where survival is dependent on maintaining the relationship with an abuser, dissociative responses and active processes of choosing to forget the abuse are adaptive (Goldberg & Freyd, 2006). Children may experience difficulties with regulating emotion, impulse control, attention problems, changes in consciousness (dissociation and amnesia), distorted self-perception and perceptions of the perpetrator, problems in relationships with others, altered attributions, loss of a sense of meaning, and somatisation as a result of interpersonal trauma (Herman, 1992; van der Kolk, 1994). These difficulties often coexist and persist through to adulthood, and are more severe in direct proportion to the number of types of traumatic stressors experienced (Finkelhor, Omrod, & Turner, 2009). Emotional and behavioural disturbances that function as an attempt to cope with overwhelming negative affect (D'Andrea et al., 2012) or perceived environmental threats (Beauchaine, Gatze-Kopp,
& Mead, 2007) are driven and exacerbated by problems with disrupted executive functioning (Cromer, Stevens, DePrince, & Pears, 2006), oversensitivity toward and/or misinterpretation of nonverbal emotional expressions (Hill Goldsmith, Pollack, & Davidson, 2008), and distorted attributions about oneself and the world (Turner, Finkelhor, & Omrod, 2009). These problems render children more likely to experience low self-esteem (J. Kim & Cicchetti, 2004) and poor self-efficacy (Bolger, Patterson, & Kupersmidt, 1998), and create interpersonal difficulties which may confer vulnerability to additional maltreatment throughout their lifespan (S. N. Gold et al., 2001; Riggs, 2010). As adults, these difficulties both maintain and intensify maladaptive patterns of interaction, which may put them and their own children at risk of further abuse (Crittenden, 2008; Mead, Beauchaine, & Shannon, 2010). Adaptations to childhood interpersonal trauma therefore affect children’s behavioural, cognitive, emotional and social development, causing not only immediate but also long-term distress and difficulties with functioning that are likely to impact future experiences of parenting, thereby contributing to intergenerational transmission of trauma.

The impact of interpersonal trauma may be considered to fall within four broad categories: these are emotion dysregulation and impulse control, problems with attention and consciousness, distorted perceptions and attributions, and interpersonal problems (D’Andrea et al., 2012). Each of these difficulties may derail optimal bio-psychosocial development (Perry, Pollard, Blakley, Baker, & Vigilante, 1995), can interact to cause more complex problems (Cloitre, Miranda, Stovall-McClough, & Han, 2005), and are significantly more severe when abuse or neglect began at a young age and occurred over time (Schoedi et al., 2010).

Emotion dysregulation and impulse control. Children and adults who have experienced childhood interpersonal trauma may experience a number of emotional and behavioural problems; these may include emotional lability, inability to experience pleasure, flattened or numbed affect, sudden angry outbursts, and expression of emotions that seem to
be a disproportionate or incongruent response to external circumstances (D’Andrea et al., 2012). Withdrawal, vulnerability to self-harm, substance use, and compulsive, aggressive and/or oppositional behaviour may represent behavioural expressions of these difficulties (Glaser, 2000). These are thought to represent attempts to cope with being emotionally overwhelmed, or to manage negative emotions (Cloitre et al., 2005). Responses may be intensified by hypersensitivity or under-responsiveness to the emotional expressions of others (C. Masten et al., 2008; Pollack, Cicchetti, Hornung, & Reed, 2000). Emotional and behavioural dysregulation or suppression may further be understood from an evolutionary development perspective as survival-based fight or flight responses, with more extreme behavioural or emotional collapse or disorganisation representing a freeze response, developed as an adaptation to severe and ongoing environmental threat where overpowering or escaping an aggressor is not possible (Mead et al., 2010; Porges, 2003a). Parents who become easily emotionally overwhelmed and at the mercy of automatic fight, flight or freeze responses consequent to childhood trauma experiences may therefore find it difficult to regulate their emotions and responses when interacting with their adolescent.

Problems with attention and consciousness. Children and adults often learn to use thought suppression, minimisation and denial to alter states of consciousness in order to render experiences of childhood interpersonal trauma endurable (Herman, 1992), and these strategies may induce states of dissociation and depersonalisation, whilst also creating problems with memory and concentration (A. N. Schore, 2002). These may manifest behaviourally as problems with inattention and impulsiveness (Beauchaine et al., 2007), difficulties with performing tasks requiring response inhibition (Carrion, Garrett, Menon, Weems, & Reiss, 2008), and compromised ability to plan or problem-solve (Zilberstein, 2013). Responses may become automatic and entrenched, limiting memory formation and access to information required to perform cognitive tasks (Ayoub et al., 2006). Where environments are perceived as hostile or emotionally demanding, these may be experienced
as reminders of earlier abuse, and therefore increase the frequency and intensity of dissociative responses (D'Andrea et al., 2012). Parents using these strategies to manage childhood interpersonal trauma experiences may struggle to remain present and responsive to their adolescent, especially where they perceive their adolescent’s developmentally normative emotionality and demands for autonomy as hostile or rejecting (van Ee et al., 2015).

**Distorted perceptions and attributions.** Children and adults who have experienced interpersonal trauma may develop understandings of themselves and the world that allow them to survive in a social order where they have low status (Platt & Freyd, 2015). Emotions such as generalised shame and guilt function to drive behaviours that appease aggressors with higher social standing, but may create associated problems with self-esteem, a tendency to attribute negative intentions to others, a poorly developed sense of self-efficacy, and an external locus of control (Benight & Bandura, 2004; Cloitre et al., 2005). These responses may combine to create pervasive difficulties with understanding who is responsible for one’s own behaviour and the behaviour of others (D'Andrea et al., 2012), and may mean that self-protective cognitions are not developed or sustained (Walter, Horsey, Palmerieri, & Hobfoll, 2010). Parents with a trauma history may therefore experience distortions in how they perceive their adolescent or their own parenting, and have a tendency to attribute negative intentions to their adolescent’s developmentally normative behaviour and emotional expressions (Dixon, Hamilton-Giacritsis, & Browne, 2005).

**Interpersonal problems.** Interpersonal problems following exposure to childhood interpersonal trauma may include difficulties with trust, ineffectiveness when negotiating power in relationships, negative expectations of others, increased sensitivity to criticism, an inability to hear others’ views, poor interpersonal boundaries, and a tendency to end relationships without negotiation (Cloitre et al., 2002; Greenman & Johnson, 2012). These problems may be maintained and heightened by feelings of intense rage that remained
unexpressed against perpetrators of abuse and others who did not prevent maltreatment from occurring, and extreme fear reactions that may not allow experiences of safety to develop (Herman, 1992). Interpersonal difficulties may additionally be considered an adaptive response to a hostile environment, where problems function to regulate distance and closeness in order to manage competing needs for safety and intimacy (Crittenden, 2006b). However, these strategies may create a negative cycle where failure to accurately judge others’ intentions and motivations leads to experiences of rejection or attack, which in turn may result in increased defensiveness, mistrust and isolation (Monson et al., 2012). These interpersonal difficulties may negatively impact parent-adolescent relationships, whereby a parent’s defensive or reactive responses generate an emotionally dysregulated response from their adolescent, setting in motion escalating negative and conflictual interactions which may become entrenched (Moed et al., 2014).

2.1.2 Neurobiological and health effects of childhood interpersonal trauma.

Adaptation to an abusive or neglectful environment early in life therefore comes at a significant cost not only to children’s development, but also to their wellbeing and future relationships. Altered neurological and biological processes underpin enduring emotional, cognitive, behavioural and relational difficulties (A. N. Schore, 2002). Disruptions in a broad array of brain and bodily structures and functions consequent to interpersonal trauma exposure at vulnerable times in children’s development are known to lead to neurobiological changes and subsequent mental health and physical health difficulties, and these effects have been found to be specific to childhood abuse rather than to any particular form of psychopathology (De Bellis & Zisk, 2014).

Neurobiological effects. Reviews of studies investigating neurological and biological changes consequent to interpersonal childhood trauma have summarised studies that examined differences in children and adults diagnosed with Posttraumatic Stress Disorder (PTSD) compared with those without PTSD (Pitman et al., 2012); compared groups
diagnosed with a range of mental health disorders consequent to childhood maltreatment (De Bellis & Zisk, 2014); and compared maltreated and non-maltreated populations without focussing on diagnostic criteria (Wegman & Stetler, 2009). A recent review found that maltreated groups had sensitised central nervous system and amygdala activity, extensive reductions in brain volume, and dysregulation of the neuroendocrine system due to changes in cortisol production – part of the stress response associated with flight/flight behaviour - after prolonged stress exposure (Musazzi & Marrocco, 2016). Excessive reactivity to minor triggers may be driven by an amygdala that has become over-responsive to threat-related cues (Rauch, Shin, & Phelps, 2006) combined with decreased frontal lobe functioning, which limits the capacity to be able to evaluate cues for threat based on previous learned experience when in an emotionally regulated state (Streeck-Fischer & van der Kolk, 2000). Prolonged production of cortisol has been found to reduce hippocampus volume, which causes memory problems (Weems & Carrion, 2007), and confers vulnerability to physical inflammation and depression (Danese, Pariante, Caspi, Taylor, & Poulton, 2007). A number of studies have shown reduced corpus callosum volume in abused children and adults diagnosed with PTSD, resulting in memory deficits and compromised left-right brain integration (De Bellis & Zisk, 2014; Saar-Ashkenazy et al., 2014). The neuroendocrine system regulates mood, stress response and the digestive and immune systems, and these can become chronically dysregulated where prolonged trauma exposure depletes cortisol levels (Bevans, Cerbone, & Overstreet, 2008). Studies have additionally shown that effects are dependent on the age when the trauma was experienced. For example, Anderson et al found that compared with a matched control group, women who had experienced sexual abuse had smaller hippocampus volume when abuse occurred in early childhood, reduced corpus callosum size when abuse occurred in middle childhood, and reduced prefrontal cortex volume if they were abused as adolescents (Andersen et al., 2008). The impact of interpersonal trauma on the developing
brain has therefore been demonstrated to have an impact on brain structures, and damage to these structures has been linked to mental health problems.

**Mental health problems.** While some children and adults exposed to childhood interpersonal trauma are diagnosed with PTSD, many more meet criteria for other psychiatric disorders, and clinicians and researchers have identified the need for a diagnostic conceptualisation that captures the range of symptoms related to problems with emotion regulation, impulse control, attention and dissociation, cognition, attributions and interpersonal relationships (Cloitre et al., 2011; Cook et al., 2005). Hypersensitivity to or avoidance of negative emotions, combined with impulsivity, increases the likelihood of aggressive behaviour, and this is linked with diagnoses associated with externalising symptoms such as Oppositional Defiant Disorder and Conduct Disorder (Ford et al., 2000). Emotional suppression or avoidance may lead to internalising symptoms, resulting in diagnoses of mood, eating, somatic or anxiety disorders (Hovens et al., 2012). Problems with attention due to dissociation may result in a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) being given, however studies have found that exposure to interpersonal trauma is not a consistent risk factor for ADHD (Ford et al., 2000), and that attention problems related to dissociation are more effectively treated by addressing dissociative symptoms directly (Endo, Suglyama, & Someya, 2006). Low self-esteem, negative cognitions and a diminished sense of control consequent to distorted perceptions about oneself and others mean that children and adults with an interpersonal trauma history are more likely to meet criteria for depressive and anxiety disorders (Heim & Nemeroff, 2001). Interpersonal problems, as well as creating lifelong trajectories of social isolation or alienation, may result in diagnoses relating to social dysfunction including Borderline Personality Disorder (BPD) (Cattane, Rossi, Lanfredi, & Cattaneo, 2017). BPD is a condition that is strongly correlated with self-reports of childhood interpersonal trauma (Herman, Perry, & van der Kolk, 1989); however a recent study found that the assumption that childhood
abuse causes BPD in adulthood was not supported, and indicated that BPD traits may be better explained by genetic vulnerabilities to internalising and externalising disorders (Bornovalova et al., 2013).

**Physical health problems.** Reviews of the literature about the effects of childhood abuse on physical health in adulthood found that experiences of interpersonal trauma in childhood were reliably associated with an increased risk of neurological, musculoskeletal, cardiovascular, respiratory and metabolic conditions, with more significant effects found for women than for men (Basu, McLaughlin, Misra, & Koenen, 2017; Wegman & Stetler, 2009). Increased risk is thought to occur due to the effects of repeated or prolonged stress exposure on multiple biological systems within the body (Cicchetti, 2012), vulnerability to high rates of re-traumatisation in adulthood – i.e., a woman with a history of physical abuse in childhood may be further physically injured while in an abusive intimate relationship (Ornduff, Kelsey, & O'Leary, 2001) - and because adults exposed to interpersonal trauma as children are more likely to engage in activities that negatively affect their health such as smoking, alcohol or drug use, and risky sexual behaviour (Ramiro, Madrid, & Brown, 2010). Studies that included assessments of emotional abuse or neglect reported larger effects than those that only assessed physical and/or sexual abuse (Arias, 2004). Trauma survivors frequently experience medically unexplained physical symptoms, thought to be caused by factors including prolonged and chronic elevated autonomic and emotional arousal, emotional suppression, and/or somatic expression of unbearable emotional distress in a way that may be deemed socially or culturally acceptable (Gilleland, Suveg, Jacob, & Thomassin, 2009; Herman, 1992).

### 2.1.3 Effects of childhood interpersonal trauma on attachment.

Interpersonal trauma is not only experienced within abusive or neglectful relationships, but may also affect experiences of future relationships, and various theoretical models help to provide some explanation for this. The response of families and social
networks to a child’s trauma experiences have been found to be more important than the
nature of the interpersonal trauma itself in determining how children are affected (Finkelhor,
2008). A primary caregiver’s response is thought to be the most important factor associated
with children’s recovery from interpersonal trauma exposure (Cook et al., 2005) and
attachment theory provides a way to understand this. Attachment theory is an evolutionary
concept developed by John Bowlby to explain the importance of the emotional bond between
a child and their primary caregiver, and the way in which this bond affects the child’s social,
emotional and cognitive development into adulthood (Bowlby, 1969). Attachment is
characterised by specific behaviours in a child, which include seeking proximity to their
caregiver when feeling upset or threatened. Optimal attachment behaviour in adults towards
their child involves responding sensitively and appropriately to the child’s needs (Bowlby,
1969), and in ways that promote and coach their child’s emotional competence (appropriate
emotion understanding and regulation) (Eisenberg et al., 1998).

Children form “internal working models” or mental representations of self, other, and
self in relation to others in the context of their earliest caregiving relationship. These working
models form a foundation from which children can develop capacities including emotional
competence, communication, curiosity, and a sense of agency (Bowlby, 1969, 1982). When
caregivers are either the source of abuse or neglect, or are unavailable to protect their
children from maltreatment as a consequence of their own unresolved traumatic experiences,
the attachment relationship can be severely affected, and children’s capacity to develop
functional internal working models is threatened (Bosquet Enlow, Egeland, Carlson, Blood,
& Wright, 2014). A primary caregiver may be preoccupied, distant, unpredictable or punitive
in a way that means s/he is either reactive and/or inconsistently responsive, resulting in
children becoming emotionally distressed. Children may then be unable to restore internal
equilibrium, and lack the trust necessary to elicit support from others, rendering them
vulnerable to developing many of the problems identified earlier in this review (Cook et al., 2005).

Children seek and maintain proximity to their primary caregiver in ways that have been classified as secure or insecure (avoidant or ambivalent), based on their experience of their attachment figure as either responsive and consistent, or inconsistent, unpredictable, non-responsive or reactive (Ainsworth, Blehar, Waters, & Wall, 1979). A fourth category of an insecure attachment style, called disorganised, was added to describe a child who displays behavioural disorganisation or disorientation such as freezing, undirected movement, or contradictory patterns of interaction with a caregiver (Main & Hesse, 1990). Disorganised attachment is thought to occur where a caregiver’s unresolved traumatic experiences causes them to engage in either frightened or frightening caregiving behaviour which may be confusing or alarming to a child (Solomon & George, 2011). This means that the caregiver is both the source of and solution to danger, and this paradox creates an unresolvable conflict for the child, resulting in their inability to mobilise behavioural or attentional coping strategies (Main and Hesse, ibid). Disorganised attachment is therefore a more severe and disturbed attachment pattern than the more organised ambivalent or preoccupied strategies, and has been associated with psychopathology including Reactive Attachment Disorder, depression, anxiety, behavioural problems, and dissociative symptoms (Liotti, 2004; Lyons-Ruth, Yellin, Melnick, & Atwood, 2005). The disorganised attachment construct has informed the development of a Complex Posttraumatic Stress Disorder diagnosis (Cook et al., 2005), currently being considered for inclusion in the International Classification of Disease, 11th revision (Brewin et al., 2017).

Attachment theory may therefore be extended to consider abnormal development and psychopathology where more extreme strategies may function self-protectively to ensure safety and comfort within a threatening environment. Crittenden’s dynamic-maturational model of attachment provides a theoretical explanation for why current maladaptive
behaviour or psychiatric symptoms become meaningful when considering the patient’s developmental history (Crittenden, 2009). Crittenden suggests that insecure attachment strategies will be amenable to change only when the individual is offered another way to be self-protective, and believes that it is safe to use alternative strategies (Crittenden, 2006b). Within this model, attachment strategies are viewed as having an adaptive function beyond puberty, most notably in sexual relationships in order to ensure reproduction and protection of offspring.

From an attachment perspective, achieving autonomy and developing positive internal representations of self and others necessary in order to navigate the individual and interpersonal demands of adolescence are most successfully supported by secure attachment and emotional connection to parents (Moretti & Holland, 2003). Parents who as a result of interpersonal trauma may have had insecure attachment relationships, may struggle to provide consistent and regulated emotional support to their adolescent, to support the adolescent’s needs for increasing autonomy, and to tolerate conflicts that emerge during the adolescent’s increasing assertion of differing viewpoints (Diamond, Diamond, & Levy, 2014).

2.1.4 Effects of childhood interpersonal trauma on mentalisation.

Attachment processes are related to the development of mentalisation or reflective functioning, defined by Fonagy and Target as “the development of the capacity to envision mental states in self and others” (Fonagy & Target, 1997, p. 679). Mentalising skills additionally involve inferring the emotional impact of mental states, which is related to the ability to empathise with others (Hooker, Verosky, Germaine, Knight, & D'Esposito, 2008), interpersonal emotion regulation skills (Grecucci, Gioggetta, Bonini, & Sanfey, 2013) and self-organisation (Fonagy & Target, 1997). Also referred to in the literature as ‘reflective functioning’ (Fonagy & Target ibid), the ability to appreciate that others have beliefs, emotions, drives, intentions and perspectives that differ from one’s own is considered critical
to optimal cognitive and socio-emotional development (Wellman, Cross, & Watson, 2001). Deficits in mentalisation are associated with a range of disorders including Autism Spectrum Disorder, Alexithymia, Schizophrenia, ADHD, and substance use (Koelkebeck et al., 2010; Korkmaz, 2011; Moriguchi et al., 2006; Uekermann, Channon, Winkel, Schlebusch, & Daum, 2007). Mentalisation has been identified as a major process that influences not only how a mental disorder originates and is maintained, but also may be implicated in recovery (Bateman & Fonagy, 2009).

The ability to mentalise is strongly influenced by the experience of threat or safety, and is suppressed when high emotional reactivity is activated in response to interpersonal situations perceived as threatening (Beyer, Munte, Erdmann, & Kramér, 2013). From an evolutionary perspective, reflective functioning necessitates a slower response than survival-enhancing flight, fight or freeze reactions, and therefore may be unhelpful when self-protective action is required (Porges, 2003b). Mentalising functions differently in attachment relationships compared with other social relationships, where perception of abandonment, loss of control or low status, or experiences of being emotionally invalidated may activate a sense of threat and therefore deactivate reflective capacity due to the impact of the flight/flight/freeze response on frontal lobe functioning (Liotti & Gilbert, 2011).

The capacity to mentalise emerges through interaction with a caregiver who is able to reflect accurately on their child’s intentions, and to moderate their affective responses to their child without overwhelming them (Sharp & Fonagy, 2008). Where a caregiver is unable to provide this experience, adverse experiences may become traumatic when compounded by the lack of the mind of an accessible other to provide the social referencing that enables a child to create a sense of meaning about frightening or otherwise emotionally overwhelming experiences (Allen, Lemma, & Fonagy, 2012). Where children are exposed to an abusive or neglectful caregiving environment, they learn that adults’ minds cannot be considered a reliable source of information, and that it is not safe to think about others’ mental states;
therefore preventing the development of the trust necessary for reflective functioning to be fostered (Fonagy & Allison, 2014). Individuals with a history of childhood interpersonal trauma may therefore experience mentalisation deficits that create enduring difficulties with understanding others and navigating their social world (Bateman & Fonagy, 2009). The ability to mentalise incorporates inferring another’s mental and emotional state from multiple sources, including nonverbal cues such as facial expression and direction of gaze (Frith & Frith, 2006), and processes such as nonverbal simulation of another’s emotional experience enhance the ability to experience empathy (Hooker et al., 2008).

2.1.5 Effects of childhood interpersonal trauma on nonverbal communication.

Nonverbal communication (NVC) skills, or the ability to accurately send and receive nonverbal information, are essential for managing relationships and fostering attachment (Nowicki & Duke, 2013). A caregiver’s understanding of their child’s emotions and intentions is communicated nonverbally from birth, through face to face exchanges of signals that convey emotions and create socially contingent interaction patterns through processes such as mirroring, vocal rhythm matching and interpersonal timing (Beebe, Lachmann, & Jaffe, 1997). NVC skills are thought to be neurologically underpinned by the mirror neuron system, whereby activation of premotor and posterior parietal areas of the brain allows others’ emotions and sensations to be simulated and therefore understood (Gallese, 2009). However, this theory has been contested as not reflecting the complexity and depth of neural activity involved in mirroring processes (Hickok, 2014).

Experiencing adverse early life experiences may interfere with processes that allow nonverbal information, including nonverbal aspects of trauma memories, to be clearly understood or communicated (Berenbaum, 1996; Jelenik et al., 2006). Unintegrated childhood trauma memories may remain mentally and emotionally inaccessible, and are therefore not available to be verbally discussed with others; however experiences may be communicated nonverbally via exaggerated or inhibited responses to current environmental
cues (van der Kolk, 1994). These nonverbal representations of trauma may negatively impact interpersonal relationships, and impede the ability to recognise, accurately interpret and sensitively respond to the emotional cues of others (Schechter, Myers, Brunelli, & Coates, 2006). One study found that in families where parents had communicated their trauma experience nonverbally with little verbal information given, adult children endorsed more interpersonal distress and experienced more problematic relationship patterns with their parents and spouses compared with those whose parents had discussed their trauma experiences with them (Wiseman et al., 2002).

Nonverbal processing difficulties have been associated with increased aggression (Magill-Evans, Koning, Cameron-Sadava, & Manyk, 1995; Russell, Stokes, Jones, Czogalik, & Rohleder, 1993), social anxiety (McClure & Nowicki, 2001), depression (van Beek & Dubas, 2008), and Social (Pragmatic) Communication Disorder (American Psychiatric Association, 2013) in children and adolescents. Nonverbal communication problems are further linked with children’s and adolescents’ mentalising, emotion regulation and behavioural difficulties. Children may become driven by unhelpful cycles of interaction where repeated misunderstanding of the nonverbal cues of others generates a negative response, which in turn reinforces children’s aggressive and emotionally labile reactions (Beauchaine et al., 2007; Sharp & Venta, 2012). Adults with deficits in nonverbal recognition and expression causing interpersonal problems may be diagnosed with Alexithymia (G. J. Taylor & Bagby, 2004) or Borderline Personality Disorder (Elliot et al., 2013). Individuals without previous NVC difficulties can experience changes in their ability to recognise the nonverbal expressions of others, or to effectively communicate nonverbally when experiencing depression or anxiety (Ellgring & Scherer, 1996).

In summary, NVC skills have been found to be of vital importance for health and wellbeing, children’s development, healthy relationships and interpersonal functioning, including for parent-child relationships and effective parenting. However, although many
studies refer to the importance of NVC when treating clinical groups, including individuals who have experienced interpersonal trauma, clinical studies that directly assess NVC difficulties in order to inform evidence-based trauma treatment were not found. Where NVC is recommended as a target for treatment, instructions may lack specificity. For example, a paper outlining treatment guidelines for children with complex trauma recommends dyadic work that involves therapist modelling use of touch and nonverbal gestures to tune into and respond to the child’s affect (Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005).

However, where a parent or caregiver has difficulties consequent to their own trauma experiences that affect their ability to communicate nonverbally, more assistance may be required than just modelling by the therapist. The next section will review evidence about the specific challenges related to parenting adolescents for parents with an interpersonal trauma history.

2.2 Parenting Adolescents after Childhood Interpersonal Trauma

Adolescence is generally a difficult time for families, with conflict peaking in frequency due to adolescents’ heightened emotionality and assertions of independence, which may elicit feelings of rejection and powerlessness for parents (Steinberg, 2000). Parents struggling with the sequelae of unresolved trauma may experience these as evocative of earlier abuse or neglect, and be triggered in a way that interferes with their capacity to provide a sense of safety and security for their adolescent (Crittenden, 2008; Lieberman, Van Horn, & Ghosh Ippen, 2005). Involuntary memories that invoke feelings and expressions of fright, or cause a parent to dissociate can be frightening for an adolescent (Solomon & George, 2011; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Parents may experience their adolescent’s distress or withdrawal as a posttraumatic trigger, and negatively attribute angry, coercive, threatening or neglectful intentions to their behaviour (Schechter et al., 2006). Parents with a history of childhood interpersonal trauma are more likely to be abusive towards their adolescent, and to under-estimate the effects of violence on them.
(Lieberman et al., 2005). Unresolved trauma may compromise a parent’s capacity to mentalise about their adolescent, in particular their ability to attune empathically or to think about their adolescent’s experience and psychological agency (Sharp & Fonagy, 2008). A parent may experience their adolescent’s developmentally normative strivings toward increased autonomy and independence, and increased emotionality (Klimes-Dougan et al., 2007; Yap, Allen, & Sheeber, 2007) as rejecting and reminiscent of earlier abuse (Casanova, Domanic, McCane, & Milner, 1994; A. N. Schore, 2001), meaning that negative conflict interactions may become heightened, more frequent and less amenable to resolution (K. J. Kim et al., 2001). Conflictual interactions that remain unresolved are detrimental not only to open communication in parent-adolescent relationships, but to a young person’s social and emotional development (Ehrlich, Richards, Lejuez, & Cassidy, 2015; Moed et al., 2014).

Parents’ challenges may provide an explanation for how intergenerational trauma is transmitted, summarised in one study as the traumatised parent’s inability to be emotionally or functionally available, therefore increasing the likelihood of their adolescent developing psychopathology (Schwerdtfeger & Nelson Goff, 2007). Intergenerational transmission of trauma has also been conceptualised as a cycle of abuse, referring to the increased risk that abused children will become abusive parents (Lyons-Ruth & Block, 1996). Some theorists have critiqued the intergenerational transmission of trauma hypothesis as being too limited, suggesting that the question “Under what conditions is the transmission of abuse more or less likely to occur?” may be more helpful, as it creates the opportunity to discover what factors may mediate risk and protect children and adolescents from intergenerational trauma exposure (Kaufman & Zigler, 1987).

Rather than locating problems within the parent or child, parent-child relationship difficulties (including in the context of intergenerational trauma transmission) have also been considered from a systemic perspective. Family systems theory assumes that the behaviour of a parent or child can only be understood by considering how that behaviour is both shaped by
and then in turn shapes other family members’ behaviour (e.g., one person responds in an emotionally dysregulated way to another’s expression of anger, which may then generate a further emotionally dysregulated expression of anger from the first person) (von Bertalanffy, 1968). Difficulties are theorised to be recursive, non-linear patterns within the dyad or family system, which are generated and maintained by structural characteristics e.g., belief systems, contextual factors such as presence or absence of other supportive relationships. Symptomatic behaviours are seen as either functioning to maintain stability where dyads are stuck in predictable patterns of interaction that may cause conflict, or conversely to perpetuate instability where interaction patterns are volatile and unpredictable (Vetere & Dallos, 2003). Some attention has been paid to issues faced by traumatised families, examining for example what factors may influence how effectively a family may respond to a traumatic event (Figley & Figley, 2009). From a systemic perspective, neglect or abuse may become entrenched in dyads or families as an unintended consequence of attempting to establish emotional equilibrium in the family system using aggressive dominant/submissive strategies that enforce a sense of control in order to achieve stability but in turn become an ongoing source of relational betrayal and injury, and the incapacity to return to using nurturing, care, relational repair or soothing of individuals’ emotional distress after stability has been established, therefore leaving the family system in a chronically dysregulated state (Holmes, 2017). However empirically derived systemic theory that may inform clinical practice when working with families where individuals are both traumatised and traumatising (e.g., where a parent has experienced interpersonal trauma in childhood and may find it difficult to respond sensitively to their child) has yet to be established, and the need for further research has been identified (MacKay, 2017).

The following section describes the challenges faced by parents with a history of childhood interpersonal trauma to parent in ways that promote optimal parent-adolescent
relationships and adolescent bio-psychosocial development, as well as protective factors, in order to consider where therapeutic intervention may be most effectively targeted.

2.2.1 Effects of parents’ developmental adaptations to childhood interpersonal trauma on parenting.

A parent’s abuse history has been found to be a significant predictor of risk for children and adolescents, and is related to aggressive or rejecting parenting practices (Dixon et al., 2005; Newcomb & Locke, 2001). Poor parenting following a childhood of abuse has been found to be associated with higher levels of parents’ overall stress, a negative sense of self (as a parent), difficulty establishing boundaries, a higher likelihood of permissive parenting, greater use of physical discipline, and an increased risk of verbally and physically abusing one’s own children (Riser, 2009). A mother’s sexual abuse history has been associated with negative communication styles, preoccupation with self, decreased involvement, inhibited emotional expressiveness, and intrusiveness during parent-child interactions (Lyons-Ruth & Block, 1996; Moehler, Biringen, & Poustka, 2007). Problems in parent-adolescent relationships where a parent has been diagnosed with PTSD include less affection and more controlling parent behaviour, parent aggression toward and/or withdrawal from their adolescent, and reduced parental sensitivity and responsiveness (van Ee et al., 2015). The above parenting behaviours may be understood as being driven by parents’ developmental adaptations to their childhood trauma experience – namely difficulties with emotion regulation and impulse control, problems with attention and consciousness, distorted perceptions and attributions, and interpersonal problems as outlined earlier in this review.

Parenting and emotion regulation difficulties. Emotion regulation has been defined as the ability to express, inhibit, or modulate one’s physiological or emotional state or behaviour in a given situation (Niven, Totterdell, & Holman, 2009), and is a vital component of managing parent-adolescent interactions effectively (Fabes et al., 1999). Problems with emotion regulation play an important role in functional impairment among adults with a
history of childhood interpersonal trauma (Cloitre et al., 2005), and influence the relationship between parental symptoms of posttraumatic stress (PTSS) and parenting (A. S. Masten & Osofsky, 2010). Parents who are unable to regulate their own emotions may experience problems employing effective parenting strategies (Sanders & Mazzucchelli, 2013). Parents with a trauma history may have difficulty identifying, labelling, and being aware of their own and their adolescents’ emotional states (V. K. Johnson & Lieberman, 2007), which is a crucial skill when engaging in parenting that supports adolescents’ emotional development (Gottman, Katz, & Hooven, 1996). Parents’ emotion regulation capacity has been found to significantly affect the association between parent PTSS and the way they promote and coach their adolescents’ expressions of emotion (Gurtovenko & Katz, 2017). Parents with an interpersonal trauma history can experience emotion regulation difficulties due to underlying hereditary genetic vulnerabilities that may be shared biologically with their adolescent (Hill Goldsmith et al., 2008). Parents may model ineffective regulation strategies, and lack the skills to teach their adolescent how to appropriately regulate their own emotions (Morris, Silk, Steinberg, Myers, & Robinson, 2007), with deleterious consequences for the development of the adolescent’s emotional competence. Parents’ posttraumatic symptomatology may therefore contribute to the development of adolescent socio-emotional and behavioural functioning difficulties (Katz & Gurtovenko, 2015).

**Parenting and problems with attention and consciousness.** Where parents with an interpersonal trauma history have learned to dissociate or suppress emotional states and cognitions, this is likely to manifest as insensitive or unresponsive parenting (Schechter et al., 2014), avoidance of emotional engagement with their adolescent and therefore reduced emotional availability (Schechter et al., 2005), and a tendency to withdraw when experiencing the parent-adolescent relationship as demanding or triggering (Pears & Capaldi, 2001). Parental dissociation can be frightening for a young person (Solomon & George, 2011; van IJzendoorn et al., 1999), and contribute to a relational environment where bonding
is perceived by both parent and adolescent as impoverished (Marsanic, Margetic, Jukic, Matko, & Grgic, 2014). Interruptions in parents’ capacity to remain present in situations requiring parental monitoring, guidance or protection may contribute to role reversal in parent-adolescent relationships (Field, Muong, & Schanvimean, 2013).

**Parenting and distortions of perception and attribution.** Altered cognitions such as a tendency to attribute negative intentions to others and difficulties with understanding who is responsible for one’s own or others’ behaviour can negatively affect parents’ perceptions of and attributions toward their adolescent children. Parents with a trauma history have been found to endorse distorted and insecure beliefs about their children including that the child is a source of threat (Forcada-Guex, Borghini, Pierrehumbert, Ansermet, & Muller-Nix, 2011; Schechter et al., 2004; van Ee, Kleber, & Mooren, 2012), meaning they are more likely to be more intrusive, hostile and controlling, or avoidant (Ionio & Di Blasio, 2013; Schwerdtfeger & Nelson Goff, 2007; van Ee, Skejpen, Kleber, & Jongmans, 2013) when interacting with their children. Studies have shown that parents with PTSD perceive their relationship with their children as poorer than parents without PTSD (Lauterbach et al., 2007), are more likely to experience their children as difficult in temperament and report high levels of stress in their parenting role (McDonald, Slade, Spilby, & Iles, 2011; Paley, Lester, & Mogil, 2013), and react fearfully to their children’s expressions of emotional distress (Schechter et al., 2005). These effects can be bidirectional, whereby a child’s behaviour in response to their parent’s negative attributions further activates the parent’s reactivity, driving sequences of reciprocal negative emotions that may cause and entrench heightened conflict interactions (Moed et al., 2014).

**Parenting and interpersonal problems.** Strategies developed in order to manage competing needs for closeness and safety in the context of an abusive or neglecting caregiving environment mean that parents with an interpersonal trauma history may struggle to regulate distance and closeness in their relationship with their adolescent child. Pears and
Capaldi (2001) suggest that parents with PTSD are likely to withdraw from interaction with their child in an attempt to avoid being physically abusive, and this behaviour is further pronounced in parents with more severe abuse histories and PTSD (Schechter et al., 2007). A parent may consequently be unavailable to soothe or otherwise emotionally regulate their child, placing the child at risk for developing maladaptive coping strategies to manage their distress (Lyons-Ruth & Block, 1996). A parent's alternating avoidant and intrusive behaviours, driven by a heightened attentional bias toward perceived threat either from the child or elsewhere in the environment (Schechter et al., 2004; Schechter et al., 2007) may shape a child's experience of their parent as a source of fear, meaning that experiences of safety within the parent-child relationship do not get an opportunity to develop (Tronick, Adamson, Wise, & Brazelton, 1978). The parent is therefore not available for a basic level of holding of the child, or scaffolding their learning at times of heightened emotions. The next section examines what is known about how neurobiological changes consequent to childhood interpersonal trauma affect parenting, and the implications of these for parent-child relationships and child biopsychosocial development.

2.2.2 Impact of parents’ neurobiological and health difficulties consequent to childhood interpersonal trauma on parenting.

The impact of childhood interpersonal trauma on parenting can further be understood from a neurobiological perspective, via processes whereby neuroendocrine, epigenetic and neuroanatomical changes stemming from prolonged trauma exposure in parents are transmitted to their children (Bowers & Yehuda, 2016). Physiological mechanisms may explain the relationship between parental PTSD and child biopsychosocial functioning (van Ee et al., 2015). These mechanisms may place children of parents with a trauma history at greater risk of developing physical, emotional, behavioural and cognitive problems, and effects may vary depending on the parent’s gender and age of their trauma experience (Yehuda et al., 2017).
**Impact of neurobiological changes.** Enduring epigenetic changes in parental biological systems that have arisen in response to trauma exposure are transmitted to children both in utero and during the postnatal period (Bowers & Yehuda, 2016). These can be seen to be functional from an evolutionary perspective in that they prepare children early in life to adapt to and survive in a hostile environment (Musazzi & Marrocco, 2016). Mothers with PTSD noted in one study that their children had greater distress in response to novel stimuli, and tests showed that children and mothers had lower cortisol salivary levels than mothers without PTSD symptoms and their children (Yehuda et al., 2005). Mothers’ heightened stress levels after birth have been found to contribute to how physiological symptoms are programmed in their children, causing changes in children’s levels of reactivity and recovery time after exposure to stress (Bosquet Enlow et al., 2014). Symptoms are underpinned by greater increases in cortisol and elevated HPA axis and amygdala activity in response to even mild stressors (S. R. Brand et al., 2010; Rauch et al., 2006). A review of studies examining physiological transmission of trauma concluded that parents’ traumatic experiences in childhood are associated with children developing a greater sensitivity to stress through biological mechanisms, and this creates further risk for children’s development of PTSD, depression or anxiety (van Ee et al., 2015). Parents and adolescents may therefore develop biologically driven patterns of interaction characterised by high levels of reactivity that are resistant to change, and indicative of intense and frequent parent-adolescent conflict that is damaging to adolescents’ socio-emotional development and functioning (Eisenberg et al., 1998).

**Impact of mental health problems.** Parental symptoms of PTSD have been found to be linked with both internalising and externalising problems in their children. These may include depression and anxiety, and behavioural problems associated with aggression and emotional dysregulation (Duad, Klinteberg, & Rydelius, 2008; Field et al., 2013; van Ee et al., 2012). Where parents have more severe childhood trauma experiences and posttraumatic
symptoms, this has been associated with children behaving more aggressively, displaying an attentional bias to threat, and being more likely to avoid conflict interaction (Schechter et al., 2007). Other studies, however, found no effect of parents’ PTSD symptoms on children’s cognitive development or adolescent social development (Ahmadzadeh & Malekian, 2004; van Ee et al., 2012), and it has been suggested that parent self-report measures may reflect the parent’s psychological state or sense of self, rather than their child’s developmental or health status (Najman et al., 2000; Banyard, Williams, & Siegel, 2003). Inconsistencies between parent report and observational measures of parent-adolescent interaction may also occur where problematic relational behaviours are not easily observable (Levendosky et al. 2003; Samuelson et al., 2017). Effects of parents’ PTSD symptoms on their children have been found to be similar to those where a parent has been diagnosed with depression or anxiety, and therefore cannot be considered unique to the parent-child relationship where a parent has a trauma history (McDonald et al., 2011; Yehuda et al., 2005). However, many adults who have experienced childhood interpersonal trauma either do not fit the PTSD diagnosis, or exhibit comorbid conditions including depression or anxiety (van der Kolk et al., 2005).

These difficulties experienced by parents diagnosed with depressive or anxiety disorders may also be associated with traumatic experiences. Difficulties underpinning mental health difficulties may also be understood from a transdiagnostic model of psychopathology. The transdiagnostic model may provide a useful framework to consider why so many individuals with trauma histories have comorbid mental health conditions. It may be in part because these mental health difficulties have common underlying mechanisms such as biological factors that lead to maladaptive emotional, cognitive or behavioural tendencies, deficits or biases in information processing e.g., attentional bias or memory processing, or psychological factors including emotion regulation difficulties due to chronic suppression or negative emotional reactivity (Nolen-Hoeksema & Watkins, 2011). Disruptions in emotions, cognitions and behaviour underlie a number of mental health disorders and may be a primary treatment
focus, as these are deemed to negatively affect parenting independent of diagnosis (Maliken & Katz, 2013). Parents diagnosed with Borderline Personality Disorder or Alexithymia may experience difficulties in recognising and accurately interpreting their child’s nonverbal expressions of emotions, resulting in a tendency to react negatively or unsupportively, or to be non-responsive (Cuzzocrea et al., 2015; Elliot et al., 2013; Nijssens, Luyten, & Bales, 2012).

**Impact of physical health problems.** A parent’s physical illness places not only practical but emotional and psychological demands on children, including parental unavailability, depleted financial resources, and disruptions to routines, and adolescents have been identified as a group at heightened risk (Korneluk & Lee, 1998). Adolescents are likely to shoulder additional family responsibilities or roles where a parent is unable to function, to the detriment of their normative developmental needs for independence and forming social connections outside of the family (Pedersen & Revenson, 2005). Adolescents who take on a caring role in families where a parent has a chronic illness or disability may experience educational as well as social and emotional disadvantage, where the demands of physically caring for an ill parent may erode time and energy available to attend school or social activities, or complete homework (Aldridge & Becker, 1999). Studies have found that young people’s mental health may be adversely affected by a parent’s physical disability – in particular increased vulnerability to depression or anxiety; however effects have been found to be largely due to contextual factors including the availability of social support, financial resources, parent and family functioning and a parent’s mental health diagnosis rather than the physical illness or disability per se (Krattenmacher et al., 2012; Krattenmacher et al., 2013; Neely-Barnes, Zankas, Delevega, & Evans, 2014). Where a parent experiences somatic symptomatology, this is somewhat related to a child’s tendency to somatise via processes of social modelling and mirroring, and parent emotion socialisation practices (Ebeling, 2001; Gilleland et al., 2009). The impact of parents’ neurobiological changes, mental health and
physical health problems may therefore influence children’s health and development via multiple pathways, and may also affect parents’ ability to provide experiences necessary for the formation of children’s secure attachment. The next section will look at these impacts in detail, considering parents’ difficulties in the context of their own insecure attachment strategies developed in childhood.

2.2.3 Impact of parents’ insecure attachment strategies on parenting.

Where parents have had to employ insecure or disorganised self-protective attachment strategies in order to cope with an abusive or neglectful caregiver in childhood, the experience of danger is central in organising their own caregiving behaviour (Crittenden, 2008). Crittenden suggests that caregiving responses are guided by ways of ensuring safety that were learned early in life and operate outside of awareness, and by early experiences where reflective processing of information created risk of exposure to danger. Crittenden’s dynamic maturational model of attachment (Crittenden, 2006b) proposes that parents’ unresolved trauma symptoms can be understood as functioning to create the experience of safety where this was not available, either by being dismissive (and therefore unresponsive to a child’s cues signalling distress), or preoccupied (and therefore reacting to a child’s nondistressed cues as though they indicated imminent threat). These symptoms mean that a parent may show disrupted patterns of interaction that induce a sense of fear in their child (Riggs, 2010). Symptoms may also mean that parents are less able to respond sensitively and contingently (Casanova et al., 1994) or to provide optimal socialisation of their children’s socio-emotional development and relational functioning (DeOliveria, Neufeld Bailey, Moran, & Pederson, 2004). Mothers with unresolved childhood interpersonal trauma experienced lower levels of attachment to and bonding with their child (Schwerdtfeger & Nelson Goff, 2007), and were poorly bonded with their adolescent according to adolescent report in two studies (Field et al., 2013; Marsanic et al., 2014).
Children of parents with unresolved trauma may be vulnerable to developing disorganised patterns of attachment and problems with emotion regulation as the result of parents behaving in a frightening or frightened manner (Brenning & Braet, 2012; Lyons-Ruth & Block, 1996). Disorganised attachment is considered to be a risk factor for developing a range of social and cognitive difficulties and psychopathology, though causal mechanisms between these are yet to be determined conclusively (Belsky & de Haan, 2011). A longitudinal research study utilising observational measures has found a relationship between parents’ posttraumatic symptoms and their children’s development of insecure attachment strategies (Bosquet Enlow et al., 2014), with a further study finding that PTSD moderates the relationship between a child’s insecure attachment status and insensitive parenting (van Ee, Jongmans, van der Aa, & Kleber, 2016). Others, however, have either not established a link between parents’ posttraumatic symptoms and children’s insecure attachment representations (Lyons-Ruth & Block, 1996), or found that parents’ posttraumatic symptoms may even be protective against an insecure attachment with their children where intrusive trauma re-experiencing and hypervigilance prevent dissociation (Hughes, Turton, McGauley, & Fonagy, 2006).

2.2.4 Impact of parents’ mentalising difficulties on parenting.

Mentalisation is thought to be shaped by attachment, and is regarded as the means by which the mother-child relationship influences a child’s attachment security, therefore affecting their social, emotional and cognitive development (Katznelson, 2014). Disorganised, avoidant or ambivalent attachment strategies may impair a parent’s capacity to mentalise about (understand and appreciate) their child’s experience (van Ee et al., 2016). When interacting with their child, parents with mentalising difficulties may struggle to remain emotionally regulated, and instead respond insensitively to their child’s expressions of emotion (Fonagy, Gergely, & Jurist, 2003). Negative or distorted mental representations mean that parents are likely to react to their child in a hostile, intrusive, negative, frightened
or frightening way (Schechter et al., 2004). Reflective functioning may be compromised during traumatic memory re-experiencing, therefore temporarily interfering with parents’ capacity to mentalise about their child in order to respond sensitively (Schechter et al., 2005; Schechter et al., 2006).

Studies have not found an association between PTSD, reflective functioning and problematic caregiving (Schechter et al., 2005; B. Sullivan et al., 2011); however parents with PTSD are less satisfied with the quality of their parenting and their relationship with their child (van Ee et al., 2013). Van Ee et al (2015) note that findings using self-report measures to ascertain parents’ satisfaction with their parenting and the parent-child relationship have not been compared with observational measures of either the parent’s functioning or the child’s wellbeing, and recommends that further research compares these in order to clarify results (van Ee et al., 2015). One study failed to find an association between reflective functioning and unresolved interpersonal trauma as measured by the Adult Attachment Interview (Levy et al., 2006), and the authors have suggested that lack of trauma resolution and mentalisation ability may operate independently.

While research has given considerable attention to parents’ mentalising capacity and children’s development, few studies focused on adolescents. A parent’s attribution of negative intentions to their child may be considered a form of distorted mentalising, and may maintain or cause aggressive behaviour in young people (Sharp & Fonagy, 2008). In one study, parental reflective functioning was correlated with adolescent (14 – 18 years) reflective functioning and social competence, but also with adolescent internalising problems and less positive self-esteem, indicating that parents’ reflective functioning may heighten adolescents’ awareness of negative as well as positive emotions (Benbassat & Priel, 2012). A follow-up study with the same cohort aged 18-22 years found that similar to previous findings, parental reflective function was associated with both benefits and costs to young adults, in that they were better able to navigate romantic relationships and give self-
description, but more likely to have internalising problems and less positive self-perception (Benbassat & Shulman, 2016). Another study found that parents’ perception of their adolescents’ thoughts and feelings were found to be associated with adolescents’ increased capability to resolve conflict (Hastings & Grusec, 1997), and a further study showed that mothers’ perspective-taking and support were associated with adolescents’ perspective-taking capacity and quality of peer relationships (Soenens, Duriez, Vansteenkiste, & Goosens, 2007). A parent’s mentalising capacity is therefore crucial for their child’s optimal biopsychosocial development into adolescence and early adulthood, and may rely in part on a parent’s ability to accurately read their adolescent’s nonverbal cues that signal their emotional experience and intentions. The next section will look at this more closely by focusing on the way parents’ difficulties with understanding their adolescents’ nonverbal communication may impact their parenting.

2.2.5 Impact of parents’ nonverbal communication difficulties on parenting.

The capacity to mentalise effectively is thought to depend as much on the ability to infer others’ intentions from nonverbal cues as from verbal information (Asen & Fonagy, 2017b). Parents’ ability to communicate nonverbally has been found to be associated with more parental sensitivity and lower levels of aggression, children’s increased responsiveness and willingness to engage with their parent, and children’s prosocial behaviours such as empathy and cooperativeness (Enns et al., 2015). Conversely, parents’ difficulties with recognising, accurately interpreting and responding to their child’s nonverbal expressions of emotion can compromise effective parenting (Asla, de Paul, & Perez-Albeniz, 2011; Elliot et al., 2013). Parents are more likely to overprotect and/or parent intrusively (Thorberg et al., 2011), and rely on dependency- and achievement-oriented strategies alongside authoritarian parenting (Cuzzocrea et al., 2015). Parents with nonverbal communication difficulties may not appreciate the impact of their own nonverbal expressions of emotion and responses such as vocal pitch and gesture (Bugental, 2005; Ellgring & Scherer, 1996), and the role these may
play in influencing their child’s behaviour (Casey & Fuller, 1994). Parents may give minimal or ambiguous nonverbal cues causing a child to miss or misinterpret their communication (Crittenden, 2008) and these miscommunications can then play a part in driving and maintaining reciprocal negative cycles of parent-child interaction (Moed et al., 2014).

Where parents are unable to decode or respond sensitively to their child’s nonverbal expression of emotions, they may not effectively respond to their child’s needs for support, protection, or regulation of emotions, physiology or behaviour; or to provide guidance about how to respond to external events (Pally, 2001). Parents may be ill-equipped to teach their child about nonverbal components of emotional awareness and expression, with negative consequences for the child’s development of emotional competence (Eisenberg et al., 1998). The parent-child relationship is the main context in which children’s nonverbal communication patterns are learned and reinforced. Therefore children may have not developed effective ways to express their emotions nonverbally, nor to understand others’ nonverbal expressions (Kliewer et al., 2016), and may be at risk for a range of emotional, behavioural and interpersonal problems and psychopathology. Children’s ineffective and/or dysregulated behavioural expressions of emotion may in turn be experienced as triggering of earlier traumatic experiences for parents, with negative consequences for their parenting and consequently the parent-child relationship. The following section reviews individual, relational and family therapies which have been developed for adults with a history of childhood interpersonal trauma, in order to determine what is available and has been found effective as well as to determine any limitations of these approaches.

2.3 Therapies for Adults with a History of Childhood Interpersonal Trauma

The cluster of symptoms experienced by adults who were exposed to interpersonal trauma in childhood are not currently accounted for by any single current psychiatric diagnosis in the Diagnostic and Statistical Manual, used to inform assessment and therapeutic intervention (American Psychiatric Association, 2013; D'Andrea et al., 2012). The current
诊断中识别为创伤前驱因子的诊断包括创伤后应激障碍（PTSD）和极端压力障碍（DESNOS）;然而，DESNOS不被视为一个独立的诊断，而被认为是涵盖PTSD的关联特征（American Psychiatric Association, 2013）。儿童和成人在遭受童年虐待后符合PTSD标准的，可能仍然无法被识别，因为PTSD在社区健康设置中被证明是被低估的诊断（de Bont et al., 2015）。

临床工作者未能识别PTSD可能由缺乏特定创伤和发展症状之间区别的定义所驱动，症状重叠与许多其他障碍包括广泛性焦虑障碍和抑郁症，以及例行询问关于虐待或忽视经历，这些经历可能使侵入性和/或回避样症状在PTSD诊断框架内可理解（Friedman, Resick, Bryant, & Brewin, 2010）。

即使临床工作者熟练识别PTSD，这也可能不足以完全涵盖许多成年人因童年人际创伤而经历的困难。研究者发现，PTSD只是在童年暴露于创伤事件后最不常见的20种障碍之一（Copeland, Keeler, Angold, & Costello, 2007）。共病性与情绪、焦虑和其他影响生物-心理-社会功能障碍更常见，随遭受创伤事件的严重性、频率和持续时间的增加而增加（Copeland et al., 2007）。临床研究人员已经提议，应审查 empirical research evidence以评估复杂创伤后应激障碍（C-PTSD）诊断，以发展有效的治疗模型（Bernardy & Friedman, 2015; Cloitre et al., 2011），并提出国际疾病分类（ICD）正考虑将C-PTSD包括在ICD-11版中（Friedman, 2014）。
C-PTSD has a greater number and type of clinically distinct symptom clusters than PTSD and these fit into one of two profiles: first, where high levels of re-experiencing, avoidance, sense of threat, affect dysregulation, negative self-concept and interpersonal problems are experienced; and second, where high levels of PTSD symptoms occur along with lower levels of stress disordered symptoms or DESNOS (Brewin et al., 2017). Studies have found significantly stronger associations between reported childhood interpersonal trauma and C-PTSD compared with PTSD including in adult survivors of childhood sexual and physical abuse (Cloitre, Garvert, Weiss, Carlson, & Bryant, 2014), institutional abuse (Knefel & Lueger-Schuster, 2013), and abduction and exploitation by military groups (S. Murphy, Elklit, Dokkedahl, & Shevlin, 2016).

Experiencing interpersonal trauma in childhood does not automatically consign survivors to a PTSD or C-PTSD diagnosis, with a recent review of the literature finding that the number of adults retaining a normal level of functioning after childhood sexual abuse was estimated to be between 10% - 53% (Domhardt, Munzer, Fegert, & Goldbeck, 2014). To further complicate the clinical picture, a meta-analytic review of studies examining the effect of trauma history on PTSD severity found that PTSD symptoms were nearly as common for people who had experienced events deemed non-traumatic compared with those defined as traumatic according to DSM criteria (Larsen & Pacella, 2016). Some studies have therefore suggested that trauma history may be more usefully regarded as a risk factor for the development of PTSD or C-PTSD rather than a requirement, in order to account for the potential influences of a range of bio-psychosocial factors that may confer vulnerability or resilience (Cloitre et al., 2014; Elklit, Hyland, & Shevlin, 2014).

Individuals are likely to seek personal, couple or family therapy where challenges consequent to childhood maltreatment are affecting their current intra- or interpersonal functioning. This section of the literature review will look at available evidence-based therapies for adults diagnosed with PTSD who have experienced interpersonal trauma in
childhood, as well as evidence-based therapies for adults with a childhood interpersonal trauma history who either do not meet criteria for the PTSD diagnosis, or exhibit comorbid conditions that may be better understood through a C-PTSD lens.

2.3.1 Therapies for adults diagnosed with Posttraumatic Stress Disorder consequent to childhood interpersonal trauma.

Systematic reviews of randomised controlled trials for the treatment of chronic PTSD identified cognitive behavioural therapy methods that included exposure (CBT) and Eye Movement Desensitisation Reprocessing (EMDR) as the psychological approaches found to be most effective for reducing the severity of clinician-assessed PTSD symptoms immediately post-treatment (Bisson et al., 2013; Cusack et al., 2016). A meta-analysis of psychological treatments for PTSD in adults who have experienced childhood abuse found that this group are under-represented in analyses of the efficacy of PTSD treatments, and that where they were included, other individual trauma-focused treatments such as Emotion-Focused Therapy with imaginal confrontation and Dialectical Behavioural Therapy for PTSD were found to have similar effect sizes to CBT and EMDR (Ehring et al., 2014). Ehring et al (ibid) additionally note that trauma-focused therapies showed larger effect sizes than non-trauma focused approaches for adult survivors of childhood trauma who have a PTSD diagnosis, even where there are high levels of symptom severity and complexity including emotion regulation difficulties and dissociation. Authors in each of the reviews cited above note that high drop-out rates, small sample sizes and methodological issues mean that results should be interpreted with caution, and that there is limited evidence to suggest benefits are maintained over time. Each of these approaches are now looked at in more detail, to examine the key effective ingredients for treatment, to identify which treatments work for different sub-groups (e.g., individuals experiencing dissociative symptoms consequent to childhood trauma experiences), and to identify gaps and limitations in existing treatments.
Exposure and Cognitive Behavioural Therapy methods (CBT). Cognitive

behavioural approaches to PTSD symptom reduction are designed to minimise intrusion, avoidance and hyper-arousal by combining re-experiencing with working through trauma-related memories and emotions, and teaching ways of managing trauma-related stressors in 12 – 16 weekly sessions (Foa & Meadows, 1997). Intervention is predicated on theory that assumes that an individual’s cognitions about a traumatic experience influence their emotional response to events that trigger traumatic memories, and that negative emotional reactions can interfere with emotional and cognitive processing of traumatic memories, which in turn leads to trauma symptomatology (Foa et al., 2005). Techniques used include systematic imaginal or in vivo exposure to traumatic memories or distressing trauma-related stimuli in order to extinguish conditioned emotional responses that may hamper emotional and cognitive processing, psycho-education about the effects of trauma, relaxation and other stress-reduction strategies in order to enable trauma processing to occur, and cognitive restructuring addressing maladaptive beliefs about the trauma and its implications (Resick & Schnicke, 1992).

CBT was found to significantly reduce PTSD symptoms in adults who had experienced childhood physical and/or sexual abuse in five studies including groups diagnosed with comorbid conditions (Chard, 2005; Dorrepaal et al., 2010; Dorrepaal et al., 2012; Lu et al., 2009; McDonagh et al., 2005), with improvements maintained at 1 year/ 6 months follow-up ($n^2 = .32-.70$). McDonagh et al (ibid) found, however that a present-centred problem solving therapy was equally effective and retained more participants. Dropout rates were much higher in CBT (33%) compared with other treatments; however these were reduced (16%) where group therapy was offered in addition to individual treatment (Chard, ibid) or as a stand-alone approach (Dorrepaaal et al., 2010; 2012 ibid). Studies were limited by small sample size (ranging from $N = 14$ to $N = 74$) meaning that study replication is warranted before results can be generalised.
*Eye Movement Desensitisation and Reprogramming (EMDR)*. EMDR is an eight-phase treatment conducted over 8-12 weekly 90-minute sessions. Phases are (1) gathering client history and treatment planning; (2) orienting and preparing the client for treatment; (3) assessing all components of the traumatic memory/memories to be targeted; (4) desensitisation of traumatic memories through the use of eye movement stimulation; (5) introducing a positive cognition identified by the client; (6) scanning the body for emotional and/or somatic responses that may indicate further unresolved traumatic memories; (7) closure; and (8) re-evaluation (Shapiro, 1989). EMDR is based on adaptive information processing theory, which postulates that eye movements and/or other forms of bilateral stimulation interrupt physiological and neurological processes that may interfere with working memory, therefore allowing connections to be made with new and more adaptive information held in other memory networks. EMDR is also theorised to elicit an orienting response, which is associated with lowering of emotional arousal, allowing traumatic memories to be processed (Shapiro & Maxfield, 2002).

Although a number of studies have established the effectiveness of EMDR for adults diagnosed with PTSD, few have examined whether EMDR may be helpful for adults with a history of childhood interpersonal trauma (Ehring et al., 2014). One study found that EMDR was effective for significantly reducing PTSD symptoms in 20 women who had experienced childhood sexual abuse compared with treatment as usual \(d = 1.36\) (Edmund, Rubin, & Wambach, 1999), with gains maintained at 18-month follow-up \(d = 1.38\) (Edmund & Rubin, 2004). Another study that compared EMDR with pharmacotherapy \(N = 88\) found that EMDR was less effective for participants who had experienced abuse in childhood compared with those with adult-onset trauma, and that neither treatment produced complete PTSD symptom reduction for adults with childhood trauma experiences (van der Kolk et al., 2007).
**Dialectical Behaviour Therapy for PTSD (DBT-PTSD).** DBT-PTSD is a cognitive behaviour therapy that integrates emotion regulation and PTSD symptom management skills such as mindfulness, distress tolerance and interpersonal effectiveness skills with cognitive and exposure-based interventions for adults with PTSD and Borderline Personality Disorder (BPD). Weekly individual and group therapies, with additional phone consultation as needed are offered over one year (Harned, Korslund, Foa, & Linehan, 2012). DBT-PTSD is based on cognitive and behavioural theories, crisis intervention theory, and dialectical theory that proposes a balance of acceptance (Western contemplative and Eastern meditative practices) and change strategies are more effective than either acceptance or change strategies alone (Becker & Zayfert, 2001). One study \((N = 74)\) found that DBT-PTSD was significantly more effective than treatment-as-usual (Hedges’ \(g = 1.60\)) at reducing PTSD symptoms in women with and without a diagnosis of BPD who had a history of childhood sexual abuse (Bohus et al., 2014). A recent uncontrolled clinical trial found that participation in DBT-PSTD resulted in large borderline and PTSD symptom reduction for 21 women suffering from PTSD and emotion regulation difficulties consequent to childhood sexual abuse experiences (Steil et al., 2018). Another study \((N = 26)\) found that adding a prolonged exposure component to DBT resulted in larger reductions in PTSD symptoms (Hedges’ \(g = 2.9\)) and intentional self-injury \((g = 1.0)\) compared with DBT alone \((g = 1.5/0.8)\) for women with a BPD diagnosis and a childhood trauma history (Harned, Korslund, & Linehan, 2014), indicating that adding exposure therapy to DBT may be critical in alleviating the interaction of emotion dysregulation and PTSD symptoms that often cause intractable difficulties. The addition of mindfulness strategies (e.g., present moment awareness) may allow a process whereby emotional arousal is reduced sufficiently that PTSD and/or BPD symptoms are less likely to be activated by interpersonal or other environmental triggers.

**Emotion-Focused Therapy for Trauma (EFTT).** EFTT is a short-term therapy (8 – 20 sessions) that uses emotional re-experiencing to support trauma memory processing.
EFTT draws on emotion and experiential theories, viewing emotions as the way trauma memories are stored and expressed when they are activated. Emotions are assumed to have an innately adaptive quality that if evoked and processed, can help change problematic emotional states and interpersonal relationships. The therapeutic relationship is viewed as a critical element of therapeutic change (Paivio & Laurent, 2001). One small study ($N = 32$) found that PTSD symptoms were significantly reduced ($d = 1.03$) for adult survivors of child abuse who received EFTT compared with a wait-list control, with gains maintained at 9-months follow-up (Paivio & Nieuwenhuis, 2001).

Individually focused therapies for adults with a PTSD diagnosis consequent to childhood interpersonal trauma are therefore most effective at reducing PTSD symptoms where a combination of skill development, emotion regulation strategies and prolonged exposure approaches are utilised. Therapies for adults with more complex problems resulting from childhood trauma experiences are now considered, where deficits in emotional, sensory, somatic, cognitive and interpersonal self-regulation may exist in addition to PTSD symptomatology (Ford & Courtois, 2009).

2.3.2 Therapies for adults meeting criteria for Complex Posttraumatic Stress Disorder (C-PTSD) consequent to childhood interpersonal trauma.

Consensus guidelines have been developed by experts to inform treatment of C-PTSD and DESNOS, which recommend a phase-oriented, multimodal, skill-focused approach in order to achieve symptom relief and improvement in functional capacities for self-regulation and strengthening of personal and interpersonal resources (Cloitre et al., 2012). Phases of treatment comprise (1) establishing safety, reducing symptoms and improving emotional, social and psychological functioning; (2) processing unresolved aspects of traumatic memories, with an emphasis on review and re-appraisal of traumatic memories so they are integrated into an adaptive representation of oneself, relationships and the world; and (3) consolidation of treatment goals in order to facilitate the transition from the end of treatment
to greater engagement with relationships, work or education, and community life. Treatment involves weekly sessions over approximately a two year period (Cloitre et al., 2011). The rationale for this approach is that prioritising improvement in day-to-day functioning needs to precede trauma-focused work, and that treatment is offered in stages at a pace the individual can manage (Cloitre et al., 2005). Systematic investigation of the optimal way to order treatment components, however, has not yet been conducted (Karatzias et al., 2018).

Therapeutic goals are achieved via a combination of intra- and inter-personal approaches (Steele, van der Hart, & Nijenhuis, 2005), and utilisation of techniques that address implicit and relational affective regulation processes as well as ‘top-down’ cognitive strategies (L. S. Greenberg, 2004; A. N. Schore, 2001). Techniques are tailored to symptoms; for example treatment for relationship difficulties may include education about the effects of trauma on relational functioning, interpersonal skills training and cognitive restructuring; whereas treatment targeted at reducing dissociative symptoms may focus psycho-education on why dissociative symptoms may develop as an adaptive response to abuse, as well as teaching emotion regulation and mindfulness skills (Cloitre et al., 2011). Randomised control trials (RCTs) of phase-oriented treatments for C-PTSD have demonstrated moderate to large effect sizes ($d = 0.7 – 1.6$) when compared to exposure or skill-based therapies (Chard, 2005; Cloitre et al., 2002). Phase-oriented treatment principles have been utilised to expand CBT, EMDR, DBT-PTSD and EFTT approaches.

**Cognitive Behavioural Therapy (CBT) for C-PTSD.** A recent study investigating the role of negative cognitions, emotion regulation strategies and attachment style in C-PTSD found that negative trauma-related cognitions were the most important factor in diagnosis, followed by attachment anxiety and emotional suppression, indicating that utilising CBT strategies to target negative thoughts and attachment representations may have an important role to play in C-PTSD treatment (Karatzias et al., 2018). An uncontrolled outcome study
(N = 34) (Jepsen, Svagaard, Thelle, McCullough, & Martinsen, 2009) embedded CBT strategies within a phased individual and group treatment approach, involving twice-daily group therapy and individual therapy 1-2 times a week over three months. Transference analysis was used to assist the development of new internal working models of relationships, interpersonal skill development, and supportive strategies strengthened internal and interpersonal resources in adult survivors of child sexual abuse who had comorbid conditions. Significant symptom reduction was reported by all participants; however results were less favourable for those with comorbid somatisation disorders (Jepsen et al., 2009). An RCT (N = 71) added a stabilising group treatment protocol to psycho-education and CBT strategies for adult female survivors of childhood physical and sexual abuse who had C-PTSD and severely comorbid conditions including depressive and anxiety disorders, substance dependence and BPD. Participants in both control and intervention conditions received stabilising treatment, and both groups showed significant reduction in C-PTSD symptoms. Although the group who had received additional psycho-education and CBT reported larger improvements, differences between the two conditions were not significant (d = 1.75/0.83) (Dorrepaal et al., 2012).

**Eye Movement Desensitisation and Reprogramming (EMDR) for C-PTSD.** EMDR practitioners suggest that EMDR may be used to support all three phases of C-PTSD treatment (Gelinas, 2003). In the stabilisation phase, EMDR uses bilateral eye movement stimulation in the service of teaching self-soothing strategies, supporting imagery of an internal safe place (Shapiro & Maxfield, 2002), and strengthening connections to functional and positive memory networks via a process referred to as Resource Development and Instillation (RDI), though this may be contra-indicated for clients with dissociative disorders (Korn & Leeds, 2002). EMDR is combined with additional strategies when working with C-PTSD versus single-incident trauma, whereby the clinician alternates ‘cognitive interweaves’ with EMDR in order to address trauma-related dysfunctional beliefs about the
self related to responsibility, safety and choice that may be resistant to change (Shapiro & Maxfield, 2002). Further alterations of EMDR in phase two include embedding strategies that create more structure and pace the intensity of trauma work for dissociative patients (Twombly, 2000), and EMDR may facilitate phase three work by using RDI as a ‘future positive template’ to strengthen inner resources needed to achieve life goals and move into new areas of coping and competence (Gelinas, 2003). Case studies have reported large improvements after EMDR treatment for adult survivors of child abuse with C-PTSD and comorbid conditions (Bongaerts, Van Minnen, & de Jongh, 2017; Korn & Leeds, 2002); however RCTs have not established efficacy for this group (Korn, 2009). There is some evidence that EMDR may be less helpful for individuals experiencing dissociation compared with hyper-arousal, avoidance or intrusive symptoms (Bae, Kim, & Park, 2016), and may increase risk of dysregulation for those who have C-PTSD symptoms (Corrigan & Hull, 2015).

**Dialectical Behaviour Therapy (DBT) for C-PTSD.** As described earlier, DBT has been modified to address PTSD, and uses a phase-based approach to integrate PTSD treatment. Phases are (1) stabilising life-threatening behaviours and other types of serious dysregulation; (2) integrating a prolonged exposure component to allow for direct targeting of traumatic memories while using DBT skills training to address concurrent issues; and (3) using DBT to address problems that interfere with achieving life goals (Harned, Gallop, & Valenstein-Mah, 2016). Studies examining the effectiveness of DBT-PTSD (summarised in the previous section) treated PTSD symptoms in individuals who had experiences of interpersonal trauma in childhood; however no studies were found that examined whether DBT-PTSD may be effective for treating C-PTSD where PTSD diagnostic criteria were not met. It has been suggested that people who drop out of CBT and DBT-PTSD treatments are primarily those with unrecognised C-PTSD symptoms, for whom Exposure Therapy may be dysregulating and cognitive or behavioural strategies that assume volitional control over
dissociative symptoms are ineffective; however this hypothesis has not been tested (Corrigan & Hull, 2015).

**Skills Training in Affective and Interpersonal Regulation plus Modified Prolonged Exposure (STAIR-MPE).** STAIR-MPE was developed to specifically address C-PTSD related to child abuse, and targets emotion regulation and interpersonal difficulties in addition to PTSD symptoms (Levitt & Cloitre, 2005). STAIR-MPE is a two-phase treatment: phase one consists of eight sessions that combine DBT skills training and CBT; and phase two comprises eight sessions of modified prolonged imaginal exposure. Phase one techniques include psycho-education on the impact of child abuse on emotion regulation and relationships, identification and labelling of feelings, emotion regulation, distress tolerance and assertiveness skills, alternative interpersonal schemas, and interpersonal flexibility (ibid). Two RCTs (N = 58/104) found that after completing STAIR-MPE, participants had significantly less affect dysregulation (d = 1.32/1.27), interpersonal skills deficits (d = 0.96/0.75) and PTSD symptoms (d = 1.3/1.51) compared with those who participated in either supportive counselling followed by Exposure Therapy, or skills training and supportive counselling (Cloitre et al., 2002; Cloitre et al., 2010).

**Emotion-Focused Therapy (EFTT) for C-PTSD.** The theorised mechanisms of change underpinning EFTT have been considered from a complex trauma perspective, where techniques such as ‘emotional transformation’ may allow an adult survivor of childhood sexual abuse, for example, to access and express anger and place responsibility onto the perpetrator rather than the self (Mlotek & Paivio, 2017). An RCT offered two versions of EFTT to 45 adult survivors of childhood maltreatment where a PTSD diagnosis was not required for study inclusion (Paivio, Jarry, Chagigiorgis, Hall, & Ralston, 2010). Twenty participants received EFTT with imaginal confrontation (IC), and 25 participants received a version of EFTT where empathic exploration (EE) was used to process traumatic material. Participants in the IC condition reported significantly reduced posttraumatic stress symptoms,
emotional distress, personal and interpersonal problems, and increased abuse resolution compared with those in the EE condition ($d = 1.59$ IC / 1.29 EE) with benefits maintained at 12 months follow-up; however there was a lower drop-out rate in the EE group (20% IC / 7% EE) in line with previously reported studies measuring other forms of exposure-based treatments i.e., CBT. Participants with more severe trauma symptomatology showed smaller treatment gains, especially in the EE condition.

**Treatment for dissociative disorders.** The link between exposure to childhood maltreatment and the development of dissociative disorders is well established in the literature; however dissociation is often overlooked and therefore not treated, with detrimental results for treatment engagement, retention and effectiveness (Bailey & Brand, 2017). A review of empirical reports of treatment for dissociative disorders in adults exposed to childhood interpersonal trauma found that phase-based trauma therapy improves symptoms and functioning where dissociative symptoms are specifically targeted, particularly the use of stabilisation strategies to teach and model grounding and containment skills within a relational and therapeutic context (B. L. Brand, Loewenstein, & Spiegel, 2014). A recent uncontrolled study found that specialised phased, dissociation-focused trauma treatment resulted in fewer stressors, less re-victimisation, fewer hospitalisations and higher global functioning in 131 patients still in treatment at 6-year follow-up, based on their clinician’s report (Myrick et al., 2017). Patients with dissociative symptoms are often excluded from PTSD and C-PTSD treatment studies due to the complexity of their issues, and a need for further treatment evaluation research has been identified (Bailey & Brand ibid).

**Treatments for depression, substance use disorders, eating disorders and Borderline Personality Disorder for adults who have experienced childhood interpersonal trauma.** A history of child maltreatment is significantly associated with recurrent and chronic depression, substance use, eating disorders and BPD which often are co-diagnosed with
PTSD (R. T. Liu, 2017; Messman-Moore & Bhuptani, 2017). Existing treatments have been found to be less effective for individuals with an interpersonal trauma history, resulting in either non-responsiveness to treatment or early relapse/recurrence (Bockting, Hollon, Jarrett, Kuyken, & Dobson, 2015). Recommendations include addressing underlying emotion dysregulation problems within a C-PTSD phased treatment approach (Messman-Moore & Bhuptani ibid), conducting further research in order to better understand bio-psychosocial factors that may mediate or moderate risk or resilience, in order to better inform assessment and develop more individualised treatment (R. T. Liu ibid), and integration of ‘bottom-up’ approaches that directly address subcortical processes underpinning posttraumatic symptoms (Blom et al., 2014; Corrigan & Hull, 2015).

‘Bottom-up’ approaches. Many therapies work from a ‘top-down’ model where thoughts are used to change feelings, behaviours and experiences, and are reliant on the neocortex to manage and alter the inner and more primitive parts of the brain. They require the ability to analyse, narrate and verbally process thoughts and feelings, a type of process not often possible for individuals with unresolved relational trauma experiences. ‘Bottom up’ therapies work directly with somatic and emotional processes in order to target unresolved sensory, somatic and nonverbal aspects of unresolved trauma experiences (A. Taylor, Goehler, Galper, Innes, & Bourguignon, 2010). ‘Bottom up’ approaches are endorsed by leading experts in the complex trauma field (e.g., Bessel van der Kolk, Alan Schore) and supported by neurobiological findings; however there is little evidence to support their efficacy (Corrigan & Hull, 2015). Existing studies are exploratory in nature, many of which utilise case study and small sample uncontrolled research designs.

Sensorimotor Psychotherapy (SMP) is a phase one stabilisation treatment within the C-PTSD treatment guidelines (Cloitre et al., 2011). SMP is a body-oriented therapy based on attachment theory, using techniques drawn from CBT and psychodynamic psychotherapy to assist patients to (1) become aware of automatic maladaptive action tendencies, (2) learn to
inhibit initial impulses, (3) experience with alternative actions in order to complete the frozen actions that were unable to be utilised during the trauma experience, and (4) practise ways to take alternative and effective actions (Ogden, Minton, & Pain, 2006). Treatment integrates ‘top-down’ strategies including psycho-education about trauma, mindfulness and concentration practice with ‘bottom-up’ therapies including development of somatic resources for regulating autonomic arousal. One uncontrolled study found that twenty severely and chronically ill patients diagnosed with C-PTSD and/or DESNOS, who participated in a 12-week SMP group program scored significant changes post-treatment (effect sizes not reported) on measures of PTSD symptoms, depression, physical health, and work and social functioning (Gene-Cos, Fisher, Ogden, & Cantrel, 2016). Another uncontrolled study found that eight women with a history of interpersonal trauma, who participated in 20 weekly sessions of an SMP group intervention showed decreased levels of overall PTSD symptoms, increased levels of mindfulness, and increased social connectedness at one month post-intervention (effect sizes not reported) (R. A. Murphy, 2016). Findings suggest that a focus on ‘bottom-up’ strategies as part of phase one C-PTSD treatment may equip adults with an interpersonal trauma history with skills that assist them to experience and maintain a feeling of stability, allowing them to progress to phase two of C-PTSD treatment, as well as improving their sense of intra and interpersonal safety.

Sensory Integration provides acoustic and visual stimulation in order to strengthen neurological integration between upper cortical areas and the brain stem in individuals diagnosed with developmental or neurological conditions that create sensory disorders e.g Autism, learning disabilities (Porges et al., 2014). The Sensory Learning Program (SLP) is a manualised treatment application of this approach, that comprises the use of gated music (recorded music that progressively introduces sounds alternating high and low frequencies, and louder or softer volumes) to normalise hearing across the auditory spectrum, and coloured light to retrain the eye muscles along the optic nerve pathway (Bolles, 2004). A
pilot study utilising a randomised controlled design tested SLP in combination with psychotherapy with ten adults diagnosed with DESNOS, and found that those \((n = 5)\) who received a 30 day treatment comprising auditory, visual and vestibular training reported significant improvements in self-reported self-perception, affect regulation and alterations in meaning \((d = 3.7)\) from the Structured Interview for Disorders of Extreme Stress, compared with a wait-list condition \((n = 5)\). Clinician-assessed measures of visual and auditory sensory patterning were administered pre and post intervention. Intervention participants improved the width of their right eye visual fields compared with the control condition (effect size not reported). No significant differences were found in auditory variable scores (Kaiser, Gillette, & Spinazzola, 2010). This study was limited in a number of ways, including small sample size, and methodological problems including lack of equivalence between treatment and wait-list groups at baseline, which was not controlled for in statistical analyses. Strengths of the study include its attention to sensory difficulties that are often neglected in treatment for individuals who have experienced childhood abuse that has altered sensory processing.

Yoga therapy is claimed to develop physiological self-regulation that may alleviate emotional and psychological distress through an integration of top-down and bottom-up processes that facilitate bidirectional communication between the mind and the body (M. B. Sullivan et al., 2018). A recent meta-review concluded that yoga therapy is a promising adjunctive treatment for PTSD, anxiety and depression, though existing research is hampered by a lack of methodological rigour and lack of specificity regarding definition of trauma (Macy, Jones, Graham, & Roach, 2015). Reviews of studies reported that yoga breathing, physical postures and meditation lowered PTSD and Generalised Anxiety Disorder symptoms in clinical groups including survivors of child abuse and interpersonal violence (Longacre, Silver-Highfield, Lama, & Grodin, 2012; Telles, Singh, & Balkrishna, 2012), and that yoga therapy may be used in combination with exposure therapy, mindfulness, medication or psychotherapy to achieve greater symptom reduction than those therapies alone.
(daSilva, Ravindran, & Ravindran, 2009; Telles et al., 2012). ‘Bottom up’ approaches may also be of benefit to parents with an interpersonal trauma history, in order to assist them to regulate physiological processes that may drive reactivity and non-responsiveness in the parent-child relationship.

Phase-oriented approaches that incorporate specific attention to emotion regulation and interpersonal skills utilising a combination of bottom-up with top-down strategies have demonstrated efficacy. More studies utilising larger sample sizes and randomised control designs are needed to further test the efficacy of bottom-up approaches, and to discover what may be helpful for individuals experiencing dissociative symptoms. The next section looks at therapies that are offered to adults with an interpersonal trauma history who are experiencing difficulties in their current relationships, in order to discover what has been found to be effective, and where existing approaches may be limited.

2.3.3 Relational and systemic therapies for adults who have experienced childhood interpersonal trauma.

Trauma treatment tends to be individually focussed; work that addresses family relationships and functioning is less commonly part of evidence-based intervention. Adults with a history of childhood interpersonal trauma may seek assistance with relationship problems either individually, or with a partner or family members in order to address current relationship challenges. Individual or conjoint relationship therapies have not been specifically developed to address the interpersonal challenges faced by this group; instead, evidence-based approaches have been modified to incorporate a trauma lens (Lebow, Chambers, Christensen, & Johnson, 2011). Evidence-based relational therapies utilise cognitive, behavioural and emotion-focussed approaches as outlined in previous sections in order to address interpersonal problems.

Dyadic and family therapies are additionally informed by family systems theory, which suggests that individuals cannot be understood in isolation from one another, but rather
as a part of their relationship or family group (Brown, 1999). Couples, parent-child dyads and families are therefore regarded as self-organising, dynamic and reciprocal systems, where the system is viewed as a single entity that may be experiencing maladaptive interpersonal states such as heightened conflict or negative emotional interactions that require therapeutic intervention (von Bertalanffy, 1968). Treatment aims to interrupt unhelpful interaction patterns via strategies such as teaching skills in managing and responding to negative emotions, in order to render dyad/family systems more sensitive to change toward more adaptive interactive states (Granic, Hollenstein, Dishion, & Patterson, 2003). Systemic therapies have been found to be effective, either alone or as part of multi-modal approaches, for adults experiencing relationship problems, partner or family violence, anxiety and mood disorders, substance use problems, Schizophrenia, and adjustment to chronic illness (Batzer, Berg, Godinet, & Stotzer, 2018; A. Carr, 2014; Wiebe & Johnson, 2016), though many studies are hampered by small sample size and varying data quality (Littell, Popa, & Forsythe, 2005). Intensive Multisystemic Therapy, Multidimensional Therapy and Functional Family Therapy approaches involving one - five sessions per week over 3-6 months have demonstrated effectiveness to the extent that they are now regarded as a preferred treatment for families where adolescents have psychiatric diagnoses (including PTSD) and/or behavioural problems, including in the context of parental maltreatment (Eeren, Goosens, Scholte, Busschbach, & van der Rijken, 2018; Liddle, 2016; Sexton & Datchi, 2014; Swenson, Schaeffer, Henggeler, Faldowski, & Mayhew, 2010). For the purposes of this review, although the efficacy of systemic therapies has been established for a number of clinical groups, many of whom may include parents with a history of childhood interpersonal trauma, only studies which have assessed parents’ trauma history, and addressed parents’ trauma-related difficulties as part of therapeutic intervention are considered.

**Interpersonal Therapy (IPT).** IPT is an individual therapy, but is considered a relational approach in that it focuses on improving relational functioning that may precipitate
and perpetuate depressive symptoms, driven by unresolved grief, interpersonal (or role) disputes, role transitions, or interpersonal sensitivities (Robertson, Rushton, & Wurm, 2008). IPT may therefore offer an alternative to exposure therapy when working with survivors of interpersonal trauma. IPT comprises a 12-16 session structured intervention based on attachment theory and interpersonal theory, which views maladaptive meta-communication patterns as targets for change for individuals who have experienced early adversity and are struggling with depression and interpersonal conflict. Mechanisms of change are hypothesised to be enhancement of social support, decreasing interpersonal stress, facilitating emotional processing, and improving interpersonal skills (Lipsitz & Markowitz, 2013).

A meta-analysis of studies evaluating IPT has found it is helpful for adolescents and adults experiencing a range of mental health problems, including depression, anxiety and eating disorders, with additional benefits found for preventing relapse of depressive disorders (Cuijpers, Donker, Weissman, Ravitz, & Cristea, 2016). An RCT comparing IPT with prolonged exposure and relaxation therapy (control condition) for adults with chronic PTSD and comorbid Major Depressive Disorder found that IPT was nearly as effective as exposure therapy in reducing PTSD as measured by the clinician-administered PTSD Scale and PTSD Scale Self-Report ($d = 1.69/1.88$) and depressive symptoms as measured by the Hamilton Depression Rating Scale ($d = 0.62/1.07$), and also had lower attrition rates (15% /29%). Findings suggest that effective PTSD treatment may not require cognitive-behavioural exposure to traumatic memories, and that focusing on relationships may reduce symptoms (Markowitz et al., 2015). No studies were found that examined whether IPT may be effective for adults with a history of childhood interpersonal trauma. IPT has been found to be less effective for individuals with more entrenched insecure attachment styles, who do not have the ability to create a coherent narrative about their interpersonal system and interactions, and who do not have a good social support network - challenges often experienced as a consequence of interpersonal trauma (Robertson et al., 2008). However an approach focusing
on improving relationship functioning in order to reduce symptoms may enhance attachment security and reduce relational conflict for some adults who experience interpersonal difficulties consequent to childhood maltreatment. For those with more severe interpersonal difficulties, methods that are less reliant on ‘top-down’ cognitive processing may be required.

**Cognitive-Behavioural Couple Therapy (CBCT).** CBCT is an evidence-based approach for treatment of relationship problems, theoretically grounded in social learning, social exchange and ecological theories that view individual behaviour as both influencing and influenced by multiple systems including the couple relationship. The method focuses on exchanges of positive and negative behaviours, and communication skills that influence interaction processes (Epstein & Zheng, 2017). CBCT has been modified for couples where one partner has a diagnosis of PTSD. One RCT randomised couples to either CBCT \((n = 40\) couples) or a wait list condition \((n = 80\) individuals) (Monson et al., 2012). Significant results were found for the treatment group as measured by reduction in PTSD symptom severity on the clinician-administered PTSD Scale and the PTSD Checklist (patient-rated \(g = 1.61\); partner-rated \(g = 1.02\); clinician-rated \(g = 1.82\)) and intimate relationship satisfaction as measured by the Dyadic Adjustment Scale (patient-rated \(g = 0.64\); partner-rated \(g = 0.15\)). Participants were war veterans and their partners; three participants reported a history of childhood sexual abuse. A three phase treatment was delivered where (1) psycho-education was given about the reciprocal influences of PTSD and relationship functioning, (2) generalised avoidance of emotion and intimacy was addressed by assisting the trauma survivor to approach these with his/her partner, and (3) problem-solving and communication skills were taught. No studies were found that examined whether CBCT may be helpful for adults with C-PTSD and relationship difficulties subsequent to childhood interpersonal trauma. It is also not known if this approach may be usefully adapted to assist parent-child dyads, where a parent has experienced childhood interpersonal trauma and the dyad are experiencing relationship difficulties.
**Emotion-Focused Therapy for Couples (EFT-C).** EFT-C is an experiential and systemic therapy that emphasises the role of affect in therapeutic change. Phases of therapy are (1) de-escalating destructive interactional patterns, (2) facilitating each partner’s expression of and response to each other’s attachment needs, and (3) consolidating adaptive ways of communicating (A. Carr, 2014). EFT-C has been found to be effective for heterosexual couples where the female partner has a history of severe childhood abuse. An RCT was conducted where twenty-four couples were randomly assigned to 20 sessions of EFT or a 24 weeks waitlist control. Couples who received EFT-C reported a statistically and clinically significant reduction in relationship distress as measured by the Dyadic Adjustment Scale ($d = 0.62$), and women in the treatment condition also reported reduced symptoms of dissociation, interpersonal sensitivity and phobic avoidance as measured by the Trauma Symptom Inventory and the Dissociative Experiences Scale, though these were not statistically significant (Dalton, Greenman, Johnson, & Classen, 2013). EFT-C was modified to address the trauma survivor’s challenges with regulating affect within sessions, in particular emotional flooding, emotional numbing, dissociation, constricted affect and affect dysregulation, hypervigilance directed at their partner, and shame around sexuality (MacIntosh & Johnson, 2008). While it is not yet known if EFT-C may be usefully adapted to assist parent-child dyads, or parents with a history of childhood interpersonal trauma, parents may benefit from therapy that helps them to regulate overwhelming affect that may be directed toward their adolescent child.

Parent-child relationships are the first context in which young people learn how to manage interpersonal conflict and regulate negative emotions when with others. Parent-adolescent dyads may resemble distressed marital dyads in that they can become caught in reciprocal cycles of negative expression of emotion that become resistant to change or to conflict resolution (Moed et al., 2014). Work with parent-adolescent dyads may therefore draw from techniques used in couples therapy that target relationship quality and functioning
Parents with a history of interpersonal trauma may benefit from psychoeducation about the effects of trauma on relationship functioning, assistance to regulate overwhelming affect that may be directed toward their adolescent, help to increase emotional connection to their adolescent via interventions that encourage approach rather than avoidance of their adolescent’s emotion, and learning communication strategies.

Although effect sizes were smaller than therapies addressing trauma symptoms directly, therapies addressing relational functioning have reduced PTSD symptoms and relational distress without direct attention to traumatic memories. Lower dropout rates would suggest that therapies with a relational (including parenting) focus may be also more manageable for individuals with a history of interpersonal trauma. This review now considers therapies that are offered to parents with a history of interpersonal trauma, in order to discover what approaches may be effective for this population.

2.3.4 Therapies for parents with an interpersonal trauma history and their children.

Therapies for parents with a history of childhood trauma have tended to focus on individual treatment without considering problems in their relationships with their children (Greenman & Johnson, 2012); however parenting interventions or dyadic/family therapy incorporating CBT or EMDR have more recently been included as part of an integrated approach for parents diagnosed with PTSD (Landy, Pukay-Martin, Vorstenbosch, Torbit, & Monson, 2015; Wesselmann et al., 2012; Zaccagnino & Cussino, 2013). Mindfulness and mentalisation-based treatments have also been modified to meet the needs of parents with PTSD and their families, with the proviso that these approaches require children to be verbally competent to participate in the process (at least 7 years of age) (Asen & Fonagy, 2012b; Casselman & Pemberton, 2014). Therapies developed for traumatised children routinely include parents in treatment, and may address parental trauma where it is impacting on the parent-child relationship in the context of dyadic or family work, e.g., Theraplay or
Lieberman’s Parent-Child Psychotherapy (Jernberg & Booth, 2001; Lieberman et al., 2005). Goals for working with families include assisting a parent to inhibit dysregulated responses (Nijssens et al., 2012; Skowron, Benjamin, Cipriano-Essel, Pincus, & Van Ryzin, 2013), increasing sensitive and emotionally supportive responses to their child (Valentino, 2017), helping family members to manage bidirectional triggering that may activate and maintain negative escalating cycles of communication (Figley & Figley, 2009; Jenks, 2012), and learning new interaction patterns that foster secure attachment and resilience (Diamond, Siqueland, & Diamond, 2003; Saltzman et al., 2011). However, evidence for effectiveness of systemic or parenting inventions that address difficulties faced by parents with an interpersonal trauma history is limited, and a need for further high quality trials has been identified (Evans, Turner, & Trotter, 2012; Maliken & Katz, 2013). A critical review of the research about challenges and treatment for parents who have been diagnosed with PTSD recommends dyadic and systemic approaches grounded in attachment, mentalising, relational and transactional theories, that highlight the restoration of safety, re-establishment of secure attachment relationships and regulation of arousal in response to the unique trauma triggers evoked by parent-child interaction (van Ee et al., 2015). These recommendations may also apply for parents with an interpersonal trauma history who do not meet PTSD criteria. Achieving these goals may be reliant on working directly with nonverbal as well as verbal communication processes (L. S. Greenberg, 2008; J. Schore & Schore, 2007).

**Attachment-based parenting and family interventions.** There are only a handful of trials of attachment parenting and family therapy interventions for families where parents have experienced childhood interpersonal trauma, including utilisation of small case study designs. One case study utilised CBT and EMDR treatment to assist a parent to resolve childhood trauma by addressing her internal working model of attachment, and found positive changes in her relationship with her child and her mental representation of caregiving as measured by the Parent Development Interview (Zaccagnino & Cussino, 2013).
Child-Parent Psychotherapy (Lieberman & Van Horn, 2005) is an intervention that integrates psychodynamic, attachment, trauma, cognitive-behavioural and social learning theories to help mothers and their preschool children restore their relationship, and improve children’s wellbeing after the experience of family violence. Both nonverbal and verbal strategies are used; including the use of positive touch to re-establish trust in bodily sensations, and utilisation of play to integrate children’s affect with their narrative about traumatic experiences. Mothers’ attachment and interpersonal trauma history is obtained in order to determine what assistance they may need to respond sensitively to their child in treatment (Lieberman et al., 2005). One RCT (N = 68) found that post-intervention children had significantly reduced anxiety, avoidance, resistance and anger and higher partnership with their mother compared with controls (effect sizes not reported), as measured by the Life Event Inventory, Maternal Attitude Scale, and the Home Observation for Measurement of the Environment clinician-observed assessment (Lieberman, Weston, & Pawl, 1991). A second RCT (N = 76) found that children had reduced symptoms of posttraumatic stress (as measured by the Structured Clinical Interview for DC:0-3; d = 0.63) and behaviour problems (measured by the Child Behaviour Checklist; d = 0.24) post-intervention compared with controls (Lieberman et al., 2005). Although not the target of treatment, post-intervention parents also reported lower symptoms of PTSD as measured by the Symptom Checklist 90 (d = 0.37) and the clinician-administered PTSD Scale Interview (d = 0.41) after participation in the 2005 study, suggesting that working on parenting and parent-child relationships may result in positive outcomes for parents with an interpersonal trauma history as well as their children.

Mom Power (Muzik et al., 2015) is a multifamily group 13 session parenting intervention for at risk mothers with interpersonal trauma histories and mental health diagnoses including depression or anxiety, and their young children 0-5 years. The intervention comprises attachment-based parenting education, self-care including emotion
regulation, stress reduction and mindfulness strategies, teaching mothers skills that support the development of children’s social and emotional competence, enhancing social support networks, and connection to community resources. An RCT \((N = 122)\) found improvements in mental health (Post-Partum Depression Scale \(d = 0.23\)) and reductions in caregiving helplessness (Caregiving Helplessness Questionnaire \(d = 0.29\)) for high risk mothers with a history of interpersonal trauma, mental health problems and who were experiencing poverty in the intervention condition compared with controls (Rosenblum, Muzik, et al., 2017). A second RCT \((N = 75)\) found that high risk mothers’ mentalising or reflective capacity, as measured by the Working Model of the Child Interview, was significantly increased for mothers who had participated in Mom Power \((d = 0.29)\) compared with controls (Rosenblum, Lawler, et al., 2017). Further research may explore whether an attachment-based approach incorporating psycho-education and skill development may also be helpful for parents with a history of interpersonal trauma and their children older than 5 years, including adolescents.

Diamond’s Attachment Based Family Therapy (ABFT) is a brief treatment for depressed adolescents and their families, that helps adolescents identify and discuss family conflicts that have ruptured relationships and damaged trust, and assists parents to acknowledge and repair these (Diamond et al., 2003). Treatment focuses on relational reframing in order to shift the responsibility for change to the family as a whole rather than the adolescent, alliance building separately with parent and adolescent, reattachment, and promoting the adolescent’s competency. A parent’s attachment history (which may include experiences of relational trauma) is assessed and addressed in order to support the parent to become more empathic toward their own attachment experiences so they may in turn empathise with their adolescent’s grievances (Diamond et al., 2014). ABFT has developed an initial evidence base; with one study \((N = 66)\) showing it is more effective than controls or standard treatments for reducing adolescent self-reported as well as clinician-rated suicidal ideation \((d = 0.95/0.64)\) (Diamond, Wintersteener, Brown, Diamond, & Gallop, 2010). A
further study ($N = 32$) found that an adolescent’s sexual trauma history did not moderate treatment effects ($d = 0.76/0.66$) (Diamond, Gillam, Creed, & Gallop, 2012). The theorised mechanisms of change draw parallels with those of trauma recovery (Diamond et al., 2003), and therefore may have relevance to work with parents with a history of interpersonal trauma and their adolescent children.

Theraplay is a dyadic and group therapy that assists parents and their children (0-18 years) to improve their relationship through attachment-based play strategies. Strategies are predominantly nonverbal and utilise the safe use of touch to support parents in providing optimal experiences of structure, engagement, nurturing and developmentally appropriate challenges for their child (Jernberg & Booth, 2001). Theraplay has been rated by the Substance Abuse and Mental Health Services Administration as an effective evidence-based treatment for children with internalising problems, and as a promising treatment for children with Autism Spectrum Disorder (SAMHSA, 2018). Although not originally developed as a trauma therapy, a modified version of Theraplay has been developed for children who have experienced interpersonal trauma and their parents or caregivers (Booth & Jernberg, 2010). Modifications include directly assessing and addressing parents’ interpersonal trauma history in order to support parents in managing their reactions to their traumatised child (Tucker & Smith-Adcock, 2017). Studies utilising case study designs have been conducted to examine whether Theraplay may be effective as a treatment for traumatised families. One case study found that five mothers and their preschool children who had experienced family violence reported increased parenting self-efficacy and positive maternal identity, self-acceptance, and positive perceptions of their child as measured by the Parenting Stress Index Short Form and the Tool of Parenting Self-Efficacy after attending a group Theraplay intervention, with gains maintained at 3-month follow-up (Cort & Rowley, 2015). An uncontrolled study found that 15 children (2-13 years) who had experienced abuse or neglect and their caregivers showed improvements in the child’s behaviour and parent-child interaction, measured by the Child
Behaviour Checklist and the associated Teacher Report Form, and the Marschak Interaction Method (Theraplay observational assessment tool) (Bennett, Shiner, & Ryan, 2006). Although efficacy has not been established for parent-child dyads who have experienced interpersonal trauma, the initial success of Theraplay with traumatised populations suggests that the use of nonverbal and experiential ‘bottom-up’ methods may assist parents and children of all ages to enhance their attachment bond and experience joyful re-engagement with each other after relational trauma experiences.

*Mentalising approaches to parenting and family therapy.* Mentalisation is considered to be an overarching framework to enhance family and parenting interventions, requiring the clinician to ask questions and deliver interventions that model and encourage management of arousal, openness to discovering new things about other family members, acceptance of others’ subjective experiences, and perspective-taking capacity (Asen & Fonagy, 2012b; Nijssens et al., 2012). Increasing mentalisation in family systems is considered particularly important when working to reduce the ‘mindlessness’ of family violence and the intergenerational transmission of trauma (Asen & Fonagy, 2017a). Techniques including the use of audio-visual feedback with the sound turned down in order to focus explicitly on nonverbal components of interactions are considered vital in helping parents to accurately link observed behaviours with inferences about their children’s internal states (Asen & Fonagy, 2017b). Although studies examining the effectiveness of Mentalisation-Based Therapy for Families (MBT-F) as a stand-alone treatment have not yet been undertaken (Target, 2017), one RCT (N = 35) found that including MBT-F with individual Mentalisation-Based Treatment (MBT) reduced self-harming behaviour in suicidal adolescents (d = 0.46) (Assarnow, Berk, Hughes, & Anderson, 2015).

Although many studies have demonstrated that where mothers are able to mentalise about their past childhood trauma experiences, they are less likely to abuse their own children (Camolrano, 2017), only one study was found that included information about parents’
childhood trauma experiences when examining whether participation in MBT improves parents’ reflective functioning. The study found that in a sample of alcohol-abusing mothers ($N = 34$) who participated in MBT, post-intervention mothers with an interpersonal trauma history reported lower reflective functioning than post-intervention mothers who did not report childhood maltreatment (Pajulo et al., 2012). It is likely that other RCTs examining the effectiveness of MBT for parents have included parents with a childhood trauma history; however this information has not been reported in published outcomes. The effectiveness of MBT in improving reflective functioning for parents with an interpersonal trauma history has therefore not been established. Further research may examine whether MBT is helpful for this group, or whether approaches that specifically address challenges related to relational trauma experiences may improve reflective functioning.

Therapies that integrate top-down with bottom-up approaches have shown they can be effective in improving parent-child relationships and reducing parents’ and children’s mental health symptoms consequent to interpersonal trauma experiences. It is not yet known whether the inclusion of bottom-up approaches may assist parents with a trauma history to manage physiological and emotional arousal in order to better mentalise about their child’s experiences, and to accurately read their child’s nonverbal communication that signals their intentions and emotions.

A substantial part of relationships, whether well functioning or conflictual, involves communication, which may convey attachment status and capacity to mentalise. This communication is not always verbal, with much conveyed through nonverbal processes. From early in life nonverbal processes are the predominant way in which relationships occur, emotions are shared and security of attachment is either strengthened or compromised (Schachner, Shaver, & Mikulincer, 2005). Nonverbal communication may be thought of as a ‘musical’ process where rhythm, pitch, tone and volume of the voice are used to express recognition and sharing of emotions (Stern et al., 1998). This process has also been described
as ‘communicative musicality’, defined as a “wordless emotional and motivational narrative that sits beneath a conversation” (Malloch & Trevarthen, 2009, p. 5). Understanding music and its benefits in therapeutic work may also provide useful insight into what processes can shift underlying subcortical mechanisms that may drive and maintain relational difficulties. The following section examines the literature on what is known about the way music affects communicative and other processes that may be disrupted consequent to trauma exposure, in order to determine its usefulness as a medium to intervene therapeutically with parents who have a history of interpersonal trauma and their adolescent.

2.4 Effects of Music on Biopsychosocial Processes, Health and Parent-Adolescent Relationships

Music is used by parents in all cultures to comfort children, and to engage them in positive and playful ways of relating (Hallam, 2010; Nakata & Trehub, 2004). Music invokes emotion and enhances the way memories are encoded and later retrieved, which may help learning and consolidation of social interaction rules (Ferreri, Aucouturier, Muthalib, Bigand, & Bugaiska, 2013; Juslin & Vastfjall, 2008; Pasiali, 2014). Music both activates and deactivates amygdala activity (Koelsch, Siebel, & Fritz, 2010), and modifies heart, respiration and perspiration rates to assist relaxation and stress reduction (Chanda & Levitin, 2013). ‘Call and response’ chanting and participation in rhythmic activities may stimulate patterned, repetitive neural brainstem activity necessary for restoration of normal brain functioning (Thaut, 2008) and reawaken feelings of pleasure and engagement dulled by prolonged trauma exposure (Koelsch, 2009; Swaminathan & Schellenberg, 2015; van der Kolk, 2009). A mother’s voice has been found to be as effective as her physical presence for production of oxytocin in children, suggesting that vocalising is as important as touch for physiological regulation and social connectedness (Seltzer, Ziegler, & Pollack, 2010). Research suggests that music can regulate automatic breathing, sinus arrhythmia, and movement (Fancourt et al., 2014; Okada et al., 2009; Thaut, 2015), all of which may be
dysregulated consequent to trauma (Blanaru et al., 2012; Osborne, 2012). Music using sound frequencies within the human voice range may engage neural systems that cue a sense of safety, switching on the ‘social engagement’ system of which the caregiving system is a part (Porges, 2011).

The function of music is varied and is important to consider when looking at individuals with a history of interpersonal trauma who are experiencing emotional, attentional, perceptual and relational difficulties, and mental and physical health problems. The capacity of music to affect bio-psychosocial functioning may provide an additional way of understanding these difficulties, as well as offering possibilities for intervention. Music listening and participation may be used as self-help, or utilised therapeutically by trained music therapists in order to support a range of health and wellbeing outcomes (AMTA, 2018).

2.4.1 Music and psychosocial processes.

The benefits of music in enhancing psychosocial processes and development are well documented in the literature. Research has found that listening to music may induce positive emotions in otherwise stressful contexts (Menon & Levitin, 2005); musical skills training improves cognitive functioning across the lifespan (Jancke, 2009; Miendlarzewska & Trost, 2014); and participating in group music-making increases pro-social skills of cooperation, nonverbal communication, social cognition and cohesion between group members (Kokal, Engel, Kirschner, & Keysers, 2011).

Music is extensively used by children and young people not just to connect with emotions, but to express and communicate emotional states to others (Hallam, 2010). Studies have found that adolescent musical behaviour may be an indicator of their social and emotional communication abilities (Saarikallio, Vuoskoski, & Luck, 2014), and that adolescents’ music listening preferences can indicate risk as well as protective factors for the development of internalising and externalising problems (Miranda, 2013). Music may be
recruited as a tool to focus attention, alter perceptions, attributions or states of consciousness, and facilitate social engagement (Bravo et al., 2017; Croom, 2014; Fachner, 2007; Sandler et al., 2017; Thaut & Gardiner, 2014), and may therefore be considered a resource for individuals who have challenges with emotion regulation, problems with attention and consciousness, distorted perceptions and attributions, and interpersonal problems consequent to childhood interpersonal trauma. It may also be utilised as a therapeutic tool that both engages young people, and also accesses aspects of their functioning that may be more difficult to reach using verbal approaches.

**Music and emotion regulation.** Music may support emotion regulation where it does not violate or delay what the listener expects it will do, stimulates recall of pleasant memories and associated positive emotions, or is melodically, harmonically and rhythmically predictable and repetitive (Juslin & Vastfjall, 2008). A number of researchers have found that music has the capacity to arouse and intensify specific feelings, assist with evaluation and acceptance of negative emotions, and induce feelings that support coping and enhance a sense of control (Miranda, 2013; Rentfrow, 2012; Saarikallio, 2006; Saarikallio et al., 2014; Thoma, Scholz, Ehlert, & Nater, 2012). Where music is at a consistently moderate tempo, the listener may deliberately slow or quicken the pace and/or alter the depth of their breathing to align with the beat of the music, enabling them to shift physiological states that accompany emotional dysregulation (Ellis & Thayer, 2010). Studies have found that listening to music may induce emotions through a process of emotional contagion (Lundqvist, Carlsson, Hilmersson, & Juslin, 2008), and this effect is more intense and evocative of emotionally positive states when listening to music with another person rather than on one’s own (Swaminathan & Schellenberg, 2015). One study found that music may be used therapeutically to distract from stress or anxiety related to undergoing surgical procedures (De Marco, Alexander, Nehrez, & Gallagher, 2011), and another study found that music may support active coping strategies for patients diagnosed with chronic pain (Koenig et al.,
Music may therefore be used purposively for self-regulation of emotional states (Thoma et al., 2012), though the evidence to suggest individuals elect to use music in this way is more limited in clinical populations compared with studies that canvassed normative community samples (Uhlig, Jashke, & Scherder, 2013). Studies have not explored the connection between using music to regulate emotion and clinical treatment, and a need for further research has been identified (K. S. Moore, 2013).

**Music, attention and consciousness.** Several studies have found that active engagement in musical performance or practise may contribute to the experience of flow, where a participant’s absorption in music-making arises from an interaction of positive emotion and heightened attention (Bakker, 2005; De Manzano, Theorell, Harmat, & Ullen, 2010; Dietrich, 2004) and is therefore considered to comprise a psychologically optimal condition characterised by cognitive balance and flexibility rather than a regressive or dissociative state (Croom, 2014; Hulsdunker, Mietau, & Struder, 2016). Musical training used in education and rehabilitation settings promotes attention control including the ability to discriminate, select and focus, and sustain and switch attention through auditory and other sensory mechanisms (Thaut & Gardiner, 2014; Wang, Ossher, & Reuter-Lorenz, 2015), and reduces auditory sensitivity in clinical groups where this may create attentional difficulties (Porges et al., 2014).

Music has been used throughout history to alter states of consciousness, which may include ritual and dance in order to seek experiences of transcendence or spirituality (Rouget, 1985). Quiet, contemplative music can be used to induce and maintain hypnotic states that may deepen relaxation and meditation (A. J. Johnson et al., 2017), and repetitive, rhythmic music is used by young people in many cultures to produce dissociative, trance-like states (Sacks, 2006). Individuals who experience dissociation consequent to trauma are more likely to seek out trance-inducing music; however research has not investigated whether this music may assist them to achieve normative rather than pathological dissociative states (Becker-
Blease, 2004), or whether music may be used as a therapeutic tool for this population (Gleadhill & Ferris, 2010).

**Music, perception and attribution.** Individuals frequently infer others’ intentions based on nonverbal auditory cues, and music may stimulate emotions that shape cognitive appraisal of a situation (Juslin & Vastfjall, 2008). A recent study found that inferences may be altered by music that activates memories, or is perceived as harmonically dissonant or consonant – a device frequently used in films, for example, where the audience is directed to judge a character or situation as ‘good’ or ‘bad’ based on music playing in the background (Bravo et al., 2017). Musical training has been shown to improve nonverbal and auditory processing (Peretz & Zatorre, 2005), and one study found that musicians who had experience of cause-and-effect ambiguity during group music making were less likely to misinterpret the intentions of others in ambiguous interpersonal situations compared with non-musicians (de Bezenac, Sluming, O'Sullivan, & Corcoran, 2015). Music may also be used to manipulate an individual’s expectations of what is to come, via the use of repetitive rhythmic and harmonic patterns that may be predicted to reoccur. Where patterns are interrupted, violated or delayed, the listener (or film-viewer) may experience strong emotions in response to their expectations being disconfirmed (Juslin & Vastfjall, 2008) or cycles of emotional tension followed by release where the expected pattern returns (Koelsch & Siebel, 2005). These properties of music may be used to support processes that teach the ability to move from dysregulated to regulated internal or interpersonal states, though empirical research for the therapeutic use of music in this way has not been conducted (Koelsch, 2015).

**Music and relationships.** Music may enhance relational wellbeing across the lifespan. Family music rituals and music listening in families and peer groups have been found to be strongly corelated with self-reports of family/peer cohesion across developmental stages and cultures (Boer & Abubakar, 2014), and an Australian study found that making music with others contributed to less social isolation and loneliness, and experiences of trust and
reciprocity for people over the age of 60 years (Hays & Minichiello, 2005). A review of the literature about the experience of flow during group music making found that involvement with a partner and feelings of togetherness were the main reasons cited for enjoying musical experiences (Schiepe-Tiska & Engeser, 2012). A further review of the literature about the social functions of music found that playing music in groups fosters the development of empathy, social connectedness and strengthening of interpersonal relationships (Koelsch, 2013). Accomplishment in music may confer positive social status and provide social identity which may positively impact interpersonal functioning (Croom, 2014), and working in a group toward a musical performance has been found to promote strong relationships among participants in groups who may otherwise have difficulty socialising including adults with spinal cord injuries, and children diagnosed with cancer (Hiscock, O'Callaghan, Goodwin, & Wheeler, 2013; Lee & Nantais, 1996). Studies have shown that music participation may improve communication and interpersonal skills including initiation of engagement and responsiveness for children with social skills deficits (Edgerton, 1994; Gooding, 2011; J. Kim, Wigram, & Gold, 2009), and for parents at risk of abusing or neglecting their children, who may require intervention that directly targets nonverbal processes in order to be able to shift automatic patterns of reactivity and/or non-responsiveness (S. Jacobsen & Killen, 2015; J. Schore & Schore, 2007). Music may therefore be an accessible medium for parents experiencing interpersonal problems consequent to childhood trauma, to build responsive patterns of relating with their child. Music has the capacity to facilitate playful and mutually satisfying interactions whereby nonverbal aspects of reciprocal communication and affect attument can be therapeutically reworked in the clinical context. Musical interplay can create or re-create experiences of shared timing, rhythm, pulse, melody and pitch, all of which are fundamental elements of attuned and responsive communication styles that foster the development of secure attachment in the parent-child relationship (S. Jacobsen et al., 2014).
2.4.2 Music, neurobiological processes and health.

Processing music is one of the most cognitively demanding tasks human brains can undertake, and creating and performing music is even more complex (Collins & Fleming, 2017). Music participation and listening activates multiple systems within the body and brain, though there is not a singular brain/body mechanism for ‘music’ as a generalised concept; rather diverse musical activities such as singing, playing an instrument, composing or listening to music may involve and contribute to the development of distinctive neurological and physiological processes (Reimer, 2004). Engagement with music may be considered from an biological and evolutionary perspective, where it functions to stimulate subcortical and right hemispheric neurological structures accentuating emotions that allow either survival (fight/flight) or caregiving behaviours to be planned and rehearsed (Peretz, 2010). Individuals may use music to initiate connection with others, and to generate sensory awareness and social cooperation that enhances bonding and attachment (Peretz, 2006). Music can be used to promote physical and mental health and healthy behaviours, functioning to support and motivate physical exercise and movement as well as enhancing stress reduction activities, for example (MacDonald, 2013).

Music and neurobiological processes. Functional neuroimaging studies investigating the neural correlates of music listening and participation have shown that music modulates activity in the amygdala, nucleus accumbens, hypothalamus, hippocampus, insula, cingulate cortex and orbitofrontal cortex, with important implications for the use of music in the treatment of psychiatric and neurological disorders where socio-emotional and/or psychomotor functioning is impaired (Koelsch, 2014). A review of studies about how music affects neurobiological processes has identified eight distinct mechanisms through which involvement in music is theorised to influence bio-psychosocial activity: these are brain stem reflexes, rhythmic entrainment, evaluative conditioning, emotional contagion, stimulation of visual imagery, evocation of episodic memory, musical expectancy, and aesthetic judgement.
(Juslin, 2013). Each of these are thought to represent different subcortical to cortical processes in the structural and functional development of the brain from the ‘bottom up’, and have been found to be underpinned by distinct systems that organise psychomotor responses, emotions, motivation, information processing, judgement and behaviour (Juslin & Vastfjall, 2008).

Studies investigating the effects of music listening and participation on the brain have found that musical training improves auditory brainstem function during sensitive periods in child and adolescent development (Skoe & Kraus, 2013), and can retrain the cerebellum, basal ganglia and cortical loops via a process called auditory-motor (rhythmic) entrainment, in order to stimulate movement in patients diagnosed with disorders affecting mobility such as Parkinson’s disease or cerebral palsy (Thaut, 2015). Judging whether a piece of music is aesthetically appealing while experiencing an emotional response has been found to deactivate auditory-limbic connectivity and co-activate brain regions related to cognitive processing of sounds, action observation and action preparation, and visual processing (C. Liu et al., 2017). Music listened to in this way may therefore support co-activation of thinking and feeling that may be disrupted consequent to trauma exposure (A. N. Schore, 2002). Emotion contagion in music has been defined as the link between recognition and feeling of emotions evoked by music (Egermann & McAdams, 2013), activating amygdala and nucleus accumbens activity that encourage actions that allow emotions and social situations to be approached, and hippocampal changes that regulate HPA-mediated stress responses (Koelsch, 2014).

Emotion-inducing music may therefore assist individuals who have a history of interpersonal trauma to reduce stress in order to approach rather than avoid emotions and social situations that may evoke traumatic memories (Hopper, Frewen, van der Kolk, & Lanius, 2007). Emotion contagion may also be thought of as a process of ‘embodied simulation’ whereby emotions triggered by music activate the mirror neuron system, which also allows understanding of others’ emotional experience to occur via mental imitation of their actions.
Where music is used to generate and support visual imagery and processing of memories the entire limbic and paralimbic systems are activated, indicating that music may both evoke and/or modify emotional responses to visual imagery and memories (Blood, Zatorre, Bermudez, & Evans, 1999; Jancke, 2008). When musical expectations are met, music gives individuals the ‘chills’ by triggering a targeted release of dopamine in the striatum when emotional arousal is at its peak (Salimpoor, Benovoy, Larcher, Dagher, & Zatorre, 2011), suggesting that music may be used to activate intensely rewarding and pleasurable emotional experiences for individuals who may otherwise seek these in ways that are injurious to their health (Koelsch, 2014). Music that violates what the listener expects to occur has been found to activate neural and physiological responses including heart-rate variability, breathing, galvanic skin response, amygdala activity, and increased neural activity indicating increased effort in auditory and affective processing (Steinbeis, Koelsch, & Sloboda, 2006). Listening to music that disconfirms expectations may therefore stimulate and exercise neural and physiological systems that may be dulled by prolonged trauma exposure (van der Kolk, 2009). The evocation of tension and resolution cycles by listening to Western tonal music in music therapy is claimed to restore emotional balance and wellbeing during engagement with music, though this hypothesis has not been empirically tested (Koelsch, 2015). Neurological involvement in musical enjoyment has been found to encompass limbic and paralimbic regions as well as reward circuitry, and the cingulate cortex, motor cortex and Broca’s area, indicating that listening to preferred music intensifies positive emotional engagement whilst activating brain regions responsible for motor control and emotion regulation (Pereira et al., 2011).

**Music and mental health.** The link between music participation and subjective wellbeing for people of all ages is well documented in the literature, finding benefits in evoking positive emotions, building resilience and coping, enhancing self-esteem and a sense of belonging in children, young people and adults across cultures (Marsh, 2017; Weinberg &
Joseph, 2016; Zarobe & Bungay, 2017). A systematic review of studies examining wellbeing outcomes for adults singing in community choirs found that participation increased morale and reduced risk of depression in adults, but noted that sub-groups who may be at greater risk of lower levels of wellbeing (e.g., individuals in marginalised communities) were not strongly represented in reviewed studies (Daykin et al., 2018).

Musical preferences have been found to be related to mental health status for adolescents, for example preference for heavy metal music was associated with higher suicidal risk in one study (Lacourse, Claes, & Villeneuve, 2001), and other studies found associations between rap, techno, hard rock and alternative music, and adolescents’ clinical depression and mood disorders (Doak, 2003; Miranda, 2013; Miranda & Claes, 2008). Studies have found mental health benefits for young people who actively participate in music-making including reduction of adolescents’ reactive aggression (Currie & Startup, 2012) and positive affects on adolescents’ self-perception and attributions (Shields, 2001). Emotion contagion was theorised in one study to be the mechanism by which positive emotions activated during music participation assisted in the development of empathy for young people with Autism Spectrum Disorder (ASD) (D. M. Greenberg, Rentfrow, & Baron-Cohen, 2015). The mental health benefits of music listening for adolescents, however, are less clear. Studies have found that boys diagnosed with depression experienced lower mood after listening to their preferred music (Dillman Carpentier et al., 2008), that music listening may be used as a form of emotional avoidance in clinically depressed girls (Miranda, 2009), and using music listening as a coping strategy predicts development of neurotic symptoms (Miranda, Gaudrea, & Morizot, 2010). For some clinical groups though, music listening may assist emotion regulation. One study found that listening to preferred music improved skin conductance responses and decreased self-reported anxiety in young adults with ASD compared with a matched control group, indicating they were responsive to music in regard to modulating their physiological state (Hillier, Kopec, Poto, Tivarus, & Beversdorf, 2015).
Other clinical groups with difficulties regulating physiological responses to anxiety, including adults with a history of childhood interpersonal trauma, may similarly benefit from listening to preferred music in order to manage physiological arousal, and a need for high quality studies has been identified (Koelsch, 2014).

Music has been used to assist adults with mental health diagnoses via utilising active and receptive musical activities to facilitate emotional, cognitive, behavioural and relational recovery (Nizamie & Tikka, 2014). A systematic review and meta-analysis of music therapy interventions in psychiatry found that music therapy can be effective in improving global state, level of general symptoms, negative symptoms, depression, anxiety and psychosocial functioning for individuals with severe psychotic and non-psychotic mental disorders, with improved active musical engagement hypothesised to be the mechanism of change, though many studies were limited by small sample size and methodological issues (C. Gold, Solli, Kruger, & Lie, 2009). Studies examining mental health outcomes in clinical populations have found, for example, that using music to generate and support visual imagery and processing of memories associated with grief or traumatic experiences may be effective in lowering blood pressure, beta-endorphin and cortisol levels (McKinney & Honig, 2016); singing lowers cortisol levels, elevates secretory immunoglobulin A levels and decreases self-reported negative affect (Kreutz, Bongard, Rohrman, Hodapp, & Grebe, 2004), that music therapy participation reduced self-reported anxiety, depression and increased self-esteem for male offenders in correctional settings (Chen, Leith, Aaro, Manger, & Gold, 2016); and that group drumming reduced markers of inflammatory immune responses as well as symptoms of anxiety and depression in mental health service users (Fancourt et al., 2016).

Engaging with music and music therapy may therefore assist individuals experiencing mental health issues consequent to childhood interpersonal trauma to reduce symptoms causing distress and improve wellbeing.
**Music and physical health.** Music listening is known to modulate exercise and physical activity, via cortical and subcortical stimulation and response, physiological arousal and subjective experience (Clark, Baker, & Taylor, 2015). Involvement in music as a leisure activity confers not just emotional and social benefits, but also neural benefits that are associated with physical health in clinical and nonclinical populations (Fancourt et al., 2014; Sarkamo, 2017). Singing has been shown to improve respiratory functioning (Goldenberg, 2018), and improve normative speech production consequent to acquired brain injury or stroke (Tamplin, 2008). The rhythmic properties of music have been used to retrain parts of the brain responsible for motor control, speech and language, memory and attention via auditory motor entrainment in patients with neurological conditions (Thaut, 2003). It is not known if utilising music in this way may be effective for assisting adults who face neurological challenges affecting memory and attention consequent to prolonged childhood interpersonal trauma exposure (van der Kolk et al., 2005). Listening to music has been found to be effective in reducing acute and chronic pain and increasing functional mobility in fibromyalgia, though the analgesic effects of the music itself have been hypothesised as being secondary to cognitive and emotional effects such as distraction, evocation of positive emotions and relaxation (Garza-Villarreal et al., 2014). Compared with fibromyalgia patients without a history of childhood abuse, patients who reported childhood interpersonal trauma have been found to experience greater pain severity (Ortiz, Ballard, Machado-Viera, Saligan, & Walitt, 2016); therefore the use of music to enhance acute and chronic pain management strategies may be considered as an additional resource for this group.

**2.4.3. Music and attachment.**

Music using frequencies similar to the human voice range and utilising prosodic vocalisation has been hypothesised to function phylogenetically as a means whereby the caregiving or attachment system may be activated, signalling a state of safety via the muscles of the inner ear which have evolved to distinguish the soft sounds of the human voice from
low frequency sounds that may signal threat from predators (Porges, 2011). Other studies provide additional support for the link between music and neurobiological mechanisms that activate attachment behaviour. Vasopressin, a hormone that affects social behaviour and bonding, has been found to be associated with musical memory (Granot et al., 2007). Oxytocin, which functions to strengthen caregiving and attachment behaviour, has been found in one study to increase in response to singing with others (Keeler et al., 2015) and another study showed that oxytocin was present in higher quantities in mothers and children where mothers spoke or sang to connect to their children compared with mothers who used direct physical contact (Seltzer et al., 2010).

Reciprocal imitation of vocalisation builds confidence and trust between parents and children, and is crucial to children’s language and social development (Papousek & Papousek, 1989). Parents may modulate their children’s arousal levels through singing (Nakata & Trehub, 2004), and using action or play songs to stimulate or lullabies to soothe children in a developmentally sensitive manner that supports the development of attachment bonds (Pasiali, 2014). Interactions between parents and their preverbal children may be considered intentional nonverbal communication that is musical in nature, characterised by spontaneous and improvised vocalisations that include variations of pitch, tempo, volume and nuance (Malloch & Trevarthen, 2009). Child-directed singing has been described as a form of emotional communication that is present in all cultures (Creighton, 2011), where vocal quality, melody and tonality convey emotions that support engagement, connection and/or comfort (Nakata & Trehub, 2004). Attachment continues to be an important part of parent-child relationships throughout childhood and adolescence, and both attachment needs and parental responses are more likely to be communicated indirectly as children get older, e.g., via tone or rhythm of the voice (Dunsmore, Her, Halberstadt, & Perez-Rivera, 2009). Adolescents may play their preferred music in order to indirectly communicate attachment needs that may require a sensitive response from their parent, and parents’ nonverbal
vocalisations of understanding, acceptance or support in response to their adolescents’ nonverbal expression of emotions may be understood as musical (Allen et al., 2002; Saarikallio et al., 2014).

The parent-child attachment relationship may become disrupted as the result of a parent’s failure to recognise or sensitively respond to their child’s nonverbal communication (Bugental, 2005). Depression and anxiety are characterised by changes in nonverbal communication including vocal tone and frequency (Ellgring & Scherer, 1996). Where a parent experiences depression or anxiety (which may occur consequent to childhood trauma experiences) these changes may represent behavioural manifestations of a parent’s preoccupied/unresponsive or disorganised/reactive state, and be experienced by a child as distressing (Adam, Gunnar, & Tanaka, 2004). Infant-directed singing has been used therapeutically with anxious mothers of pre-term infants, with a recent systematic review finding significant reduction in maternal anxiety and improvement in infant respiratory functioning for parent-infant dyads receiving music therapy intervention that supported parents to sing to their children compared with treatment-as-usual (Bieleninik, Ghetti, & Gold, 2016). Therapeutic benefits of infant-directed singing have been considered from an attachment perspective, however measures assessing attachment status have not been used in empirical studies (Pasiali, 2014; Shoemark, Hanson-Abrameit, & Stewart, 2015).

An assessment tool has been developed that uses structured musical activities to assess aspects of parent-child interaction that may indicate attachment difficulties where a child (5-12 years) is at risk of emotional abuse or neglect (S. Jacobsen & McKinney, 2014). Measures include how well parent and child are mutually attuned to each other, how clearly they communicate nonverbally, and how the parent responds to their child’s emotional expressions while they play musical instruments together. Therapeutic intervention then focuses on assisting parents to improve their interactions with their child, reduce stress that may affect parental responsiveness, and improve relational functioning. The authors
hypothesise that parent-child experiences of shared timing, pulse, melody and pitch are
natural elements of early attachment processes, and that creating or recreating these
experiences in a playful and reciprocal manner may allow parent-child dyads to establish or
re-establish interactive patterns that characterise secure attachment (S. Jacobsen et al., 2014).
Parent-adolescent dyads where a parent has a history of childhood interpersonal trauma may
similarly benefit from musical experiences that facilitate the development of interactive
processes characterised by playfulness and reciprocity, in order to improve an adolescent’s
sense of security in their relationship with their parent.

2.4.4 Music and mentalisation.

Mentalisation is thought to engage the mirror neuron system, and has been referred to
as a process of emotion contagion, to the extent that the movements of others are
automatically imitated in order to infer their emotional experience (Frith & Frith, 2006).
Mirror neuron activity is also offered as an explanation for the experience of ‘embodied
music cognition’ during group music making, where internal simulations of others’ musical
behaviour is required in order to understand their nonverbal communications, infer intentions
embedded in musical expression, appreciate what may be conveyed by a musical signal, and
distinguish one’s own musical expression from others in order to adjust effectively to
changing musical dynamics (Matyja, 2015). Group musical interaction has been found to
promote the development of empathy in children (Rabinowitch, Cross, & Burnard, 2012).
Greenberg et al. theorised that participating in and listening to music supports reflection
about emotions and intentions, therefore enhancing reflective functioning (D. M. Greenberg
et al., 2015). This theory is supported by an earlier study in which fMRI data showed that
neural networks dedicated to mental state attribution were automatically activated in response
to listening to music, and this correlation was stronger where participants thought that an
intention was expressed by the composer or performer (Koelsch, 2009). Musical interactions
activating parents’ neural systems that support reflective functioning have been used in
Jacobsen’s study described earlier (S. Jacobsen & McKinney, 2014) whereby structured musical activities create opportunities for parents to think about their child’s emotional experience and perspectives. Dyadic musical experiences that activate parents’ reflective functioning may also be helpful when intervening with parent-child dyads where a parent’s interpersonal trauma history has not supported them to develop the capacity to mentalise.

2.4.5 Music and nonverbal communication.

Music is often referred to in the literature as a nonverbal form of communication, where music and language are linked in preverbal communication strategies acquired in infancy (Peretz, 2006). Interactive patterns common to music and language include rhythm and vocal exchanges such as pairings of ‘question/answer’ or ‘offer/refusal’ that differ according to rise and fall of pitch and placement of accent; musical (instrumental or vocal) binary structures comprising two repeating sections that replicate ‘call/response’ speech patterns; and narrative three-part structures of beginning, middle and end can be heard in music or in parent-infant discourse, where tempo and volume increase and subside in each cycle (Eve, 2017). The notion that there is a close relationship between nonverbal vocal and musical expressions of emotion has also been considered. A review of 104 studies about vocal expression compared with 41 studies about musical performance found that there were similarities in the accuracy with which differing emotions were communicated to listeners, and the emotion-specific acoustic cues used to communicate each emotion (Juslin & Laukka, 2003). The term ‘communicative musicality’ described earlier refers to the inherent musicality of parent-infant nonverbal communication, and is characterised by distinctive qualities of parents’ voice, rhythm and melody that are common across all cultural groups and function as a form of proto-conversation that supports infants’ language, social and emotional development (Malloch, 1999). Communicative musicality ideally functions to allow coordination of infants’ emotional expression and parents’ understanding of motives and intentional states that informs their emotionally attuned response. Where parents can
ensure emotional arousal is maintained at an optimal level via cycles of emotional and physiological activation and modulation or ‘vitality affects’, multiple neurobiological systems are activated that create a multisensory and rich interpersonal experience and create the environment where an infant may develop secure attachment, reflective functioning and emotional regulation capacities (Stern, 2010). Where participation in music may replicate this experience for individuals, parent-child/adolescent dyads or community groups affected by trauma exposure, it has been conceptualised as a biopsychosocial resource, with the capacity to help regulate neurological and physiological systems in order to restore intra- and interpersonal functioning (Osborne, 2012). Music may therefore have the potential to assist parents with a trauma history and their adolescent to experience or regain the rhythmic, melodic and vocal patterns of nonverbal communication that characterise attuned communication and secure attachment.

2.4.6 Music therapy.

The ability to send and receive nonverbal communication messages is an important part of effective interpersonal functioning and therefore may be regarded as a target for therapeutic intervention. Current dyadic and family therapy interventions with parents and preschool children address these directly via nonverbal modalities such as play therapy (Lieberman et al., 2005). Parenting interventions may include psycho-education about the importance of nonverbal communication when conveying awareness, acceptance and empathy towards children’s emotions (Duncan, Coatsworth, & Greenberg, 2009; Havighurst, Wilson, Harley, Prior, & Kehoe, 2010); however, where parents lack these skills more guidance may be required (Asen & Fonagy, 2017b). Treatments for parents and older children privilege talking based therapy, which may activate patterns of conflict for parent-child dyads where a parent has experienced childhood interpersonal trauma. Other methods that actively engage parents and adolescents, and are effective with parents with an interpersonal trauma history may be required. Creative arts and experiential modalities
provide opportunities to work systemically with nonverbal processes in a similar way that play is utilised in family therapy with parents of younger children (Asen & Fonagy, 2012b; S. Jacobsen & McKinney, 2014). Young people use music to communicate and to express emotions nonverbally, and therefore music may be an accessible medium when working with parent-child relationships (Hallam, 2010). Music may be considered a ‘bottom-up’ approach in that it has the capacity to directly activate and regulate emotional and autonomic arousal, support emotional processing, and induce positive affective states during parent-child interaction (Fancourt et al., 2014; Panksepp & Bernatzky, 2002).

Music therapy is the intentional use of music by a trained therapist, utilising a range of music making methods in order to improve health, functioning and wellbeing within and through a therapeutic relationship (AMTA, 2018). Music therapy with parents and children utilises musical interplay to enhance clients’ ability to accurately notice, receive and interpret the nonverbal affective communication of others, and to connect with and then express their own emotions nonverbally (S. Jacobsen et al., 2014). A small number of studies have examined the effectiveness of music therapy with traumatised populations, and with parents and their children; they are summarised as follows.

**Music therapy with adults diagnosed with PTSD.** One study evaluated the provision of group drumming to veterans diagnosed with PTSD (C. Carr et al., 2012). Carr’s exploratory RCT employed a mixed method design, in which 17 patients with significant PTSD symptoms that had not responded to TF-CBT were randomly assigned to a treatment ($n = 9$) (10 week music therapy drumming group) or wait-list control ($n = 8$) condition. Symptoms were assessed on the Impact of Events Scale-Revised and Beck Depression Inventory II pre- and post-treatment. Treatment-group patients experienced a significant reduction in severity of PTSD symptoms and a marginally significant reduction in depression at 10 weeks from baseline compared to the control group (effect sizes not reported). Limitations included small sample size, use of self-report measures without observational or
other independent verification of results that may have resulted in expectancy bias, and lack of condition blinding. Strengths of this approach included using instrumental playing to foster safety and communicate, to increase a sense of self-agency, and to alleviate PTSD symptoms without the requirement that musical experiences are processed verbally. Drumming may be used to help parents with a history of childhood interpersonal trauma achieve a sense of safety, express emotions, communicate more effectively, and experience more self-agency in their parenting.

The Bonny method of Guided Imagery and Music (GIM) is a psychotherapy that uses recorded classical music to stimulate and support internally generated imagery in order to promote memory processing and work through significant life issues (Bonny, 1989). An uncontrolled pilot study examined the feasibility of using a modified trauma-focused version of GIM for adult refugees diagnosed with PTSD (Beck et al., 2017). The method was a modified version of Herman’s three-phased C-PTSD treatment model (Herman, 1992). Phases included (1) establishing stabilisation and safety; (2) experiencing containment of mixed emotions; (3) grief and trauma processing with music; and (4) orientation toward the future. Strategies to meet needs for safety and control included shortening music listening periods, giving choices about listening with eyes open or closed, giving options about which recorded music to listen to, and giving participants control over volume and duration of music exposure in order to manage affective arousal. Sixteen participants completed 16 one-hour individual sessions over 26 weeks, and showed significant pre-post improvements in PTSD symptoms as measured by the Harvard Trauma Questionnaire \( (d = 1.17) \), sleep quality (Pittsburg Sleep Quality Index; \( d = 1.15 \) ), wellbeing (World Health Organisation-5 Wellbeing Scale; \( d = 0.62 \)) and social function (Global Assessment of Functioning – Social Function; \( d = 0.81 \)). Limitations of this study are lack of a control comparison group; strengths include the provision of self-care strategies for participants to use at home to manage PTSD symptoms. Parents with a history of childhood interpersonal trauma may benefit from using
music as a resource that enhances their sense of control in managing symptoms that may interfere with their ability to achieve a sense of safety and security, including in their relationship with their child.

**Music therapy with adults who have experienced interpersonal trauma.** A RCT examined whether music therapy may reduce anxiety, sleep quality and depression for women who had experienced interpersonal violence, living in a homeless shelter (N = 28) (Hernandez-Ruiz, 2005). Compared with controls, women who received music therapy daily for 5 days (listening to recorded music selected by the participant and a progressive muscle relaxation script) showed greater reduction in anxiety (as measured by the State-Trait Anxiety Inventory) and improved sleep quality (measured by the Pittsburgh Sleep Quality Index) compared with women who received no therapeutic intervention (effect sizes not reported). Depression symptoms remained unchanged. A limitation of this study was a lack of comparison between the music therapy condition and a condition where progressive muscle relaxation was provided without accompanying music. Strengths were assisting participants to identify and use their choice of music as a personal resource for self-management of posttraumatic symptoms. Recorded music may enhance stress reduction strategies for parents with a trauma history allowing them to reduce anxiety and regain sleep quality after traumatic experiences, which in turn may assist them to regulate their emotions while parenting.

**Music therapy with adults who have experienced childhood interpersonal trauma.** A non-randomised study compared GIM with another trauma psychotherapy approach (Psychodynamic Imaginative Trauma Therapy – PITT), a waitlist group, and a matched group who had completed GIM therapy one year prior to the study (N = 136) (Maack, 2012). Results showed significant differences between GIM, PITT and the waitlist control group, with reduction of symptoms of C-PTSD and dissociation, and improved quality of life and interpersonal relationships compared to participants in other treatment groups and the control
condition. Measures used were self-report of DESNOS (effect size not reported as sample was non-normally distributed), dissociative experiences ($d = 2.55$), interpersonal problems (effect size not reported) and sense of coherence ($d = 2.85$). Limitations with this study were that it was conducted with women rather than a mixed gender group, and only self-report measures were used. Strengths of this method include use of recorded music to connect to emotions, increase relaxation, decrease hyper-vigilance, control dysregulated anger responses, and reduce intrusive thoughts and numbing. These ways of using music may be a resource for parents with a history of childhood interpersonal trauma to moderate their responses to their children.

**Music therapy with parents and children.** Family-centred music therapy has been used to improve social interaction for children (3-6 years) diagnosed with Autism Spectrum Disorder (ASD). A small controlled mixed methods study ($N = 23$) found that compared with controls, children with severe ASD who took part in 16 forty-minute weekly family-centred music therapy sessions showed significant improvements in social interaction ($d = 1.96$) in their home and community compared with controls as measured by the clinician-rated Vineland Social Emotional Early Childhood Scale (Interpersonal Relationships and Play and Leisure Time Subscales). Qualitative analysis showed that post-intervention parents experienced the parent-child relationship as stronger (Thompson, McFerran, & Gold, 2013). Family-centred music therapy involves using songs, musical improvisation and movement to music to encourage reciprocal parent-child interactions. Limitations of the study included the use of change scores derived from T-tests to measure statistical significance rather than more rigorous statistical analysis methods; strengths included the use of musical activities to support parental attunement and active participation with their child. Developmentally sensitive musical activities that foster active parent-child interaction and strengthen parents’ positive experiences of the parent-child relationship may similarly be beneficial for parents with a history of childhood interpersonal trauma and their adolescent.
“Sing & Grow” is a music therapy programme developed for socially disadvantaged parents and their children (0-3 years) (Nicholson, Berthelsen, Abad, Williamson, & Bradley, 2008). Preliminary studies have shown significant improvements in parent-child relationships and in children’s behaviour (Nicholson, Berthelsen, Williamson, & Abad, 2010). While not specifically designed for parents with a history of childhood interpersonal trauma, the program has been successful in engaging ‘hard to reach’ families from communities that have been subject to extensive intergenerational traumatisation, including Australian indigenous communities (Williams, Teggelove, & Day, 2014). Although this program has been evaluated, the research design used did not include comparison with a control condition. Strengths of this program are its focus on using music with parent-child dyads to build a parent’s confidence in connecting positively with their child. Although methods are based on what is developmentally appropriate for young children, interventions for parents and their adolescent children may similarly use this style of music therapy to draw attention to, model and support positive nonverbal communication, and to calm both parent and young person.

An RCT was conducted investigating the effect of a dyadic music therapy on parent-child interactions in families at risk, where there were emotionally neglected children between 5 and 12 years of age (S. Jacobsen et al., 2014). Eighteen parent-child dyads were randomly assigned to receive 10 weekly music therapy sessions (n=9) or treatment as usual (n=9) comprising psycho-education about behavioural strategies, parental self-care and children’s development. Those attending music therapy had significantly higher parenting competencies, positive parent-child interaction and reduced parental stress as measured by an observational music therapy assessment tool ($d = 1.77$) (S. Jacobsen, 2012), and by parent self-report measures ($d = 0.57$), compared with those in the treatment as usual condition. Limitations of this study included the small sample size, and the researcher was also one of the clinicians. Strengths of this approach are the music therapy methods used, in particular nonverbal modelling and encouragement, and supporting parent-child attuned
communication, which may be helpful in interventions with parents who have a history of childhood trauma.

Music-based family therapy considers the way a family plays music together as a metaphor for how they function, and uses music-based assessment tasks to get information about family roles, communication, power dynamics and dysfunctional interaction patterns. Musical exercises are then used as a vehicle to work directly with nonverbal family dynamics by giving parents and children a shared experience of attuned communication via timing, rhythm, pitch, pulse and melody (Hibben, 1992; Miller, 1994). However, because this work has yet to be subject to empirical evaluation, it is not yet known to what extent music-based family therapy is effective.

Music therapy studies have shown that using a nonverbal, bottom-up approach may be effective when assisting adults who have experienced trauma to reduce PTSD and C-PTSD symptoms including dissociative experiences and to improve interpersonal functioning and better regulate emotions, though findings are emergent and warrant further investigation. Studies have also found that music therapy may enhance parent-child relationships for dyads where parents may have experienced interpersonal trauma. Music may therefore be considered a promising modality to support parents with a history of childhood interpersonal trauma, who are experiencing high levels of conflict in their relationship with their adolescent.

2.5 Summary and Theoretical Model

In summary, parents who have experienced childhood abuse or neglect often struggle with interpersonal functioning including nonverbal aspects of communication which may influence autonomic/emotion regulation during parent-child interaction (A. N. Schore, 2002). These challenges may in turn affect their parenting (Crittenden, 2009) and emotion socialisation practices (Katz, Maliken, & Stettler, 2012). The challenges of parenting an adolescent may trigger a parent’s memories of earlier abuse, intensifying reactivity and/or
non-responsiveness during conflict and resulting in negative cycles of relating (Davidson, 1980).

Evidence-based treatments for PTSD and C-PTSD that may be required as the result of childhood abuse are reliant on ‘top down’ cognitive processes that assume volitional control over automatic and implicit processes, and may be less effective for individuals experiencing chronic autonomic dysregulation and dissociative states (A. N. Schore, 2002). Exposure therapies, while reporting large effect sizes, are limited by large numbers of patients dropping out of treatment, and have noted smaller effect sizes where individuals have C-PTSD or dissociative symptoms (Corrigan & Hull, 2015). There is some evidence that focussing on relational functioning and emotion regulation without direct exposure to traumatic memories may reduce PTSD symptoms, however it is not known whether therapies with these foci may assist individuals with a more entrenched insecure attachment style consequent to interpersonal trauma in childhood (Robertson et al., 2008). ‘Bottom up’ therapies targeting autonomic sensory and somatic processes in order to assist with emotion regulation may be helpful, but have not developed an evidence base.

Systemic and parenting therapies for parents with an interpersonal trauma history have focussed on parents and their young children rather than adolescents, and integrate ‘bottom up’ methods via the use of play, music and touch which encourage attuned nonverbal communication with ‘top down’ methods including psycho-education and skill development (e.g., Lieberman, et al., 2005). More research is required to discover whether these methods may be effective for parent-adolescent dyads where a parent has a history of childhood interpersonal trauma. A recent review of the research has concluded that parents with an interpersonal trauma history require systemic interventions that focus on restoration and re-establishment of secure attachment relationships, with specific attention to regulation of hyper- (reactivity) or hypo-arousal (non-responsiveness) in response to the unique trauma triggers evoked by parent-child interaction, and that further intervention that targets this is
needed (van Ee et al., 2015). Parent-adolescent dyads where a parent has a history of interpersonal trauma and where the dyad are experiencing high levels of conflict in their relationship may therefore require an integrated approach that addresses cognitive, emotional and autonomic (sensory and somatic) levels of functioning within a systemic framework.

A theoretical model is presented in Figure 1, which summarises the multidirectional and interacting pathways via which parent-adolescent conflict is initiated and maintained, and consequently where therapeutic intervention may best be targeted. The model proposes that parent and adolescent cognitive, emotional and autonomic functioning both influence and are influenced by parent-adolescent conflict interaction (P-A conflict). For example, a parent’s negative attributions about their adolescent’s emotionally dysregulated expression during P-A conflict may mean they are punitive in the way they speak to their adolescent, causing the adolescent to become further emotionally and autonomically dysregulated, which then means the adolescent may withdraw from conflict interaction (flight response), react defensively (fight response) or become unable to respond (freeze response).

Additionally, cognitive, emotional and autonomic processes influence and are influenced by each other for both parent and adolescent separately, which in turn affects P-A conflict. For example, a parent’s trauma-related beliefs about their adolescent’s intentions during P-A conflict may influence their emotional reactivity or responsiveness; this in turn may influence their sensory experience (i.e., they may perceive their adolescent’s tone of voice as loud) and/or behavioural expression (i.e., their voice may in turn become louder) during P-A conflict. An adolescent’s somatic response to their parent’s faster tempo (i.e., the parent paces rapidly or makes quick gestures during P-A conflict, and in response the adolescent’s heart rate becomes elevated) may negatively affect their capacity to remain emotionally regulated, and this may influence the adolescent’s thoughts about their parent during P-A conflict. The model therefore suggests that intervention target autonomic, emotional and cognitive aspects of individual and dyadic functioning (i.e., by teaching
sequences of nonverbal communication that assist both parent and adolescent to remain autonomically and emotionally regulated during P-A conflict; providing psycho-education to parent and adolescent about helpful ways to express and respond to emotions).

It is additionally proposed that a combination of ‘top down’ (i.e., psycho-education, skill development) and ‘bottom up’ (i.e., the use of music to directly work with nonverbal and autonomic processes that affect emotion regulation) strategies may be required in order to adequately address each aspect of functioning. This integrated approach may give both parent and adolescent tools that may alter their experiences of and cognitions about their relationship during P-A conflict.
Figure 1: Theorised mechanisms influencing parent-adolescent conflict interaction
2.6 Aims and Research Questions

This study aimed to evaluate the effectiveness of Tuning Relationships with Music™ (TRM), an intervention developed by the author. TRM addresses parent-adolescent conflict where a parent has experienced childhood abuse or neglect, using music to target nonverbal communication and emotional/autonomic regulation during conflict interaction as a part of effective interpersonal functioning. TRM focuses on teaching parents and adolescents skills in emotion regulation (including managing trauma triggers for the parent), then adaptive emotion socialisation skills for the parent (emotion coaching) to respond to their adolescent using skills such as ‘turning toward’, ‘sitting with’ and ‘softened start-up’ (Gottman et al., 1996; Havighurst, Harley, Kehoe, & Pizarro, 2012).

Focusing on emotion coaching is the basis of an evidence-based parenting program entitled Tuning in to Teens (Havighurst et al., 2012), from which psycho-educational materials were taken for use in TRM. TRM teaches dyads skills in identifying, empathically responding to and regulating their own emotions as a precursor to the parent learning emotion coaching. Using instruments that require no musical training, dyads master nonverbal elements of emotional expression and empathic response (i.e., volume, tempo, turn taking) before verbal equivalents are introduced. Adolescents are asked to adopt the role of ‘expert’ in how they feel and what they need from their parent, to accept their parent’s efforts to use skills learned in therapy, and to give constructive feedback about what assists them to regulate and communicate their emotions. Once skills are mastered, dyads revisit conflict issues and practice working through these nonverbally with music. Parents are then supported to use emotion coaching during verbal conflict discussions, whilst maintaining an awareness of nonverbal communication and autonomic/emotional arousal. Adolescents are supported to remain engaged in the conflict discussion, to regulate their emotional and autonomic
response, and to use ‘turning toward’ and ‘softened start up’ when communicating with their parent.

In order to evaluate the effectiveness of the intervention, the following research questions were asked:

- Does Tuning Relationships with Music™ (TRM) increase responsive patterns of relating between parents with a history of childhood interpersonal trauma and their adolescent?
- Does TRM reduce conflictual and negative escalating cycles of interaction between parents with a history of childhood interpersonal trauma and their adolescent?
- Does TRM increase emotion coaching in parents with a history of childhood interpersonal trauma?
- Does TRM improve mental health outcomes for adolescents of parents with a history of childhood interpersonal trauma?

2.7 Research Objectives

This thesis includes three papers, each with specific research foci. The first paper is presented in chapter 4, which is a review of the literature about nonverbal communication and how it is assessed and included in interventions with parent-child relationships. The paper aimed to discover what validated and reliable assessment tools exist to measure nonverbal communication, to what extent these are used to inform therapeutic practice in order to improve nonverbal communication in parent-child relationships, and to identify what gaps may exist, in order to consider implications for further intervention research and development, including the development of TRM.

The second paper is presented in chapter 5 and reports the results of a randomised controlled trial of TRM. The paper examined whether participating in TRM increased responsive patterns of relating, reduced conflict, improved parents’ emotion coaching, and improved adolescents’ mental health. Parent and adolescent self-report measures and clinical
observation were used to examine if there were statistically and clinically significant changes for those participating in TRM. Clinically significant change was examined in order to find out whether TRM was effective in moving parent-adolescent dyads from scores that indicate a clinical level of difficulties to one more typical of the ‘normal’ population (N. S. Jacobsen & Traux, 1991).

The third paper is presented in chapter 6 and is an analysis of whether emotion regulation, consistency and predictability during a conflict interaction changed for parents and adolescents who participated in TRM. This paper aimed to assess nonverbal components of parent-adolescent conflict interaction in detail, using state space grid analysis (Hollenstein, 2013). An exercise developed specifically for this study asked parents and adolescents to represent their conflict using musical instruments, showing ‘everything but the words’ about their conflict interaction. State space grid analysis allowed a systemic analysis of the dyad as a single unit, rather than examining parents and adolescents as two independent participants. Further detail re assessment of nonverbal conflict exercises developed for papers 2 and 3 may be found in Appendix C.

Papers 1, 2 and 3 comprise distinct journal papers. They each include introduction, method, results and discussion sections. For this reason, no further information about the PhD methodology is provided except for a detailed description of the TRM intervention in the following chapter.
Chapter 3: Tuning Relationships with Music™—Overview and Session Description

This chapter contains a detailed description of Tuning Relationships with Music™ (TRM), including intervention overview and structure, method of delivery, and session content.

3.1 Intervention Overview and Structure

TRM is a brief systemic music therapy intervention designed to address parent-adolescent difficulties where a parent has a history of interpersonal trauma. Psychoeducational materials used in TRM that address emotion coaching skills are taken from the TRM is to be used as a precursor to ‘family therapy as usual’ where issues causing conflict may be further discussed and verbal emotion coaching, communication and conflict resolution skills can be consolidated. TRM fits within the stabilisation phase of Complex Posttraumatic Stress Disorder treatment consensus guidelines, which focuses on establishing safety, and improving emotional and interpersonal functioning (Cloitre et al., 2012).

Key principles of TRM are additionally drawn from empirically derived theories and evidence-based therapies as outlined in the preceding review; and can be summarised as follows. 1) Establishing interpersonal safety needs to occur before functioning can improve (i.e., assisting a parent to experience their adolescent as non-threatening allows them to then respond to their adolescent in a way the adolescent perceives as safe), and before issues causing parent-adolescent conflict can be addressed. 2) Assisting parents to experience and consequently provide a sense of safety in the parent-adolescent relationship requires attention to nonverbal and autonomic processes that affect their functioning. 3) Parents will need to learn skills, be equipped with sensory (i.e., auditory) and somatic resources and receive support during parent-adolescent interaction so that they can be non-reactive and responsive to their adolescent’s emotions that may underpin conflict interaction. Nonverbal ‘bottom up’
strategies (i.e., strategies that support autonomic regulation) are taught in combination with cognitive ‘top down’ methods (i.e., skill development) in order to address each of these.

TRM has five tasks which are taught sequentially: these are 1) emotion awareness (including awareness of sensory and somatic aspects of emotional states), 2) connecting to emotions, 3) responding to emotions, 4) communicating emotions, and 5) using emotional competence and emotion coaching skills when problem solving, limit setting and interacting around issues that may cause conflict. A summary of goals and tasks is presented in Table 1. Tasks are completed over eight sessions. The next sections provide detail about the structure of sessions, and a detailed outline of each session.
<table>
<thead>
<tr>
<th>Goals</th>
<th>Key tasks parent</th>
<th>Key tasks adolescent</th>
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</thead>
</table>
| 1. Emotion awareness | Awareness of own emotions  
- Awareness of internal body states  
- Awareness of body sensations connected with emotions  
Awareness of adolescent’s emotions  
- Awareness of adolescent’s differing emotions and expressions  
- Awareness of own emotional response to adolescent’s emotions | Awareness of own emotions  
- Awareness of internal body states  
- Awareness of body sensations connected with emotions  
Awareness of parent’s emotions  
- Awareness of parent’s differing emotions and expressions  
- Awareness of own emotional response to parent’s emotions |
| 2. Connecting to emotions | Understanding purpose of emotions  
Accepting emotions  
Understanding role of emotional disconnection and/or dysregulation in childhood trauma experience  
Turning toward (TT) own emotions  
- TT internal body states  
- TT body sensations  
- Labelling emotions  
- Understanding internal negative escalating cycles (NECs)  
Sitting with (SW) own emotions  
- SW internal body states  
- SW anxiety, sadness, anger  
Regulating own emotions (ER)  
- Able to identify and use ER strategies | Understanding purpose of emotions  
Accepting emotions  
Turning toward (TT) own emotions  
- TT internal body states  
- TT body sensations  
- Labelling emotions  
- Understanding internal NECs  
Sitting with (SW) own emotions  
- Sitting with internal body states  
- Sitting with anxiety, sadness, anger  
Regulating own emotions (ER)  
- Able to identify and use ER strategies |
| 3. Responding to emotions | Understanding adolescent emotional development  
Turning toward (TT) adolescent’s emotions  
- TT adolescent’s nonverbal emotional expressions  
- TT adolescent’s indirect verbal expressions of emotion  
- TT adolescent’s direct verbal expressions of emotion  
- Recognising /accepting adolescent’s TT  
- Understanding interpersonal NECs  
Sitting with (SW) adolescent’s emotions  
- SW adolescent’s anxiety  
- SW adolescent’s sadness  
- SW adolescent’s anger  
- SW own emotions that are activated in response to adolescent’s emotions  
- Knowing how to SW adolescent’s differing emotions in a way that the adolescent finds helpful  
- Accepting that at times adolescent may not find SW helpful  
Co-regulating adolescent’s emotions  
- Able to identify and assist with additional strategies that help adolescent self-soothe | Turning toward (TT) parent’s emotions  
- TT parent’s emotionally regulated verbal emotional expressions  
- Recognising /accepting parent’s TT  
- Understanding interpersonal NECs  
Respond to parent’s sitting with (SW) emotions  
- Directly communicating to parent when SW is not helpful (e.g., need to be alone) |
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<th>Goals</th>
<th>Key tasks parent</th>
<th>Key tasks adolescent</th>
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<tr>
<td>4. Communicating emotions</td>
<td>Softened start-up (SSU)</td>
<td>Softened start-up (SSU)</td>
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<td></td>
<td>- Using SSU to communicate emotions</td>
<td>- Using SSU to communicate emotions</td>
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<td>- Using SSU in addition to TT and SW to communicate understanding of adolescent’s emotions</td>
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<td><strong>Principles of safe communication</strong></td>
<td><strong>Principles of safe communication</strong></td>
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<td></td>
<td>- Assertive communication strategies</td>
<td>- Assertive communication strategies</td>
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<td></td>
<td>- Respectful language and nonverbal communication</td>
<td>- Respectful language and nonverbal communication</td>
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<td>- Direct verbal expression of emotions</td>
<td>- Direct verbal expression of emotions</td>
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<td>- Emotion coaching and active listening</td>
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<td></td>
<td><strong>Softened start-up (SSU)</strong></td>
<td><strong>Softened start-up (SSU)</strong></td>
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<td>- Using SSU to communicate and/or problem solve about an issue that may cause conflict</td>
<td>- Using SSU to communicate and/or problem solve</td>
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<td>- Using SSU to set limits in a way that acknowledges adolescent’s emotions about the limit</td>
<td>- Using SSU in addition to TT to respond to parent’s emotionally regulated efforts to problem solve and set limits</td>
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<td><strong>Principles of safe communication</strong></td>
<td><strong>Principles of safe communication</strong></td>
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<td>- Blending assertive communication strategies with emotion regulation and emotion coaching skills</td>
<td>- Assertive communication strategies</td>
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<td>- Respectful language and nonverbal communication</td>
<td>- Respectful language and nonverbal communication</td>
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<td>- Maintaining awareness of nonverbal communication skills</td>
<td>- Maintaining awareness of nonverbal communication skills</td>
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<td></td>
<td>- Active listening strategies</td>
<td>- Direct verbal expression of emotions</td>
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<tr>
<td></td>
<td>- Accepting adolescent’s influence and negotiating limits where appropriate</td>
<td>- Accepting parent’s influence and negotiating limits where parent deems this is appropriate</td>
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</tbody>
</table>
3.2 Method of Delivery

TRM sessions were conducted weekly over eight weeks with each session lasting one hour. Where parents and adolescents were not able to attend a session, this was rescheduled at a time that was mutually convenient for the family and therapist. Sessions were held on a weekday, or on Saturday mornings, and were facilitated by the author. Sessions took place at participating community services in Melbourne, at the University of Melbourne, or at the author’s private practice rooms. A structured manual, containing goals for each session, detailed session outlines, and psychoeducational handouts was used to ensure treatment fidelity and integrity, and the author completed fidelity checklists after each session to ensure 100% of program content was covered. Additional psychoeducational materials were drawn from the Tuning in to Teens program manual (Havighurst et al., 2012).

3.3 Outline of Sessions

TRM comprises 8 sessions of therapy that include individual parent, adolescent and conjoint sessions. This allows gradual scaffolding of the skills and process. Individual sessions are used to engage parent and adolescent, clarify issues that may need particular focus in therapy, and to give the parent psycho-education and teach skills that do not require the adolescent’s presence. Conjoint sessions are structured as follows: 1) check in including feedback re completion of homework tasks, 2) warm-up exercises and consolidation of previously learned skills, 3) introduction and practise of new skills, 4) discussion of how to generalise skills, then 5) setting homework tasks. The therapist takes a selection of musical pitched and unpitched percussion instruments, psycho-education handouts and a fidelity checklist into each session.

3.3.1 Session 1: Parent engagement (task 1): individual session.

Session 1 is an individual meeting with the parent. The first goal of the session is engagement, achieved by asking parents to identify what they would like to gain from attending TRM, to air any concerns they may have about the process or about their
adolescent, followed by discussion about how participation in TRM may achieve the parent’s goals and address concerns. Next, an overview of the eight sessions is provided. Psycho-education is given about emotional intelligence and emotion coaching (Havighurst et al., 2012), and the effects of trauma on emotions, relationships and parenting. Parents are invited to reflect on their ‘meta-emotion philosophy’ or beliefs about emotions (Gottman, Katz, & Hooven, 1997), and how emotions were expressed and responded to in their family of origin. Parents with a history of childhood abuse or neglect may have experienced abusive (punitive) or neglectful (dismissive) responses to their expression of emotions, and therefore benefit from the opportunity to reflect on how this has shaped their attitude toward and awareness of their own and their adolescent’s emotions (Gurtovenko & Katz, 2017).

Parents are then introduced to ways of using musical instruments which may allow them to become aware of their own emotional states and sensations in the body that accompany these, via exercises such as listening to an instrument being played and noticing how this makes them feel, and what body sensations may be evoked. Parents with a history of interpersonal trauma may face difficulties in either awareness of emotions, and/or becoming emotionally flooded in response to either environmental or internal cues (Berenbaum, 1996; Mead et al., 2010). Conducting music-based emotional awareness exercises with a parent allows the therapist to assess the extent to which the parent may have difficulty with emotional awareness and/or emotional/autonomic regulation, and provides an opportunity to teach strategies that either amplify emotional awareness and/or regulate an intense emotional response without the adolescent present, which can then be reinforced in future sessions.

Strategies that regulate emotion are taught using musical instruments that utilise harmonic frequencies within the human voice range, as this is thought to deactivate defensive or dissociative states and activate restorative autonomic and emotional states via the muscles of the inner ear connected to the ventral vagal system, which is associated with social engagement and caregiving behaviour (Porges, 2011). Strategies are developed in
collaboration with the parent (i.e., the parent is invited to experiment with different musical instruments and/or body sounds in order to discover which sound may be most effective in assisting them to connect to or regulate emotion and/or autonomic states), and are then embedded into interactive parent-adolescent sequences in later conjoint sessions. The parent is then asked to think about how they may use these strategies at home (e.g., using recorded music; audible breathing technique; humming), and to practise these before the first conjoint session.

3.3.2 Session 2: Adolescent engagement (task 1): individual session.

Session 2 is an individual meeting with the adolescent. As with the parent’s individual session, the first goal is engagement, achieved by asking adolescents to identify what they would like to gain from attending TRM, to air any concerns they may have about the process or about their parent, then discussing how participation in TRM may achieve the adolescent’s goals and address concerns. A key aspect of engagement is conveying the belief that the adolescent is the ‘expert’ about their own thoughts, feelings, and intentions, and that information about their perspectives is of vital importance so that the therapist can assist the parent to respond to their adolescent in ways that the adolescent experiences as emotionally and physiologically safe.

Next, an overview of the eight sessions is provided, and then psycho-education is given about emotional intelligence. The adolescent is asked to conduct a brief self-assessment about their emotional intelligence (competence), identifying strengths as well as challenges. They are additionally asked to comment on whether they consider their parent to be aware of which skills they have, and which emotional competencies they find more difficult, in order to assess further aspects of parent-adolescent emotional communication difficulties that may warrant attention in later sessions. Adolescents who have experienced their parent’s lack of responsiveness and/or heightened reactivity to their emotional expressions may be reluctant to allow their perspectives to be communicated to their parent (Diamond et al., 2003).
Therefore it is important to reassure adolescents that information they provide in this session will be kept confidential, and is gathered solely in order to assist the therapist in working effectively with the parent.

As in the parent’s individual session, adolescents are then introduced to using musical instruments to facilitate awareness of their own emotional states, and how these may be experienced in the body. Similar exercises are used as with the parent, and assistance is given to help the adolescent regulate their response if required. The therapist may use exercises to assess the adolescent’s level of emotional awareness in order to inform pacing of further sessions, as with the parent session.

Musical exercises where the therapist plays instruments that may evoke different emotions are also conducted to explore the adolescent’s experiences of their parent’s emotions, and the adolescent’s awareness of their own emotional response to their parent’s emotions. While it is important to reassure adolescents that this information will be kept confidential, adolescents are also encouraged to consider whether they would be willing to share this in joint sessions. It is explained that the adolescent’s information will assist their parent to learn more about their emotional experience so they can be supported to adjust their response. If the adolescent is not willing to consider this, the therapist then negotiates other ways s/he may introduce the adolescent’s perspectives to the parent (e.g., role plays of hypothetical scenarios). The therapist should stress the importance of being able to find a way to use this essential information in a way that the adolescent will feel safe with, in order for therapy to be effective. Conversations such as these are deemed crucial steps toward giving the adolescent a sense of confidence that the process of therapy will be safe, and that their needs and perspectives will be taken seriously. Successfully engaging adolescents in psychotherapy is thought to require offering choice, working collaboratively, and being candid about the limits, scope and content of therapy (Oetzel & Scherer, 2003).
3.3.3 Session 3: Conjoint session (task 1 and introduction to task 2.)

Session three is the first conjoint session with parent and adolescent, and begins by inviting each of them to share elements of their experience and learning from their individual sessions. Next, emotion awareness exercises are repeated again, but this time the parent or adolescent (rather than the therapist) each represent their expression of differing emotions on a musical instrument, while the other guesses which emotion they are representing. Frequently the parent and adolescent will represent each emotion somewhat differently to the other (e.g., one may show their experience of anger as fast, loud and with an irregular rhythm; the other may represent anger as a slow and/or rhythmic state). The goal of this exercise is to introduce the idea that emotions may be experienced quite differently by various individuals; that there is not a ‘right’ or ‘wrong’ way to experience an emotion; and that when others experience emotions in a way that differs from our own experience we may miss or misinterpret how they are feeling.

From there, the parent and adolescent are asked to reflect on the purpose of emotions (e.g., understanding fear as a source of information about a situation that may not be safe). They are encouraged to adopt a position of accepting emotions as an important source of information, which may be helpful when deciding how to understand and therefore respond to a situation, as an introduction to task 2 (connecting to emotions). Then, the therapist asks parent and adolescent to alternate representing an emotion on a musical instrument, and plays another instrument in a way that represents turning toward, away or against their music playing. This exercise aims to give parents and adolescents an experience of how ‘difficult to manage’ emotions may remain heightened or become more intense when they are turned away from or against, but may lessen in intensity when they are turned toward. Parent and adolescent are then asked to reflect on how they may ‘turn toward’ rather than away or against their own ‘difficult to manage’ emotions, and what strategies may enable them to do this. Where parents and adolescents are not able to identify strategies, the therapist provides
information about using emotion awareness and connection exercises (e.g., notice then label the feeling). The therapist may also use musical instruments to support teaching of emotional awareness and/or emotional regulation strategies such as playing a resonant instrument that may heighten awareness of body sensations connected with an emotion, or providing a rhythm to pace diaphragmatic breathing. Strategies identified in individual sessions may be reinforced and practiced again at this point, with care taken to ensure parents are supported to use strategies practiced in their individual session to manage dysregulated responses that may be triggered by their adolescent’s emotional expressions. Parents are also assisted to become aware of, accept and support their adolescent’s strategies for managing emotional dysregulation.

Parents and adolescents are then introduced to the concept of ‘sitting with’ their own feelings as an extension of ‘turning toward’, and are encouraged to identify strategies that may allow them to sit with their feelings in a range of situations at home, school, work etc. Music exercises are used to assist them to identify strategies that may be effective, for example, the therapist may play quietly, rhythmically, slowly, or alternate playing with periods of silence alongside a parent’s or adolescent’s representation of anger, and ask the parent or adolescent to comment on which response they find more helpful. They are then encouraged to reflect on ways they can respond to their own emotions using strategies that induce a sense of (for example) stillness or rhythmicity in a range of contexts. Parents are asked to observe and comment on the adolescent’s experience and identified strategies, to reflect on how they may become aware that their adolescent needs a quiet or rhythmically energetic space in order to self-regulate, and to discuss with their adolescent ways they may support them to utilise their identified strategies. ‘Turning toward your own feelings’ and ‘sitting with your own feelings’ handouts are given to both parent and adolescent at the end of this session. Both parent and adolescent are asked to notice opportunities where they may
‘turn toward’ or ‘sit with’ their feelings during the week, and to practise strategies discussed and worked on in the session.

3.3.4 Session 4: Conjoint session (tasks 2-3).

The first portion of session 4 is used to check in with parent and adolescent about their experience of the previous session, whether they have found opportunities to practise skills, and if so, what their experience of practising skills was like. Where dyads have not practised skills at home, they are asked to consider situations where skills might have been used, and how they could have used the skills. Warm-up exercises are then used to consolidate skills learned in session 3.

Next, musical exercises used previously are modified in order to teach parent and adolescent how to ‘turn toward’ the other’s (rather than their own) expression of emotion, and to teach the parent how to ‘sit with’ their adolescent’s expressions of sadness, anxiety and anger. As in session 3, time is spent encouraging parents and adolescents to give feedback to each other about ways of turning toward that are helpful or not helpful. The therapist may need to coach parents and adolescents about helpful ways of turning toward the other, and remind them of what was identified as helpful in the previous session. Frequently the parent or adolescent may identify differences in what was helpful from the therapist, and what is helpful from each other. The therapist should normalise this (i.e., we may find ways of responding that were helpful at one time less helpful at another time depending on how we are feeling; we may find that what one person does to ‘turn toward’ or ‘sit with’ our feelings is not helpful when someone else does the same thing, because the relationship is different), encourage them to both find ways of responding to each other that fit for their relationship, and to accept that these may vary. The parent is additionally supported to maintain an awareness of whether their responses are being perceived by their adolescent as helpful or unhelpful, to experiment with different responses if necessary, and to be guided by their adolescent’s feedback.
From there, the therapist coaches the parent in ways of ‘sitting with’ their adolescent’s anger, anxiety and sadness, using strategies that were identified by the adolescent as helpful in session 3. As with the ‘turn toward’ exercises, the adolescent’s feedback is used to guide the parent’s strategies. Adolescents are additionally supported to talk to their parent about when they need to be left alone, rather than having the parent sit with their emotional expressions, and parents are encouraged to accept this and reflect on how they will regulate their own emotional responses if necessary.

Psycho--education about negative escalating cycles (NEC) of attack/defend and pursue/withdrawal is then introduced (Moed et al., 2014), demonstrated by the therapist with either the parent or adolescent using musical instruments. Parents and adolescents are asked to identify which NEC best characterises their conflict interaction. Musical exercises are then used to help parent and adolescent reflect on how they may recognise when they are in a NEC (e.g., body sensations, posture, volume or tempo, lack of turn taking), and to practise stopping the NEC. It is made clear that either parent or adolescent can stop the NEC, and that is important for the other to accept them doing this (i.e., when one stops during an attack/defend sequence, the other agrees to stop also).

From there, sequences of NEC – stop – self-regulate - turn toward are practised on musical instruments. Both parent and adolescent are supported to initiate interrupting the NEC, to use their previously identified emotion regulation strategy, then to turn toward the other. Discussion then focuses on what may make these skills hard to use during a conflict interaction (e.g., emotional flooding) and what may help parent and adolescent to use skills when they are discussing an issue that can cause conflict (e.g., an agreement to stop and use emotion regulation strategies as soon as either parent or adolescent identifies that a NEC is occurring). Finally, the parent is taught to add sitting with their adolescent’s emotional expression to the sequence outlined above.
Parents and adolescents are then asked to identify and stop NECs when they notice these at home, and to practise using emotion regulation strategies before turning toward and sitting with either after the NEC or at other times (here it is explained that the NEC does not have to be the first item in this sequence, and that where sequences begin with a parent’s recognition of and turning toward their adolescent’s emotional expression this may avoid a NEC developing).

3.3.5 Session 5: Individual meetings with parent and adolescent (tasks 1-3).

The first portion of session 5 (approximately 40 minutes) is with the parent alone. The goals of this session are 1) to check in how a parent feels therapy is progressing without the adolescent present in order to identify areas of difficulty that may require further attention, 2) to give further psycho-education specific to the parent rather than the adolescent (i.e., effects of parent’s childhood trauma experiences on parent-adolescent relationships; managing rejection), and 3) to prepare the parent to respond to adolescent’s verbal disclosure of feelings about issues causing conflict using the skills learned in previous sessions.

Frequently parents feel somewhat overwhelmed and frustrated with progress at this stage of therapy. It is important to reassure them that these feelings are normal because although skills have been learned and practised a little they are not yet consolidated. They may also be informed that they will have many more opportunities to practise these, to apply them to real conflict situations, and will learn the verbal equivalents to nonverbal skills taught in previous sessions. For parent-adolescent dyads where parents have a history of interpersonal trauma, reactive interaction patterns may have become habitual, embodied and automatic (Moed et al., 2014; van Ee et al., 2015). Awareness of these automatic patterns in order to interrupt them and learn new interactive cycles is an important first step, but it may take many repetitions before new patterns of response are consolidated.

Next, parents’ difficulties identified by the therapist as well as the parent during earlier sessions are now given more attention. The parent is given an opportunity in this
session to work on these further, and to discuss factors that may make skills difficult to put into practise that may not be related to the parent-adolescent relationship (i.e., lack of support from the other parent; other stresses). Where necessary, additional strategies or referrals may be given. Further psycho-education may address some of the difficulties raised by parents about the parent-adolescent relationship (e.g., information about adolescent emotional development may assist the parent to understand why their adolescent finds it difficult to calm down quickly after a NEC, and to accept that they may need to either give the adolescent more time or additional support via emotion coaching strategies, which are also revisited in greater detail during this session).

Preparing parents for their adolescent’s verbal expressions of emotion about conflict issues is important at this point, as the parent now has enough skills to understand what responses are required, and can rehearse these with the therapist before trying them with their adolescent. The therapist will configure this part of the session based on adolescent feedback from session 2. Where the adolescent has given permission to share information about their emotional experiences of parent-adolescent conflict interactions this information can be shared directly; where permission was not received this information can indirectly inform the way the therapist guides the parent. The therapist may prepare the parent gently using questions that encourage the parent to reflect on their adolescent’s emotional experience during conflict interaction (e.g., “I wonder how your adolescent feels when you raise this issue?”). The parent generally has some awareness of their adolescent’s emotional experience by this stage of therapy, as the adolescent has been asked in previous sessions to comment on how the parent’s representation of anger, anxiety or sadness on musical instruments makes them feel. TRM first teaches parents and adolescents emotionally regulated ways to discuss emotions without reference to conflict issues, before teaching skills that enable emotionally regulated communication about conflict issues. It is hoped that sequencing skills in this way will create a sense of confidence for both parent and adolescent that issues may be safely
raised and addressed constructively. This sequence is similar to the way managing conflict from an emotion coaching perspective is taught in the Tuning in to Teens parenting program. Parents are encouraged to manage their own strong feelings, and to assist their adolescent to manage their emotions where conflict is at a heightened level, before addressing the conflict issue (Havighurst et al., 2012).

Finally, the therapist informs the parent that remaining sessions will provide further scaffolding and skill building. Parents and adolescents will use skills learned in nonverbal communication sequences to interact about an issue that may cause conflict before applying these skills to verbal conflict interactions.

The second portion of session 5 is an individual meeting with the adolescent (approximately 20 minutes). The goal of this meeting is to check in with the adolescent without their parent present about how they feel therapy is progressing, in order to identify areas of difficulty that may require further attention, and to consult with the adolescent about which conflict issues they may be willing to discuss with their parent in subsequent sessions.

At this point in therapy, adolescents frequently express frustration that things have not consistently improved at home. As with the parent, the therapist should reassure the adolescent that skills have yet to be consolidated, that this session is the opportunity to clearly identify skills that are harder to master in order to work on them further, and that there will be more opportunities to practise these and apply them to nonverbal and verbal interaction about conflict issues.

This can lead into a discussion with the adolescent about what conflict issues they are willing to discuss with their parent in further sessions, and to nominate which issues may be most important to them. If the adolescent did not give permission in session 2 for the therapist to let their parent know about their emotional experiences of parent-adolescent conflict interactions, then this should be checked again at this point. If the adolescent is still not comfortable to disclose their experiences to their parent, the therapist then negotiates
other ways this material may be addressed (i.e., the therapist may role play being an adolescent during parent-adolescent interaction about an identified conflict issue, then ask the adolescent to comment on whether their experience is similar or different. By now the adolescent has had an experience of the therapist role playing an adolescent or a parent during exercises teaching emotional response skills, so this suggestion is generally acceptable). The therapist may also need to explore the adolescent’s concerns further, in order to ascertain what skills the parent may still need to acquire or consolidate, and/or to negotiate with the adolescent whether there is a feeling or issue that they deem to be of low or moderate intensity, that they are willing to disclose.

Finally, the therapist then informs the adolescent about the content of the remaining sessions. These may be explained in a similar way as with the parent above.

3.3.6 Session 6: Conjoint session (tasks 3-4).

After checking in with parent and adolescent, the outline of sessions 6-8 is briefly explained as involving a change of focus from acquisition of discrete skills to applying these skills in flexible combinations to real issues, and discussing issues verbally whilst maintaining an awareness of nonverbal skills previously taught. After warm-up exercises, parents and adolescents are asked to play sequences of NEC, stopping the NEC by ceasing to play on their musical instrument (either can do this), using emotional regulation strategies, turning toward and sitting with in different combinations (e.g., ‘turn toward’, loud or non-response, NEC, stopping the NEC, emotional regulation strategy) in order to demonstrate that conversations may not start with a NEC, but where these develop they can be recognised and moved out of using the steps previously learned.

Next, ‘softened start-up’ (Carrere & Gottman, 1999) is introduced as the last building block of ‘safe communication’ skills. ‘Softened start-up’ involves expressing feelings and needs about an issue without blaming, criticising or judging. Musical exercises that teach nonverbal elements of ‘softened start-up’ include using a quiet/slow-to moderate
volume/tempo on an instrument that makes a gentle rather than percussive sound. Musical exercises are then sequenced either as the first step of a discussion that does not lead to a NEC (e.g., ‘softened start-up’, ‘turn toward’, ‘sitting with’), or added on to a sequence that may have included a NEC (e.g., NEC, stop the NEC, emotion regulation strategy, ‘turn toward’, ‘sitting with’, ‘softened start-up’).

Parents and adolescents are then invited to nominate low-intensity issues where they may use a ‘softened-start-up’, and to represent these discussions nonverbally on musical instruments. Nonverbal discussions about real issues generate the need for parents and adolescents to creatively use the sequences they have been taught in varying combinations. This session focuses on giving them a number of issues on which to practise these, and to experience the need to move flexibly between different skills. For example, a parent may need to briefly stop and use their emotion/autonomic regulation skill when their adolescent plays loudly in response to their ‘softened start-up’; or a parent may experiment with how soon they can move from ‘sitting with’ their adolescent’s expression of emotion about an issue to a ‘softened start-up’ to re-address the issue.

The therapist then facilitates a discussion with the parent and adolescent about how to use these skills when interacting about issues at home, and to reflect on what may facilitate the use of these skills or make their use more difficult, thus providing a way to introduce further verbal ‘safe communication’ strategies where needed (i.e., checking with the other about when to discuss an issue; preparing to talk about a conflict issue by using emotion regulation strategies etc.). Similarly, verbal equivalents are also introduced for ‘softened start-up’ (i.e., using “I” instead of “you” statements), ‘turning toward’ (i.e., acknowledging the other person), ‘sitting with’ (i.e., reflective listening) and stopping NECs (i.e., “I just need a moment to calm down”).
Lastly, parents and adolescents are asked to practise verbal ‘softened start-up’ and ‘turn toward’ at home. They are additionally asked to remain mindful of their nonverbal communication as practised on musical instruments (volume, tempo, turn taking).

3.3.7 Session 7: Conjoint session (tasks 4-5).

Session 7 begins with further practise during warm-up and preliminary exercises of ‘softened start-up’, and sequences described in session 6. The primary goal of this session is to assist parents and adolescents to successfully make the transition from using skills they have mastered nonverbally into their verbal conflict discussions.

To achieve this, parents and adolescents are asked to identify a conflict issue of medium intensity that they are willing to focus on using the skills taught to date. Once they have chosen their issue, they are asked to represent it nonverbally on musical instruments using the sequences practised earlier, and are encouraged to move flexibly between the core components as previously outlined.

From there, parents and adolescents are reminded of the verbal components of ‘safe communication’ and emotion coaching skills, and elaborated where necessary (e.g., the importance of listening without judgement and/or using respectful language may need to be emphasised). The role of the therapist is to coach verbal and nonverbal skills, and to encourage parent and adolescent to maintain a dual awareness of the process as well as content of their conflict interaction (i.e., staying aware of techniques whilst focusing on the issue to be discussed). Where there is time, and the therapist deems that that parent-adolescent dyad has mastered skills sufficiently, this exercise may then be repeated with a higher intensity issue (determined by the dyad).

A further task for this session is to encourage parents and adolescents to consider how they will use these skills at home in situations that are less controlled than the therapy context (e.g., where other family members are present; where there are other pressing demands for attention and time) and to give further advice where needed (e.g., choose a place to have the
conflict discussion that is private, at a time where both parent and adolescent are able to give the discussion their full attention).

Frequently by this stage of therapy parents and adolescents are skilled at their nonverbal communication and emotional/autonomic regulation strategies, but are struggling to find the right words to clearly express their emotions and needs (adolescent) or to use verbal emotion coaching strategies (parent). This process should be normalised as per previous sessions (i.e., verbal skills are new and therefore have yet to be consolidated; give detailed feedback about what parent and adolescent are now doing well).

This session and the following session now begin to look much like ‘therapy as usual’ in that the focus has shifted to assisting the parent and adolescent to improve their verbal conflict communication. Psycho-education is given to the parent in this session about problem solving and setting limits, and the adolescent’s views about this material are actively sought and discussed.

Dyads are then informed that limit setting will be the focus of the final session, and this will be done collaboratively with the adolescent (i.e., the adolescent will be able to express their feelings and needs about the limit being set; the parent will be supported to respond sensitively to their adolescent’s emotions and needs, and to negotiate the limit under discussion where they feel this is appropriate). Parents with a history of interpersonal trauma may either set limits in an arbitrary and/or inconsistent way (Dubowitz et al., 2001), or experience emotional dysregulation in response to their adolescent’s resistance to limits (Pears & Capaldi, 2001), meaning that they may experience themselves as ineffective in establishing and maintaining a limit. In an attempt to then set limits effectively, parents may resort to punitive responses, or impose consequences in order to reinforce limits which may then escalate parent-adolescent conflict, rather than working through the limit via exploration of the adolescent’s feelings and needs (Dix, 1991). Therefore it is important to equip parents with assertive and flexible ways of setting limits that are effective as well as developmentally
appropriate to adolescent needs for some autonomy in decision making processes that affect them (Beveridge & Berg, 2007).

Finally, parents and adolescents are asked to notice opportunities to discuss issues that may cause conflict during the week. They are additionally asked to apply skills learned to their verbal discussions.

3.3.8 Session 8: Conjoint session (task 5).

After check-in re the homework task, parents and adolescents are invited to further discuss problem solving and limit setting, and key messages are reinforced (i.e., it’s necessary for parents to set limits sometimes; it’s important to give an adolescent some influence over how a limit may be imposed where possible; where this is not possible the parent should respond sensitively to an adolescent’s expression of emotion about the limit).

Warm up exercises with musical instruments comprise a game where nonverbal elements of limit setting are introduced, to illustrate that skills already learned can be applied (i.e., using ‘softened start-up’ to set a limit; the parent may use ‘turn toward’ when responding to their adolescent’s expression of frustration about the limit, the adolescent may use ‘turn toward’ in response to their parent’s ‘softened start-up’). Additional music exercises are then introduced that 1) teach the parent to maintain a non-reactive but consistent (assertive) response to the adolescent’s attempts to alter their instrument playing, and 2) teach the parent to respond flexibly to their adolescent’s attempts to influence their playing. A discussion is then facilitated where dyads are encouraged to think about where each response may be appropriate (i.e., where the parent should or should not respond flexibly to their adolescent’s view about a limit).

Dyads are then asked to select an issue that the parent has already attempted to set a limit with, that they are willing to work on in the session. Once the dyad has agreed on an issue, they are asked to verbally address it using the combination of nonverbal and verbal safe communication and emotion coaching strategies previously taught. The therapist’s role
is again to coach, and to assist parent and adolescent to maintain a dual awareness of their nonverbal process as well as the content of the issue that requires limit setting. Where appropriate, dyads are assisted to collaboratively negotiate limit setting using problem-solving strategies introduced in the previous session.

The final portion of session 8 comprises a review of the therapy process, and gives parent and adolescent an opportunity to reflect on gains made and further work still to be done. If dyads consider that they require further support to consolidate skills, referrals are given.
Chapter 4: Study 1. Review of Nonverbal Communication in Parent-Child Relationships: Assessment and Intervention

4.1 Abstract Study 1

Nonverbal processes are critical to parent-child communication, but are seldom the focus of therapeutic intervention once a child is over 12 months of age. This paper reviews the literature on nonverbal communication in parent-child interaction. We outline assessment tools and interventions designed to measure and improve nonverbal communication, identify gaps in publications describing existing practice, and discuss implications for further intervention research and development. We searched Medline and PsychInfo databases for theoretical and empirical articles that defined, conceptualised, measured and intervened with parent-child nonverbal interaction. Although we found a number of validated and reliable assessment measures, these were not routinely used to inform development of interventions that directly targeted nonverbal communication. Additionally, we identified very few interventions that met established criteria for evidence-based practice, which directly focused on nonverbal communication as a target for change. Interventions that were included in this review utilised play, creative arts mediums and psycho-education to work therapeutically with nonverbal processes. Given the importance of nonverbal communication for effective parenting and parent-child communication, we recommend that nonverbal communication is assessed and addressed explicitly as a core part of parent-child intervention, development and evaluation. Intervention development may additionally be informed by existing nonverbal assessment tools, many of which have established good reliability and validity, and therefore may assist with intervention as well as outcome measurement.
4.2 Introduction Study 1

Downcast eyes, hands on hips, or a stroke on the arm – these are just some of the ways parents and children communicate without words. Nonverbal communication (NVC) is critical to parent-child relationships, facilitates attachment, and functions to co-regulate emotion and behaviour (Schachner et al., 2005). Nonverbal cues give information about a child’s emotional intensity and nuance, and provide meaning and context (Mandal & Ambady, 2004). Although not routinely the focus of parents or professionals once a child begins to speak and understand language, nonverbal processes play a key role in how children learn and develop (Halberstadt, Parker, & Castro, 2013), as well as impacting their socialisation (Dunsmore et al., 2009). A vast body of literature from fields such as developmental, clinical, family and social psychology, psychobiology, and the social sciences more broadly attests to the important role of NVC in parent-infant relationships; however the evidence is much more limited about the influence of NVC after a child’s first year.

NVC skills, defined from a social information processing perspective as the ability to accurately send and receive nonverbal information, are essential for managing relationships (Nowicki & Duke, 2013). NVC includes facial expressions, gesture, and vocal tone (Boice & Monti, 1982). NVC skills are critical to social success and emotional wellbeing in all cultures (Scherer, Clark-Polner, & Mortillaro, 2011), and are linked to a range of developmental outcomes for children (Halberstadt et al., 2013).

In parent-child relationships, the way parents respond to their children’s expression of emotions influences how securely a child is attached to their parent, and can therefore affect a child’s relational experience and their experience of later adult relationships (Carton, Kessler, & Pape, 1999; Schachner et al., 2005). Children’s NVC skills are shaped by their parents’ responses through social referencing and observational learning (Eisenberg et al., 1998), modelling (Morris et al., 2007), and mirroring (Coan, Ambadar, & Ekman, 2007). Where parents respond consistently and sensitively to their child’s nonverbal cues, children are more
resilient (Savage-McGlynn et al., 2015), are assisted to regulate their emotional arousal
(Trehub, Hannon, & Schachner, 2010), develop an internal locus of control (Carton &
Carton, 1998), and learn how to effectively maintain relationships (Nowicki & Duke, 2013).
A mother’s touch and nonverbal vocalising stimulates the production of oxytocin and
engages neural systems that cue a sense of safety in children, assisting the development of
physiological regulation and social connectedness (Porges, 2001; Seltzer et al., 2010).

Children use NVC strategies to achieve relational, instrumental, pro-social and rule-
oriented goals in a range of social contexts, including their relationship with their parents
(Zeman & Shipman, 1998). Strategies may include altering facial expressions, or engaging in
activities to manage emotions (Dunsmore et al., 2009).

A parent’s ability to understand and respond to their child’s nonverbal cues, which
may communicate the need for support, signal relational distress, or function to activate
caregiving behaviour (Schachner et al., 2005), is essential to ensure parents can effectively
regulate their children’s affect, physiology and behaviour, protect them from threat, and
provide guidance about how to respond to environmental events (Pally, 2001).

Parents shape their children’s behaviour partly through NVC about what is acceptable
or unacceptable (Casey & Fuller, 1994); this is strengthened when verbal and nonverbal
messages are unambiguous and congruent. When nonverbal signals directly contradict verbal
messages, children may have difficulty recognising emotions, and their self-perception may
be negatively affected (Grebelsky-Lichtman, 2014). Parents’ dismissing or punitive responses
to children’s expression of negative emotions has been linked to children’s somatising
difficulties such as medically unexplained headaches etc. (Gilleland et al., 2009) that may
communicate nonverbally a child’s emotional state (Privitera, 2013).

Children rely on their parents’ ability to accurately interpret their emotions; where
this does not occur a child’s feelings may be falsified or negated (Crittenden, 2009). This
may affect a child’s capacity to clearly express emotional arousal, which is necessary so a
parent can gauge what level of support may be required (Trees, 2005). Children’s responses may additionally be shaped by their parents’ meta-emotion philosophy (beliefs about emotions), which may promote or inhibit expression of emotion necessary for the development of emotion regulation (Gottman et al., 1997). A parent’s sensitivity to their child’s NVC is important well beyond infancy, with studies showing that reciprocal nonverbal approach and avoidance behaviours are associated with shame and contempt in parent-adolescent relationships (Kahlbaugh & Haviland, 1994), and nonverbal communication of anger predicts poorer outcomes for parent-adolescent conflict (Eisenberg et al., 2008).

A parent may convey an understanding of their child’s emotional state nonverbally from birth, and this forms part of a capacity to mentalise, or reflect on a child’s state of mind (Fonagy & Target, 1997). When a parent is unable to do this, the child may experience a lack of integration between their internal and external experiences, resulting in a tendency to orient more to nonverbal bodily and physical cues rather than verbal cues to make sense of their interpersonal environment (ibid). For parents and children who require professional assistance as a consequence of these difficulties, it may be particularly important that intervention provides opportunities for nonverbal expression that may allow emotions to be shared and understood (Zilberstein, 2013).

Difficulties in NVC are intra and interpersonal, and they may impact parenting and child functioning. Identification of these difficulties, and how they may then shape the development of problems in parent-child interaction, is crucial for the development of effective therapeutic intervention. Parents’ difficulties with NVC may impact not only their general functioning, but also their parenting capacity. Empirical studies of factors influencing parental NVC have found that parents ability to be sensitive to their nonverbal cues may be negatively affected by adverse early experiences (Berenbaum, 1996), levels of marital conflict, meta-emotion philosophy (Gottman et al., 1997), vagal tone (Skowron et al., 2013),
and physical illness (Tulipani et al., 2010). Psychopathology may also affect a parent’s capacity to notice and sensitively respond to their child, with studies finding that mothers with Borderline Personality Disorder (Elliot et al., 2013), and parents deemed to be at high risk of abusing their child, who were also experiencing stress and depressive symptoms (Asla et al., 2011) having greater difficulties in accurately recognising their child’s nonverbal expression of emotions. Depression and anxiety are characterised by changes in voice frequency and motor expression of affect (Ellgring & Scherer, 1996) which may both reflect parental psychopathology and influence children’s responses through the social learning mechanisms described earlier. Parents with these challenges may give minimal or ambiguous nonverbal cues to their child (Crittenden, 2008). This may set in motion and entrench negative reciprocal cycles of interaction, with detrimental implications for open parent-child communication, and for the child’s social and emotional development (Ehrlich et al., 2015).

Alexithymia, meaning ‘no words for emotions’ (G. J. Taylor & Bagby, 2004) is a condition present in approximately 10% of the population, characterised by deficits of nonverbal emotion recognition and expression which create interpersonal problems (Spitzer, Siebel-Jurges, Barnow, Grabe, & Freyberger, 2005). Alexithymia has been associated with parenting difficulties, including parents’ ability to effectively respond to their children (Kliwerer et al., 2016), a tendency to overprotect and parent intrusively (Thorberg et al., 2011), and a reliance on dependency- and achievement-oriented strategies alongside authoritarian parenting (Cuzzocrea et al., 2015). Parents may draw on these strategies when they are either not able to accurately interpret the nonverbal behaviour of their child, or appreciate the impact of their own nonverbal responses on their child’s experience and behaviour (Bugental, 2005). Parents may not be able to model helpful ways of expressing emotions nonverbally, may demonstrate nonverbal and verbal responses to their child’s emotions that communicate disapproval or dismissiveness, and may not have the skills to teach their child about nonverbal as well as verbal cues that guide awareness and expression.
of emotions, with negative consequences for their child’s emotional competence (Eisenberg et al., 1998). Parents with these difficulties may require targeted interventions to help them develop skills in NVC.

Children may also experience difficulties in NVC. The parent-child relationship is the main environment where children’s NVC patterns are initially formed and subsequently reinforced. Children who have not learned effective ways to express their emotions nonverbally, and to accurately interpret the nonverbal expressions of others may be ill equipped to cope with the demands of social interaction (Schechter et al., 2006). Childhood psychopathology has been linked to problems with accurate interpretation of nonverbal cues (Magill-Evans et al., 1995). In one study, boys from a clinical population differed from a community sample in their ability to recognise and interpret other children’s nonverbal signals, suggesting that faulty nonverbal information processing may contribute to aggressive behaviour (Russell et al., 1993). Associations have been found between NVC processing deficits and depression (van Beek & Dubas, 2008) and social anxiety in children and adolescents (McClure & Nowicki, 2001).

NVC problems are further linked with children’s and adolescents’ mentalising difficulties as the result of either misunderstanding or missing nonverbal expressions of anger, for example (Sharp & Venta, 2012). These difficulties may also be associated with problems with emotion dysregulation, meaning that children may become driven by unhelpful cycles of interaction where repeated misunderstanding of the nonverbal cues of others generate a negative response from caregivers and peers. These may reinforce children’s aggressive and emotionally labile reactions, which may then lead to behavioural problems (Beauchaine et al., 2007). Exposure to traumatic events may shape children’s maladaptive nonverbal expression of and response to emotions where interpersonal environments incubate prolonged states of high negative emotional arousal, and where interactive repair is not provided by a caregiver (A. N. Schore, 2013). Persisting difficulties
using nonverbal as well as verbal communication in social contexts may additionally be understood from a neurodevelopmental perspective, classified as Social (Pragmatic) Communication Disorder (American Psychiatric Association, 2013); this is thought to co-occur with a number of behavioural disorders in children including Attention Deficit Hyperactivity Disorder and Conduct Disorder (Norbury, 2014). Children who experience these difficulties may therefore require targeted interventions helping them develop skills that will assist them to notice, understand and therefore accurately interpret the NVC of others, which may then assist them to respond differently. Interventions that work with children and their parents together may allow for skills to be learned within naturally occurring parent-child interactions.

In summary, NVC skills are of critical importance for healthy parent-child relationships, effective parenting, and children’s development. Difficulties in expressing and understanding nonverbal cues are associated with a range of problems that may affect parents’ and children’s wellbeing. While there is now considerable literature identifying the importance of NVC and how difficulties in NVC are related to poorer outcomes, there is less clarity about how best to assess these problems or intervene with them.

Therefore, this review aims to examine the literature in order to ascertain how NVC in the parent-child relationship needs to be considered in the years following infancy. To do this, we have reviewed the assessment and intervention literature on parent-child NVC. We detail the methodology used for conducting a review of the NVC assessment and intervention literature before presenting the findings. We then consider the different theoretical frameworks that inform this literature when identifying the gaps in existing interventions, and discuss the implications for further development and evaluation of NVC in intervention.
4.3 Method Study 1

4.3.1 Identification of source material.

In order to discover what assessment tools and interventions have been developed to assist parents and children with NVC, we conducted a review of the literature. We searched PsycINFO and Medline databases for theoretical and empirical articles that defined, conceptualised, measured and intervened with parent-child nonverbal interaction. We drew search term and keyword combinations (with Boolean connectors) from preliminary reading of the theoretical and empirical literature in order to focus the search to articles that met criteria for evidence-based practice as defined by the ‘Standards of Evidence’ guidelines developed by the Society for Prevention Research (Flay et al., 2005); these included parenting, parent-child relationships, nonverbal communication, assessment, and intervention. We identified a list of 417 relevant journal articles, books and dissertations. We then examined the reference lists of articles deemed relevant to this review to identify any additional articles that did not appear in the initial literature searches. We also examined research outcome studies and manuals describing established evidence-based parent-child interventions known to us, to determine whether NVC was addressed within a broader therapeutic framework. Following examination of the initial list, we selected 21 articles about observational assessment and 7 articles about intervention with nonverbal communication in parent-child relationships for inclusion (see Figure 2).
Initial database search $N = 25783$

Abstracts screened for relevance, $n = 25366$ excluded

Full text articles screened for eligibility $n = 417$

Articles excluded for not meeting inclusion criteria $n = 405$

Articles selected for inclusion $n = 12$

Additional records identified from other sources $n = 158$

Articles excluded for not meeting inclusion criteria $n = 142$

Articles selected for inclusion $n = 16$

Articles selected for inclusion $n = 28$

*Figure 2.* Flow diagram – identification and selection of articles.
4.3.2 Inclusion and exclusion criteria.

We selected only peer-reviewed, English-language articles for inclusion. Papers found were published between 1978 and 2016. The studies included were those examining NVC in parent-child interaction in assessment or intervention research that used measurement tools with reported reliability and/or validity information; we selected studies where both clinical and nonclinical samples were used, and with children from 12 months to 31 years. We excluded studies focusing on assessment and intervention with parents and children under 12 months.

Many disciplines have made an important contribution to understanding the role of NVC in parent-child relationships, and qualitative research plays a valuable role in the development of theory that may inform assessment and intervention. For the purposes of this review, however, we have chosen to include only literature describing theory and intervention outcomes that has been both shaped by and subjected to processes required to develop evidence-based practice as defined above (Flay et al., 2005), and excluded studies using only qualitative methodologies. Theories most frequently cited that met this criteria include attachment, emotion socialisation, family systems, social learning, social information processing and developmental theory. Other primary frameworks referenced include psychobiology, mindfulness, and resilience.

We excluded studies targeting populations where deficits in nonverbal communication were due to organic impairment that is unlikely to respond to interventions targeting parent-child interaction (e.g., severe hearing loss). We also excluded studies that targeted nonverbal elements of social functioning more broadly (e.g., Magill-Evans et al.’s (1995) Child and Adolescent Social Perception Measure which assesses young people’s sensitivity to NVC and how these skills correlate with popularity).

Studies selected that examined assessment of nonverbal communication. We considered a number of different research methodologies when reviewing assessment of
NVC. We included research that used observational measures in addition to parent-report and/or child-report (via questionnaires and/or interviews) to assess NVC. In addition, we selected articles using assessment methods that identified and systematically coded specific components of nonverbal behaviour (e.g., vocal pitch). We excluded methods that used broader observational parameters to describe nonverbal behaviour, due to lack of specific description of the NV behaviour being assessed (e.g., ‘parent withdrawal’ cf. ‘parent looks away from child’).

Table 2 provides an overview of research studies using observational assessment tools, and then the author/s who developed the assessment tool (in some cases the developer/s of the assessment tool has also conducted a research study, so the same reference is listed in both columns). The primary theoretical framework utilised by researchers (listed first) and assessment tool developers (listed second) is then noted, followed by a brief description of what is being assessed, the NVC behaviours used to inform assessment, and the study sample of interest. Reliability data are reported from either research studies (first column) and/or assessment tool development (where the same study appears in columns 1 and 2). Validity information is provided where the developer of the assessment tool has made this available. Assessment tools marked with an asterisk* refer to tools used to inform and/or measure effectiveness of interventions listed in table 3.
### Table 2  Overview of Studies of Nonverbal Assessment in Parent-Child Interaction

<table>
<thead>
<tr>
<th>Authors: study</th>
<th>Assessment tool/author</th>
<th>Theoretical model/s</th>
<th>What is assessed</th>
<th>Nonverbal behaviours</th>
<th>Study sample</th>
<th>Reliability/validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacobsen, 2012</td>
<td>* Assessment Parent-Child Interaction, Jacobsen ibid</td>
<td>Attachment theory</td>
<td>Parent-child interaction</td>
<td>Auditory cues (music), gesture, facial expression, vocal cues</td>
<td>18 parents at risk of abuse/ neglect; 34 nonclinical parents, children 5-12 years</td>
<td>Validity established; Inter-rater reliability (IRR) .73 -.89; Test-retest reliability (TRR) .70 -.89</td>
</tr>
<tr>
<td>Kahlbaugh &amp; Haviland, 1994</td>
<td>NV approach/avoidance balance behaviours Kahlbaugh ibid</td>
<td>Attachment theory</td>
<td>NV approach and avoidance behaviours in parent-child dyad</td>
<td>Facial expression, orientation, posture, gesture</td>
<td>30 parent-child dyads 7-16 years</td>
<td>All scales – α = .77-.86 IRR .91</td>
</tr>
<tr>
<td>Lemche et al., 2004</td>
<td>Strange Situation Ainsworth et al., 1979</td>
<td>Attachment theory</td>
<td>Effect of attachment on development of alexithymia</td>
<td>Movement, gesture and vocalisation</td>
<td>42 mothers and toddlers</td>
<td>IRR attachment classifications A, B, C .75; D .88</td>
</tr>
<tr>
<td>Authors: study</td>
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<tr>
<td>Ehrlich et al., 2015</td>
<td>Parent-Adolescent Conflict Coding Interaction System</td>
<td>Developmental theory</td>
<td>Discrepancy between self-report and observed conflict</td>
<td>Head nodding, voice level, eye contact, sighing, movement</td>
<td>189 16 year old girls and their parents</td>
<td>Intra-class correlation coefficients (ICC) &gt;.80</td>
</tr>
<tr>
<td>Ziv et al., 2002</td>
<td>Behavioural Measure of Adolescents’ Emotion</td>
<td>Developmental theory</td>
<td>Positive and negative affect in parent-adolescent conflict</td>
<td>Facial cues and expression, tone of voice, gesture, movement</td>
<td>162 adolescents 11-16 and their mothers</td>
<td>ICC .83 (T2), .88 (T3); + Affect mothers .93, teens .92; Anger: mothers .74, teens .71</td>
</tr>
<tr>
<td>Eisenberg et al., 2008</td>
<td>Behavioveal Measure of Adolescents’ Emotion</td>
<td>Developmental theory</td>
<td>Positive and negative affect in parent-adolescent conflict</td>
<td>Facial cues and expression, tone of voice, gesture, movement</td>
<td>162 adolescents 11-16 and their mothers</td>
<td>ICC .83 (T2), .88 (T3); + Affect mothers .93, teens .92; Anger: mothers .74, teens .71</td>
</tr>
<tr>
<td>Moed et al., 2014</td>
<td>Profile of Nonverbal Sensitivity (PONS)</td>
<td>Social development</td>
<td>Adult decoding skills related to experience of being parented</td>
<td>Vocal cues (audio decoding) at T2 and children 5 years, T2: 72 children 31 years</td>
<td>Internal consistency</td>
<td>audio PONS .68</td>
</tr>
<tr>
<td>Hodgins &amp; Koestner, 1993</td>
<td>Profile of Nonverbal Sensitivity (PONS)</td>
<td>Social development</td>
<td>Adult decoding skills related to experience of being parented</td>
<td>Vocal cues (audio decoding) at T2 and children 5 years, T2: 72 children 31 years</td>
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<tr>
<td>Dunsmore et al., 2009</td>
<td>Diagnostic Analysis of Nonverbal Behaviour (DANVA-2) Nowicki &amp; Duke, 1994</td>
<td>Emotion</td>
<td>Children’s recognition of parents’ emotions</td>
<td>Facial expression</td>
<td>40 parents and children 9-10 years</td>
<td>Test-retest reliability for child subscale .74</td>
</tr>
<tr>
<td>Schechter et al., 2014</td>
<td>CARE Index</td>
<td>Emotion</td>
<td>Maternal sensitivity to child’s emotional communication</td>
<td>Facial and vocal contact, turn taking</td>
<td>60 mothers with PTSD, children 12-42 months</td>
<td>Validity established, IRR .86</td>
</tr>
<tr>
<td>Katz &amp; Gottman, 1995</td>
<td>Specific Affect Coding System (SPAFF) Gottman &amp; Grokoff, 1989</td>
<td>Vagal tone</td>
<td>Parent-child and couple interaction</td>
<td>Facial expression, voice pitch, volume and tempo, posture, gesture</td>
<td>56 families with children 5 and 8 years</td>
<td>IRR .86-.97</td>
</tr>
<tr>
<td>Main &amp; Cassidy, 1988</td>
<td>Attachment Classification System, Main ibid.</td>
<td>Attachment theory</td>
<td>6 year old children’s responses to reunion with parent</td>
<td>Proximity seeking Physical contact Body orientation</td>
<td>(1) 40 and (2) 50 children 6 years and their mothers</td>
<td>Validity established; IRR .62-.92 across both studies</td>
</tr>
<tr>
<td>Authors: study</td>
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<tr>
<td>Teti et al., 1995</td>
<td>Preschool Assessment of Attachment</td>
<td>Attachment theory</td>
<td>Maternal depression and child’s attachment</td>
<td>Movement</td>
<td>54 parent-preschool child dyads</td>
<td>Validity established; IRR .77-.99</td>
</tr>
<tr>
<td>Crittenden, 1992</td>
<td>Attachment Q-Sort</td>
<td>Attachment theory</td>
<td>Children’s security, dependency and sociability</td>
<td>Proximity seeking, crying, laughing, movement</td>
<td>58 children 12 and 18 months</td>
<td>Validity established; IRR .58 -.73</td>
</tr>
<tr>
<td>Vaughn &amp; Waters, 1990</td>
<td>Waters &amp; Deane 1985</td>
<td>Attachment theory</td>
<td>Parent’s provision of structure, challenge, nurture and engagement</td>
<td>Eye contact, Physical interaction</td>
<td>15 adolescent-mother dyads; 16 adult-child dyads</td>
<td>Validity established; IRR .82; ICC .73 - .79</td>
</tr>
<tr>
<td>Hitchcock et al., 2008</td>
<td>* Marschak Interaction Method Rating Scale</td>
<td>Attachment theory</td>
<td>Verbal and nonverbal congruence in parent-child interaction</td>
<td>Facial expression</td>
<td>80 parents and children 4 years</td>
<td>Validity established; IRR .88 - .93 across both measures</td>
</tr>
<tr>
<td>Grebelsky- Lichtman, 2014</td>
<td>Facial Action Coding System (FACS)</td>
<td>Action assembly theory</td>
<td>Psychobiological theories</td>
<td>Facial expression</td>
<td>80 parents and children 4 years</td>
<td>Validity established; IRR .88 - .93 across both measures</td>
</tr>
<tr>
<td>Ekman &amp; Friesen, 1978</td>
<td>Kestenberg Movement Profile (KMP)</td>
<td>Developmental theory</td>
<td>Posture</td>
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<tr>
<td>Authors: study</td>
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<td>Savage-McGlynn et al., 2015</td>
<td>Home Observation for Measurement of the Environment (HOME)</td>
<td>Resilience</td>
<td>Children’s resilience</td>
<td>Movement, gesture, facial/vocal expression</td>
<td>6,500 mothers with PND and children 8 months/ 11 years</td>
<td>Validity established; IRR – 80% - 90%; internal consistency .44 - .89 across multiple studies (Totsika &amp; Sylva 2004)</td>
</tr>
<tr>
<td>Caldwell &amp; Bradley, 1984</td>
<td></td>
<td>Bio-psychosocial development</td>
<td>where mother has post-natal depression (PND)</td>
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<td></td>
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<tr>
<td>Peterson et al., 2007</td>
<td>Video-recorded coding of interpersonal distance and touch, Peterson et al ibid</td>
<td>Social support</td>
<td>Parents’ interpersonal distance and touch behaviour in children</td>
<td>Interpersonal space, distance and touch behaviours</td>
<td>Parents and children 3-12 years</td>
<td>Construct validity established, IRR .75 - .83</td>
</tr>
<tr>
<td>Trees, 2005</td>
<td>Facial Action Coding System</td>
<td>Systems theory</td>
<td>Support-seeking in adult children and their parents</td>
<td>Facial expression</td>
<td>77 mothers and their children 17-29 years</td>
<td>Validity established; IRR .68 - .89</td>
</tr>
<tr>
<td>Ekman &amp; Friesen, 1978</td>
<td></td>
<td>Psychobiological theories informing emotion research</td>
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<tr>
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<tr>
<td>Lindahl &amp; Malik, 2000</td>
<td>System for Coding Interactions and Family Functioning (SCIFF) Lindahl &amp; Malik ibid</td>
<td>Family systems and social learning theories</td>
<td>Family interaction</td>
<td>Interpersonal space, facial expression, tone of voice</td>
<td>60 families</td>
<td>IRR .59 - .92</td>
</tr>
<tr>
<td>Duncan, Coatsworth et al., 2015</td>
<td>Iowa Family Interaction Rating Scales (IFIRS)</td>
<td>Mindfulness Family systems</td>
<td>Congruence between self-report and observed parent-child interaction</td>
<td>Use of silence, smiles, hugs, pauses in discussion, body position</td>
<td>375 mothers and their year 7 children</td>
<td>Validity established; IRR .42 - .73; ICC .38 - .83</td>
</tr>
</tbody>
</table>

Note: * refers to tools used to inform and/or measure effectiveness of interventions listed in table 3
Studies selected that examined interventions with nonverbal communication. A small number of articles that empirically tested interventions to assist parents and children with their NVC utilised randomised control trials with longitudinal follow-up data. We found few studies that met ‘gold standard’ criteria as described by the Society for Prevention Research that defines the conditions by which an intervention has established research confirming efficacy, effectiveness or dissemination (Flay et al., 2005).

We included intervention studies that addressed nonverbal behaviour, and that used individual and group modalities of delivery. As psycho-education has been shown to be of critical importance for parents who have difficulty decoding NVC (Kliewer et al., 2016), we included parent psycho-education programs where goals included the enhancement of NVC in parent-child relationships ($n = 3$). We excluded parent-child interventions that did not specifically state they addressed NVC in publicly available research studies and manuals, interventions that assessed but did not address nonverbal parent-child interaction, and interventions that addressed NVC but were not subject to empirical evaluation. Two sections now follow; the first on assessment of parent-child NVC, and the second on interventions that improve parent-child NVC.

4.4 Results Study 1

4.4.1 Assessment of nonverbal communication in parent-child relationships.

Identification of the importance of NVC in parent-child interaction has led to the development of tools for clinical assessment of parent-child NVC. The most widely used assessments for parents with conditions affecting NVC such as alexithymia were self-report questionnaires e.g., the Toronto Alexithymia Scale - TAS-20 (Bagby, Parker, & Taylor, 1994; Thorberg et al., 2011). These measures unfortunately rely on capacities that people with this condition find most difficult, namely recognition of internal states and reflective functioning (G. J. Taylor & Bagby, 2004). A summary of four decades of research on alexithymia has identified the need for the development of additional measures, including
observational assessment of NVC that can inform accurate diagnosis as well as direct effective treatment (Samur et al., 2013). The following review examines primarily observational assessment tools that are used in addition to parent and/or child-report to measure NVC in parent-child relationships. We have considered each of these in relation to the specific nonverbal behaviours of interest, the theoretical frameworks utilised and the contribution of these to what is being assessed.

**Description of included studies.** The 21 studies included seven reports of use of measures with clinical samples and testing of reliability and validity of the measures; the remainder (n = 14) were a small sample of studies, each representing a different NVC assessment tool, that utilised nonverbal observational and self-report measures to examine relations between NVC and other variables using a variety of study designs including correlational and comparison research studies, baseline data collected as part of randomised controlled trials (RCTs), and longitudinal studies. Observational measures were more likely to be used as a primary source of assessment information with preschool children, and where the need for observation was identified as critical for accuracy (and self-report was more likely to be problematic) – for example, discrepancy between observed and stated levels of conflict between parents and adolescents (Ehrlich et al., 2015). Studies used nonclinical populations (n = 14) or clinical populations including parents at risk of abusing their children (n = 3), or parents diagnosed with Alexithymia (n = 1), Posttraumatic Stress Disorder (n = 1), or Post-Natal Depression (n = 3).

**Nonverbal communication behaviours: what is being assessed?** NVC behaviours that are often of interest include movement, facial expression, posture, gesture, voice quality and tone, sense of timing, interpersonal distance, touch, and more (Boice & Monti, 1982). Two of the studies reviewed used facial expression data only (Dunsmore et al., 2009; Trees, 2005), meaning that they may have overlooked a large amount of nonverbal behavioural information. The remaining studies examined vocal volume, pitch and tempo (Ehrlich et al.,
The above-listed NVC behaviours were assessed in order to determine whether a parent was able to accurately recognise what emotions their child was communicating through auditory and visual cues, gesture and movement (Schechter et al., 2014). Children’s ability to recognise their parents’ facial expression of emotions was examined in relation to parents’ beliefs about emotions and how this translated to masking of emotional expression (Dunsmore et al., 2009). One study examined parents’ responses to their toddlers’ vocalising and gestures to determine whether this gave information about the correlation with attachment status and Alexithymia (Lemche, Klann-Delius, Koch, & Joraschky, 2004).

Studies looked at the effects of parents’ nonverbal behaviour on children’s coping and functioning; for example one study measured voice pitch, volume and tempo, gesture and posture, and facial expression to determine levels of parents’ hostility while fighting with each other when assessing how these behaviours may affect their children (Katz & Gottman, 1995). In another study, children’s resilience was assessed based on their capacity to indicate a need for proximity to their parent by observing their posture and gestures (Savage-McGlynn et al., 2015). Behaviours such as head nodding and sighing were observed in order to explore congruence between verbal and nonverbal parent and adolescent reports of conflict.
in their relationship in one study (Ehrlich et al., 2015), and facial expression, vocal tone, posture, gesture and movement were assessed to give information in addition to verbal content about the intensity, duration and nature of parent-child conflict in four studies (Duncan et al., 2015; Eisenberg et al., 2008; Kahlbaugh & Haviland, 1994; Moed et al., 2014).

**Theoretical frameworks.** The literature we reviewed drew on a range of theoretical frameworks to consider the function of NVC in parent-child interaction. Table 2 outlines the primary theoretical framework referenced in each article and assessment tool. The assessment foci of the different studies we reviewed were dependent on the theoretical frameworks informing the enquiry – for example a social information processing theory-informed study stated it was measuring ‘parental cooperation’ (Grebelsky-Lichtman, 2014), whereas ‘parental sensitivity’ was assessed in a paper citing emotion socialisation theory (Schechter et al., 2014). Such differences highlight the importance of articulating underlying theoretical positions about the purpose of NVC, which may then inform how it is observed and assessed.

**Attachment, developmental and emotion socialisation theories.** Studies citing attachment theory focused on parental sensitivity to their child’s emotional cues (S. Jacobsen, 2012), examined whether nonverbal approach and avoidance behaviours affected the quality of parent-adolescent interaction (Kahlbaugh & Haviland, 1994), and explored whether insecure attachment was related to children’s development of Alexithymia (Lemche et al., 2004). Studies primarily informed by developmental theory were concerned with the role of NVC in parent-adolescent conflict (Ehrlich et al., 2015; Eisenberg et al., 2008; Moed et al., 2014), and adults’ ability to decode nonverbal cues related to their early experiences of being parented (Hodgins & Koestner, 1993). Studies drawing on emotion socialisation theory were interested in emotion recognition and sensitivity to emotion – i.e., children’s recognition of their parent’s nonverbal expression of emotions (Dunsmore et al., 2009), and mothers’ sensitivity to their child’s emotional communication (Schechter et al., 2014). Studies were
also interested in children’s wellbeing when exposed to marital conflict (Katz & Gottman, 1995).

Several assessment tools were informed by attachment theory; these included Ainsworth’s Strange Situation (Ainsworth et al., 1979), the Attachment Classification System (Main & Cassidy, 1988), the Preschool Assessment of Attachment (Crittenden, 1992) and the Attachment Q-Sort (Waters & Deane, 1985). These measures observe a child’s nonverbal behaviours of movement and vocalisation to determine whether they seek or avoid proximity and comfort with their parent in order to assess attachment status. Measures used to capture this also included the CARE index (Crittenden, 2006a) that was developed to assess a child’s attachment to their caregiver by noting a child’s facial and vocal expressions, amount of body contact with their parent, the way the child physically positions their body in relation to their parent, and the extent to which a parent is able to understand their child’s gestures to inform turn taking games. Jacobsen’s Assessment of Parent-Child Interaction - APCI (S. Jacobsen, 2012) assessed parents with children 5-12 years, and observed how both child and parent used gestures, visual and auditory cues to interact while playing music games. These target nonverbal interactional processes such as parental attunement and emotional support in order to observe the way early attachment processes may affect current relating, and have been used to inform a clinical music therapy intervention for parents at risk of emotional abuse or neglect and their children 5-12 years (S. Jacobsen et al., 2014). The Marschak Interaction Method (O’Connor, Ammen, Hitchcock, & Backman, 2001) observed parent nonverbal behaviours such as eye contact and physical interaction to assess their capacity to nurture, engage, provide structure and opportunities for learning for their child. This measure guides treatment through Theraplay, a play therapy for parents and their children 2-7 years (Bojanowski & Ammen, 2011).

Assessment tools using a primarily developmental lens included the Kestenberg Movement Profile (Kestenberg, Loman, Lewis, & Sossin, 1996), Eisenberg’s Behavioural
Measure of Adolescent’s Emotion (Eisenberg et al., 2008), the Profile of Nonverbal Sensitivity (PONS) (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979), and Caldwell and Bradley’s Home Observation for Measurement of the Environment (HOME) (Caldwell & Bradley, 1984). These measures observe children’s and parents’ NVC to determine whether posture, facial expression, tone of voice or gesture may indicate intensity of emotional distress, levels of conflict and parental nonverbal sensitivity, in order to assess potentially negative implications for children’s development that may require intervention (Totsika & Sylva, 2004).

Assessment tools informed by emotion socialisation theory included Gottman and Grokoff’s Specific Affect Coding System (SPAFF) (Gottman & Krokoff, 1989), which codes nonverbal vocal qualities including volume, tempo and pitch as well as facial expression, posture and gesture to determine the nature and intensity of interpersonal conflict. Although initially developed for use with distressed couples, more recent research has utilised the SPAFF for assessment of parent-child interaction and parent-adolescent conflict (Coan & Gottman, 2007; Hollenstein & Lewis, 2006). Gottman has made extensive use of information about nonverbal parent-child processes to inform the development of emotion coaching, a framework which aims to explore the relationships between these aspects of the parent-child relationship (and parenting) and children’s emotional competence (Gottman et al., 1996).

*Social learning, social information processing and family systems theories.* Studies and assessment tools informed primarily by social learning, social information processing and family systems theories measured topics such as parents’ recognition of their children’s emotions (Nowicki & Duke, 1994), parent’s interpersonal distance and touch behaviour when supporting their child to have painful oncology procedures (Peterson et al., 2007), support seeking (Trees, 2005) and verbal and nonverbal congruence in parent-child interaction (Grebelsky-Lichtman, 2014). Assessment tools focused on problematic non-verbal elements of parent and child behaviours that may become the target for therapeutic intervention, such
as parental facial expressions, vocal cues and body language signalling rejection or withdrawal, or children’s nonverbal expressions of opposition or defiance (Eyberg, Nelson, Duke, & Boggs, 1981; Lindahl & Malik, 2000). Eyberg’s Dyadic Parent-Child Interaction Coding System (Eyberg et al., 1981) used a behavioural coding method to identify children’s nonverbal as well as verbal expressions of both positive and negative affect, and parents’ tone of voice and physical touch as well as statements used to convey praise, enthusiasm and encouragement, or conversely inflict pain or be experienced by the child as intrusive. Children’s (nonverbal) actions in response to their parent’s indirect (verbal) commands were also coded. These were used to assess the quality of parent-child social interaction, provide a baseline pre-treatment assessment of behaviours that may require intervention, and measure therapy progress and outcome. Lindahl and Malik’s System for Coding Interactions and Family Functioning (SCIFF) (Lindahl & Malik, 2000) assessed families’ behaviour when they disagree, in order to inform family therapy intervention. The SCIFF observed negativity and conflict by measuring tone of voice, negative facial expressions including eye rolling or frowning, and body position including crossed arms and fidgeting. These were also used to evaluate the emotional climate and cohesiveness of family interaction. The tool was designed to capture family interaction more broadly, rather than dyadic or individual behaviour.

Other frameworks. Other frameworks informing assessment of the nonverbal aspects of parent-child communication included psychobiology, mindfulness, and resilience. Studies looked at the effect of vagal tone on a child’s nonverbal behaviour in response to parental conflict (Katz & Gottman, 1995); the effectiveness of mindfulness training on parents’ ability to read their children’s nonverbal communication (Duncan et al., 2015); and a child’s capacity to communicate nonverbally at 15 months of age where the parent was diagnosed with post-natal depression (Savage-McGlynn et al., 2015). Many different studies, using a range of different theoretical perspectives, assess NVC because these skills are seen as being
central to different aspects of functioning, and are therefore amenable to intervention or change.

4.4.2 Interventions for improving nonverbal communication in parent-child interaction.

Evidence-based approaches to intervention that aim to improve parent-child relationships tend to focus on the verbal aspects of the relationship and work this way therapeutically, for example in systemic family work (Heatherington, Friedlander, Diamond, Escudero, & Pinsof, 2014). Approaches included in this review also focus on NVC, in order to improve functioning. The following studies include interventions that either directly address NVC in order to improve parent-child relationships, or attend to nonverbal processes as part of the overall intervention package.

Although programs for parents and their children may utilise assessment of nonverbal domains of parent-child interaction to both inform intervention and measure outcomes, NVC is not routinely targeted for change, with the exception of interventions for parents of pre-verbal children (Lieberman et al., 2005). Descriptions of strategies for both parents and therapists may assume rather than clearly spell out that NVC should be attended to; or imply that because nonverbal processes are deemed automatic, they are therefore not amenable to therapeutic change in their own right, except as an adjunct to working on verbal strategies. Examples include therapists instructing parents to imitate their child’s play, and to use positive affect while doing so (Greco, Sorrell, & McNeil, 2001), or the therapist is directed to model appropriate (nonverbal) cues and responses with the child for the benefit of the parent (Lieberman & Van Horn, 2008).

Where nonverbal strategies are clearly articulated, parents are instructed to modify their awareness of or response to their child’s NVC, for example “Often it can be enough to listen quietly or respond non-verbally” (Havighurst et al., 2012). However, for parents who may lack NVC skills, assistance may be required. We consider each of the following studies
in relationship to the specific nonverbal behaviours targeted for intervention, the theoretical frameworks utilised, how parents are assisted to develop NVC skills, intervention outcomes, and to what extent evidence to support the intervention has been established.

Table 3 provides an overview of interventions that directly address NVC in parent-child relationships, and of interventions that attend to NVC as part of a broader therapeutic approach. First, the intervention name and type of intervention is listed, then in the second column the author/s of the intervention and RCT/longitudinal studies conducted. The clinical sample that the intervention is designed to assist is briefly described, then the primary theoretical frameworks are listed. Next, NVC modalities targeted for change and how NVC is addressed are summarised, followed by intervention outcomes. Finally in the far right column of the table, a summary of RCTs and longitudinal studies conducted to test the intervention’s efficacy is included.

**Description of included studies.** We included studies in this review of interventions with a focus on NVC where nonverbal behaviour was addressed either as part of a verbally-focused intervention ($n = 5$) – for example, where the facilitator was instructed to model affect mirroring in a Mindful Parenting program (Duncan et al., 2009), or more specifically ($n = 2$) – for example, where the therapist provided structured activities for parent and child that promote acquisition of NVC skills (Jernberg & Booth, 2001). We included only studies subject to empirical evaluation with quantitative data on outcomes (see table 3). Interventions were with both individual and group parent-child dyads. Because we found so few empirically validated interventions that directly address nonverbal processes in parent-child interaction, and because psycho-education has been shown to be helpful for parents who have difficulty decoding NVC (Kliewer et al., 2016), we broadened our criteria to include parent psycho-education programs where goals included the enhancement of NVC in parent-child relationships ($n = 3$).
Selected intervention studies focused on nonclinical populations \((n = 4)\), parents and children at risk of marginalisation or abuse \((n = 2)\), children exposed to family violence \((n = 1)\), children with behavioural problems \((n = 2)\) and parents diagnosed with Borderline Personality Disorder \((n = 1)\). Three interventions could be modified for use with children of all ages, three were targeted at parents with young children, one was developed for parents and children 5-12 years, and one was specifically developed for parents and their adolescent children.

*Interventions directly targeting parent-child nonverbal communication.* Two interventions (S. Jacobsen et al., 2014; Jernberg & Booth, 2001) directly targeted parent-child NVC, both designed for use with single parent-child dyads. Both drew on attachment theory and developmental theory to inform play and music therapy approaches; these frameworks support goals of teaching parents how to understand gesture, touch, nonverbal vocal cues, and facial expression as information about a child’s experience, emotional state or intention, or to use these to effectively respond to their child.

Jacobsen’s music therapy intervention uses a mix of therapist- and client-directed musical activities such as structured games to help parents at risk of abuse or neglect interact appropriately with their child \((5 - 12\) years). The intervention aims to enhance NVC in order to improve parental attunement to their child, the child’s autonomy, and the child’s attachment status (S. Jacobsen et al., 2014). An RCT compared parent-child music therapy sessions \((n = 9)\) with treatment as usual \((n = 9)\), and found the music therapy condition resulted in significantly higher parenting competencies, positive parent-child interaction and reduced parental stress compared with the treatment-as-usual group. Strengths of this approach included the use of music to directly address parent-child NVC; limitations include the small sample size and limits to replicability, the therapy has not yet been manualised, and only music therapists are able to deliver the intervention.
### Interventions Targeting Parent-Child Nonverbal Communication

**Interventions directly addressing nonverbal communication (NVC)**

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Author/s</th>
<th>Sample</th>
<th>Theory</th>
<th>NV modalities targeted</th>
<th>How NVC is addressed</th>
<th>Outcomes</th>
<th>Empirical evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music therapy *</td>
<td>Jacobsen et al., 2014</td>
<td>18 parents at risk of emotional abuse/neglect, children 5-12 years</td>
<td>Attachment, Developmental</td>
<td>Aural, gestural, facial, expression</td>
<td>Music games, turn taking, lead/follow</td>
<td>Improved parent attunement, child communication</td>
<td>1 RCT conducted (n=18), significant changes on outcome variables</td>
</tr>
<tr>
<td>Theraplay*</td>
<td>Jernberg &amp; Booth, 2001; Siu 2009/14; Wettig et al., 2011</td>
<td>Parents and children 2-7 years with behavioural and/or developmental problems</td>
<td>Attachment, Movement, gesture, theory</td>
<td>Vocalisation, facial expression</td>
<td>Play activities that promote parental engagement, nurturing, structure and challenge</td>
<td>Improved attachment status, enhanced developmental outcomes</td>
<td>2 RCTs (n=38; 46); 1 longitudinal study (n=22), significant changes on outcome variables</td>
</tr>
</tbody>
</table>

### Interventions that attend to nonverbal communication as part of a broader therapeutic approach

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Author/s</th>
<th>Sample</th>
<th>Theory</th>
<th>NV modalities targeted</th>
<th>How NVC is addressed</th>
<th>Outcomes</th>
<th>Empirical evidence</th>
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<tbody>
<tr>
<td>Child-Parent Psychotherapy</td>
<td>Lieberman &amp; Van Horn, 2005</td>
<td>Parents and children up to 6 years exposed to family violence</td>
<td>Developmental, Social learning</td>
<td>Parent response to child’s crying, tantrums, proximity seeking and aggressive behaviour</td>
<td>Modelling, verbal interpretation of nonverbal processes, play, touch</td>
<td>Re-establishment of trust in body showed significant changes on outcome reciprocity, improved emotion regulation</td>
<td>2 RCTs (n=100; 76)</td>
</tr>
<tr>
<td>Intervention</td>
<td>Author(s)</td>
<td>Sample</td>
<td>Theory</td>
<td>NV modalities targeted</td>
<td>How NVC is addressed</td>
<td>Outcomes</td>
<td>Empirical evidence</td>
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<tr>
<td><strong>Mentalisation-Based Treatment</strong> (MBT) Group/ dyadic therapy</td>
<td>Bateman &amp; Fonagy 2009</td>
<td>Parents with Borderline Personality</td>
<td>Mentalisation</td>
<td>Parent responsiveness to child’s crying and behaviour</td>
<td>Modelling of containment, affect mirroring, verbal reflection</td>
<td>Improved parent capacity to think about child’s internal states and intentions</td>
<td>RCT (n=134) shown MBT is effective for BPD; not yet conducted for parent intervention</td>
</tr>
<tr>
<td>Mindful Parenting</td>
<td>Dawe &amp; Harnett, 2007; Coatsworth et al 2010; 2015</td>
<td>Non-clinical, children of all ages</td>
<td>Mindfulness</td>
<td>Parental sensitivity to child’s vocal, facial, movement expression of meaning/needs</td>
<td>Psycho-education includes teaching parent nonjudgmental acceptance, awareness, emotion regulation empathy for self/child</td>
<td>Improved parenting, parent-child affection, increased emotion regulation on outcome</td>
<td>3 RCTs (n=64; 65; 432) showed significant changes on outcome variables</td>
</tr>
<tr>
<td>Tuning in to Kids/Teens Parent education group</td>
<td>Havighurst et al 2010/13/14; Wilson et al, 2012; Kehoe et al., 2013</td>
<td>Parents of children 4-18 years</td>
<td>Emotion</td>
<td>Parent’s response to child’s proximity seeking and behavioural expression of emotion</td>
<td>Psycho-education includes identifying NVC of emotion, use of NV response to help child’s emotions</td>
<td>Improved parent awareness of and response to child’s emotions and needs changes on outcome variables</td>
<td>5 RCTs (n=216, 54; 204; 128; 225) have shown significant changes on outcome variables</td>
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</table>

*Note. * refers to interventions informed by assessment tools listed in table 2
Theraplay (Jernberg & Booth, 2001) employs a series of sequential and developmentally sensitive interactive play activities to help parents who are struggling to positively interact with their children (2 - 7 years) to communicate safety and trust, establish connection, transmit positive affect, and to assist emotional co-regulation using nonverbal elements of play such as positive touch. Goals include improved developmental outcomes for the child and improved parent-child attachment. Two RCTs found significant outcomes for 23 children with internalising symptoms 7-9 years (Siu, 2009) and improved social communication for 23 children with developmental disabilities (Siu, 2014) compared with matched control groups, and an uncontrolled study found improved assertiveness, self-confidence and trust, expressive and expressive communication and reduced social withdrawal for 22 children diagnosed with language disorders and social anxiety, with gains maintained at 2-year follow-up (Wettig, Coleman, & Geider, 2011). Strengths of this intervention are its focus on NVC using play; limitations include that it has yet to be empirically tested with children under 6 years and nonclinical samples.

**Interventions that target parent-child nonverbal communication as part of an overall approach.** We found five interventions that attend to parent-child NVC indirectly, rather than targeting NVC as an independent goal. Two are designed for use with individual dyads (Lieberman & Van Horn, 2005; Nijssens et al., 2012), and three are parent education groups entitled Mindful Parenting (Duncan et al., 2009), Tuning in to Kids (Havighurst & Harley, 2007) and Tuning in to Teens (Havighurst et al., 2012).

Child-Parent Psychotherapy (Lieberman & Van Horn, 2005) is an intervention that integrates psychodynamic, attachment, trauma, cognitive-behavioural and social learning theories to help parents and their preschool children restore their relationship, and improve children’s wellbeing after the experience of family violence. NVC is addressed by use of
positive touch to re-establish trust in bodily sensations, and play is utilised to integrate children’s affect with their narrative about traumatic experiences. Two RCTs have been conducted, finding 34 children had reduced anxiety, avoidance, resistance and anger and higher partnership with their mother post-intervention (Lieberman et al., 1991), and 38 preschoolers (Lieberman et al., 2005) had reduced symptoms of posttraumatic stress and behavioural problems post-intervention compared with controls. Strengths include use of modelling of NVC to assist attuned parent-child interaction; limitations are that intervention has focused on parents and young children only.

The Mindful Parenting program addresses NVC from a mindfulness theoretical framework, where paying attention to nonverbal processes appears to arise naturally from a non-judgmental and close focus on the moment-to-moment experience of parent-child interaction (Duncan et al., 2009). Psycho-education is used to stress to parents the importance of NVC when conveying awareness, acceptance of and empathy toward their child’s emotion. Three RCTs were conducted, and found significant reductions in rigid parenting attitudes, child abuse potential and child behavioural problems in 32 methadone-maintained parents who received a brief intervention compared with a control group (Dawe & Harnett, 2007), and improvements in child and youth functioning, parent-child relationship quality and parent wellbeing for fathers and mothers comparable to other parenting programs (Coatsworth, Duncan, Greenberg, & Nix, 2010; Coatsworth et al., 2015). Strengths of this intervention include the use of psycho-education to improve parental awareness of and response to their child’s NVC; limitations include that effects were not always positive (e.g., young people reported negative effects in their fathers’ listening, self-regulation and awareness of emotions in Coatsworth et al’s 2015 study).

The Tuning in to Kids and Tuning in to Teens parenting programs are informed by emotion socialisation, and translate Gottman’s Emotion Coaching framework to psycho-education for parents of children (Kehoe, Havighurst, & Harley, 2013) 4-18 years. The
program teaches parents how to coach emotions to help their child learn to regulate emotion (Gottman et al., 1997), and addresses NVC by raising parents’ awareness of both what their child is conveying behaviourally about their emotions (e.g., via ‘bids for connection’), and by assisting parents to respond nonverbally and verbally to their child’s emotions via processes such as ‘turning toward’ and ‘sitting with’ (Havighurst & Harley, 2007; Havighurst et al., 2012). Five RCTs have been conducted, and shown improved parent awareness of and response to their child’s emotions with 106 and 64 parents of pre-schoolers (Havighurst et al., 2010; Wilson, Havighurst, & Harley, 2012), 27 parents of pre-schoolers with clinical behavioural problems (Havighurst, Wilson, Kehoe, Efron, & Prior, 2013), 102 parents of primary school age children with conduct problems (Havighurst, Duncombe, et al., 2014), and with 125 parents of Grade 6 children (Kehoe et al., 2013) compared with controls. Strengths of this approach include its direct attention to NVC; limitations include its reliance on psycho-education to address nonverbal aspects of emotional competence and emotion coaching.

4.5 Discussion Study 1

Although the assessment tools reviewed here successfully measure a range of NVC domains in parent-child relationships for both clinical and nonclinical groups, and for children of all ages, these are not routinely used when interventions are being evaluated unless a child is preverbal, or where the reason for doing so is deemed central to the clinical issue or research question being investigated (e.g., congruence between self-report and observed parent-child interaction). This is particularly surprising, given the rigour of empirically based theory-building that has informed thinking about the importance of NVC in parent-child relationships, for example in parents’ socialisation of their children’s emotions and the resulting implications for children’s development (Gottman et al., 1997). This may reflect a clinical assumption that verbally oriented approaches will be effective in addressing nonverbal processes that may drive and entrench problematic parent-child interaction. The
emerging awareness in clinical research and practice of the important role of NVC in attachment, emotional competence and consequently children’s development means that observational assessments of NVC are more routinely conducted; however this has not yet translated into inclusion of NVC as a key part of intervention.

A handful of interventions have been developed that directly target nonverbal parent-child interaction processes using play and the creative arts; however many of these have not been subject to empirical evaluation, nor have they utilised validated nonverbal assessment tools to either inform intervention or measure outcome. The delivery of these interventions may require specialised training in creative arts or play therapies, rather than being able to be administered by professionals who routinely work with parents and their children, meaning that the extent to which they may be more widely available may remain limited. Play and music have been used to directly work with NVC in interventions with parents and children across all age groups, and play- or music-informed interventions may be further developed for use by therapists from a range of disciplines.

Several of the interventions discussed in this paper do not utilise the reviewed assessment tools to inform intervention; those that do employ nonverbal assessment measures do not then use this information to directly address nonverbal processes. Nonverbal assessment information may more commonly be used to measure outcomes of verbal intervention strategies, or to provide baseline information about client characteristics that may facilitate or limit intervention effectiveness (Lumley, Neely, & Burger, 2007). With the exception of Jacobsen’s APCI (S. Jacobsen & Killen, 2015) and the Marschak Interaction Method (Bojanowski & Ammen, 2011), nonverbal assessment information does not appear to directly inform formulation of nonverbal intervention strategies that may then be re-evaluated to measure intervention effectiveness.

The need to translate empirically based theory and research findings into intervention development has been identified in the literature (Samur et al., 2013), and is supported by this
review. Intervention development may additionally be informed by existing nonverbal assessment tools, many of which already have established good reliability and validity, and therefore may assist with intervention formulation as well as outcome measurement. This may further indicate a need for therapists to better acquaint themselves with these tools to measure their therapeutic impact. Interventions targeting NVC may be reliant on experiential mediums (e.g., creative art therapies) that facilitate nonverbal ways of working with nonverbal processes. Given the crucial importance of NVC for effective parenting and parent-child communication, we recommend that NVC is assessed and addressed explicitly as a core part of parent-child intervention, development and evaluation.

4.6 Limitations Study 1

This review was subject to a number of limitations; in particular that only a small number of interventions were found that met our search criteria, and that only English language publications were included. It is possible that by widening our search to include studies published in other languages, or to use different search terms that we may have discovered other inclusive interventions. It is also possible that many interventions do address NVC, but have not made this explicit when publishing outcomes. For example, the Exploring Together programme pays considerable attention to NVC in the unpublished manual but not in publically available articles (Hemphill & Littlefield, 2001). This meant for the purposes of this review it was difficult to determine whether or not NVC is targeted in many published interventions.

4.7 Future Directions Study 1.

The need to translate empirically based theory and research findings into intervention development has been identified in the literature (Samur et al., 2013), and is supported by this review. Intervention development may additionally be informed by existing nonverbal assessment tools, many of which has established good reliability and validity, and therefore may assist with intervention formulation as well as outcome measurement. This may further
indicate a need for therapists to better acquaint themselves with these tools to measure their therapeutic impact. Interventions targeting NVC may be reliant on experiential mediums working with nonverbal processes. Given the crucial importance of NVC for effective parenting and parent-child communication, we recommend that NVC is assessed and addressed explicitly as a core part of parent-child intervention, development and evaluation.
Chapter 5: Study 2. Pilot Randomised Controlled Trial of *Tuning Relationships with Music™*: Intervention for Parents with a Trauma History and their Adolescent

5.1 Abstract Study 2

For parents who have experienced childhood interpersonal trauma, the challenges of parenting an adolescent may trigger memories of abuse, intensifying conflict, resulting in negative cycles of relating and poorer responsiveness to emotions when parenting. This study examined whether *Tuning Relationships with Music™* (TRM), a dyadic therapy for parents and adolescents, increased responsive parent-adolescent interactions and parent emotion coaching whilst reducing conflict and adolescent mental health difficulties. Twenty-six parent-adolescent dyads were recruited if parents had a trauma history and the dyad were currently having high levels of conflict. Dyads were randomly allocated into intervention or wait-list control and completed questionnaires and observation assessments at baseline and 4-month post-baseline follow-up. Those allocated to the intervention condition participated in 8 sessions of TRM. Trial registration: ANZCTR: 12615000814572. Parents and adolescents reported significant reductions in conflict. Parents in the intervention condition were observed to significantly improve their nonverbal communication, emotional responsiveness and non-reactivity toward their adolescent. Although parents reported they were less dismissive and punitive, and more encouraging of their adolescent’s emotions, and both parents and adolescents reported improvements in the adolescent’s mental health, these were not statistically significant. Findings suggest TRM may assist parents with a history of childhood interpersonal trauma and their adolescent to reduce conflict and increase responsive ways of relating that may positively impact the young person’s mental health. Future trials with a larger sample are warranted.
5.2 Introduction Study 2

Parents with a history of childhood interpersonal trauma, defined as repeated abuse or neglect committed by someone trusted or depended upon (van der Kolk et al., 2005), often struggle in responding to their own children. They are more likely to be harshly punitive (Lieberman et al., 2004) and to negatively attribute angry, threatening or coercive intentions to their children (Schechter et al., 2014). Unresolved trauma can interfere with processes related to optimal caregiving (A. N. Schore, 2001) at a neurobiological, emotional and behavioural level. This can affect parents’ ability to respond in ways that promote and coach their children’s emotional competence (appropriate emotion understanding and regulation) (Eisenberg et al., 1998). Parents experiencing emotional numbing or avoidance in the aftermath of traumatic events may be further compromised in their capacity to notice, then respond consistently and sensitively to children’s nonverbal and verbal auditory and visual cues that signal their emotional state (Schechter et al., 2014).

Parents’ difficulties may also be considered from the perspective of attachment theory, which provides a way to understand the crucial importance of caregivers and the strategies employed by children to maintain proximity to an attachment figure, even when they are threatening or unavailable (Bowlby, 1969). Where parents have had to employ insecure or disorganised attachment strategies in order to cope with an abusive or neglectful caregiver in childhood, the experience of danger is central in organising their own caregiving behaviour (Crittenden, 2006b). Parents’ dismissive/unresponsive or preoccupied/reactive responses may therefore be understood as an attempt to create a sense of safety, but cause disrupted interactions that induce a sense of fear in their children (Riggs & Kaminski, 2010).

Parents who struggle with nonverbal emotion recognition and expression are more likely to overprotect or parent intrusively (Thorberg et al., 2011), or to use unsupportive parenting strategies (Cuzzocrea et al., 2015) when their child experiences emotions. Their children may therefore not learn effective ways to express emotions, or to accurately interpret
others’ nonverbal expressions. Children can then experience difficulties regulating emotion in the parent-child relationship and other social contexts. These difficulties have been associated with mental health problems in childhood including depression (van Beek & Dubas, 2008) and social anxiety (McClure & Nowicki, 2001). Parents’ and children’s interlocking difficulties with recognising, accurately interpreting and responding to the other’s nonverbal cues may mean that mutually regulating and enjoyable interactions are not able to develop. Instead, maladaptive interactions that reinforce emotionally dysregulated responses become entrenched. Processes such as reciprocal nonverbal communication of anger may further exacerbate these interactions, which are associated with greater parent-adolescent conflict (Eisenberg et al., 1998).

Negative cycles of interaction may escalate in both prevalence and intensity when a child reaches adolescence, which is often an emotionally challenging time for families (K. J. Kim et al., 2001). Parents with an interpersonal trauma history may experience their adolescent’s normal strivings for autonomy and independence, and increased emotionality as rejecting and reminiscent of earlier abuse or neglect (van Ee et al., 2015). As a result, conflict may remain heightened and unresolved, with detrimental implications not only for open parent-adolescent communication, but also for the adolescent’s social, emotional and behavioural functioning (Moed et al., 2014) and mental health (Crowell et al., 2013).

Evidence-based therapies have not been developed to address the challenges faced by parents with a trauma history; instead, existing interventions have been modified to meet their needs (A. Carr, 2014). Parents receiving treatment for Posttraumatic Stress Disorder (PTSD) may be offered family therapy that incorporates interventions such as Trauma-Focused Cognitive Behavioural Therapy (Bisson et al., 2013) as part of an integrated approach. Therapies for children who have experienced trauma include working with parents, and may address parental trauma where it impacts on the parent-child relationship (Lieberman et al., 2004). However, evidence of the effectiveness of interventions that address
parenting difficulties for parents with a trauma history is limited (Maliken & Katz, 2013). A review of the research on challenges and treatment for parents with PTSD recommends systemic approaches that highlight the restoration of safety, re-establishment of secure attachment relationships and regulation of arousal in response to trauma triggers evoked by parent-child interaction (van Ee et al., 2015). These recommendations may also apply for parents with a history of childhood abuse or neglect, who may not meet criteria for PTSD, and/or may exhibit comorbid conditions (van der Kolk et al., 2005). Achieving these goals may require attention to parent emotion socialisation practices that are known to shape children’s emotion regulation and nonverbal processes that may drive negative escalating cycles (Colegrove & Havighurst, 2017). Therefore an approach focusing on teaching emotion socialisation and nonverbal communication skills may be indicated when intervening therapeutically with parents who have experienced childhood interpersonal trauma and their children.

Nonverbal communication may be thought of as a ‘musical’ process where rhythm, pitch, tone and volume of the voice are used to convey inter-subjective recognition and sharing of emotional states (Stern et al., 1998). Music is used by parents in all cultures to engage children in responsive patterns of relating (Nakata & Trehub, 2004), and is extensively utilised by adolescents to communicate and manage emotions (Hallam, 2010). Music both activates and deactivates amygdala activity (Koelsch & Siebel, 2005), and modifies heart and respiration rates to assist relaxation and stress reduction (Chanda & Levitin, 2013). Music may therefore help parents learn how to respond to their child’s nonverbal communication (S. Jacobsen et al., 2014) and enhance emotion regulation strategies for both parent and adolescent (Fancourt et al., 2014).

Tuning Relationships with Music™ (TRM) was developed to address parent-adolescent conflict where a parent has experienced childhood abuse or neglect, using music to target nonverbal communication as a part of effective interpersonal functioning. TRM
focuses on teaching parents skills in emotion regulation (including managing trauma triggers), then adaptive emotion socialisation skills (emotion coaching) to respond to their adolescent using skills such as ‘turning toward’, ‘sitting with’ and ‘softened start-up’ (Gottman et al., 1996; Havighurst et al., 2012). Focusing on emotion coaching is the basis of an evidence-based parenting program entitled Tuning in to Teens (Havighurst et al., 2012), from which psycho-educational materials were taken for use in TRM. TRM teaches dyads skills in identifying, empathically responding to and regulating their own emotions as a precursor to the parent learning emotion coaching. Using instruments that require no musical training, dyads master nonverbal elements of emotional expression and empathic response (i.e., volume, tempo, turn taking) before verbal equivalents are introduced. Adolescents are asked to adopt the role of ‘expert’ in how they feel and what they need from their parent, to accept their parent’s efforts to use skills learned in therapy, and to give constructive feedback about what assists them to regulate and communicate their emotions. Once skills are mastered, dyads revisit conflict issues and practice working through these nonverbally with music. Parents are then supported to use emotion coaching during verbal conflict discussions, whilst maintaining an awareness of nonverbal communication. Adolescents are supported to remain engaged in the conflict discussion, to regulate their emotional response, and to use ‘turning toward’ and ‘softened start up’ when communicating with their parent.

This study aimed to evaluate the effectiveness of TRM with parents and adolescents where a parent had experienced childhood abuse or neglect, and where the dyad reported conflict in their relationship. The study had four aims. The first was to assess whether parents were able to relate responsively to their adolescent after completing TRM. The second was to investigate how successful TRM was in reducing parent-adolescent conflict. The third was to examine changes in emotion coaching practices including parents’ capacity to empathise with their adolescent’s negative emotions. The final aim was to consider whether there were any resulting improvements in the adolescent’s mental health.
5.3 Method Study 2

5.3.1 Participants study 2.

Parent-adolescent dyads were recruited (December 2015- June 2017) from adolescent clinical services, family services and an existing University of Melbourne research study (see Figure 3). Dyads were referred by staff, or could self-refer. An initial meeting informed dyads about the trial, obtained consent/assent to participate (see Appendix B for participant letters and consent/assent form), and screened for eligibility. Dyads were eligible if (1) the adolescent was 10 – 18 years, (2) the parent reported experiences of childhood abuse or neglect on the Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998), and (3) the dyad reported conflict in their relationship on the Conflict Behaviour Questionnaire (Prinz, Foster, Kent, & O'Leary, 1979). Exclusion criteria were: current perpetration of or exposure to abuse where the perpetrator was living in the home, homelessness, intellectual disability, acquired brain injury, autism spectrum, psychosis, severe hearing loss, and inability to communicate in English without an interpreter present.

Forty dyads were screened for eligibility. Five did not meet eligibility criteria, and nine declined to participate. Parents rated their experiences of trauma on the CTQ as low-moderate (38.5%), moderate-severe (11.5%) or severe-extreme (50%). Demographic information is shown in Table 4.
Table 4  Demographic Information

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<tr>
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<th>Intervention (n = 13)</th>
<th>TAU (n = 13)</th>
<th>Total Sample (N = 26)</th>
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<tr>
<td></td>
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<tr>
<td>Adolescent gender</td>
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<tr>
<td></td>
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<td>-------</td>
<td>-------</td>
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<td></td>
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</tr>
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<td>1.00**</td>
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<td>≥ $100,000</td>
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<td>3 (23.1)</td>
<td>7 (26.9)</td>
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<tr>
<td>Receiving mental health and/or support services</td>
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<tr>
<td>Parent</td>
<td>5 (38.5)</td>
<td>4 (30.8)</td>
<td>9 (34.6)</td>
<td>1.00**</td>
</tr>
<tr>
<td>Adolescent</td>
<td>7 (53.8)</td>
<td>7 (53.8)</td>
<td>14 (53.8)</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* TAU = treatment as usual

*Chi-square test  ** Fisher’s exact test*
5.3.2 Procedure study 2.

The second author used a computer-generated program to randomise participants to intervention or wait-list control. Both conditions received treatment-as-usual, and completed baseline and 4 months post-baseline follow-up measures. The first author, a Master’s level family therapy and music therapy clinician, conducted all observational assessments and delivered the intervention. To limit potential bias, two music therapy clinicians (PhD and Masters level) who were blind to participant allocation or pre/post status conducted inter-rater reliability coding (Intra-class Correlation) with a randomly selected 20% of video-recorded parent-adolescent interactions using the Assessment of Parent-Child Interaction (S. Jacobsen & McKinney, 2014) and the Assessment of Responsiveness, Reactivity and Turn Taking (Colegrove & Havighurst, 2016a) coding manuals.

The University of Melbourne Health Sciences Human Ethics Committee approved all procedures used in the study (see Appendix A for copy of ethics approval letter), and written informed consent/assent from parents and adolescents was obtained prior to participation. The trial was registered with the Australian and New Zealand Clinical Trials Registry (ANZCTR: 12615000814572, http://www.ANZCTR.org.au/).

5.3.3 Intervention study 2.

_Tuning Relationships with Music™_ (TRM) consists of eight one-hour sessions conducted weekly. Sessions 1, 2 and 5 are individual meetings with parent and adolescent, 3-4 and 6-8 are conjoint sessions. Dyads are assisted to interrupt negative escalating cycles of interaction and develop responsive patterns of communicating using emotional competence (parent and adolescent) and emotion coaching skills (parent). Nonverbal skills are taught via a sequence of musical exercises, for example an exercise that aims to promote awareness of emotions asks the parent and adolescent to listen to an instrument being played and comment on how this makes them feel, and where they notice this in their body.
Figure 3. Participant flow.
Instruments are then selected and used to create a sense of calm in response to emotions experienced as difficult. An exercise that teaches a parent how to ‘sit with’ their adolescent asks a parent to choose an instrument they can play quietly alongside their adolescent’s musical representation of sadness. Verbal skills are taught to parents using psycho-educational materials from the Tuning in to Teens parenting program (Havighurst et al., 2012) that teaches emotion coaching strategies, provides information about adolescent emotional development and suggests ways parents may assist their adolescent to problem solve when they are in conflict. TRM aims to equip dyads with new functional ways of interacting, especially during times of heightened conflict and emotion.

TRM was delivered using a manual with the therapist completing fidelity checklists to ensure consistency in intervention delivery. Dyads in both intervention and control conditions received treatment-as-usual during the study. This included psychological services (adolescents 50%; parents 15.3%), psychiatric treatment (adolescents 7.7%, parents 7.7%), family therapy (11.5%), family support (23.1%) and other allied health interventions (11.5%). Numbers of dyads receiving each service were equivalent across intervention and control conditions.

5.3.4 Screening measure study 2.

**Childhood Trauma Questionnaire (CTQ).** The CTQ (Bernstein & Fink, 1998) is a validated and reliable screening tool for adults, measuring experiences of childhood abuse or neglect. Twenty-eight items are rated on a 5-point Likert scale, and measure five types of maltreatment—emotional, physical and sexual abuse, and emotional and physical neglect. Examples of items include “I got hit so hard by someone in my family that I had to see a doctor or go to the hospital”. Three additional items form a minimisation/denial scale to identify participants who may under-report maltreatment. Scores are classified into categories of none-minimal, low-moderate, moderate-severe, and severe-extreme levels. In this study, the CTQ had internal consistency of $\alpha = .94$.

5.3.5 Outcome measures study 2.

**Assessment of Parent-child Interaction (APCI).** The APCI is a reliable and validated observational music therapy assessment tool measuring nonverbal parent-child interaction (S.
Dyads are video-recorded while they complete musical improvisation exercises that assess their nonverbal communication and the parent’s emotional response to their child. Scales are Nonverbal Communication (how parent and child communicate nonverbally), Emotional Parental Response (how the parent responds to their child’s emotions), Mutual Attunement (how well the parent matches their child) and a total score. Scores are based on autonomy events, frequency/quality of turn giving (parent and child), and of musical, gestural and verbal parental responses. In this study, the APCI showed internal consistency at baseline/follow-up of $\alpha = 0.99 / 0.77, 0.86 / 0.87, 0.65 / 0.70$, and $0.65 / 0.77$, and inter-rater reliability of $0.87, 0.93, 0.88$ and $0.87$ for the Nonverbal Communication, Emotional Parental Response, Mutual Attunement and total scores respectively.

**Assessment of Responsiveness, Reactivity and Turn Taking (ARRT).** The APCI (above) measures parent-child interaction while playing music exercises, rather than during conflict. Therefore the ARRT was developed for the current study to measure nonverbal components of interaction that may occur specifically during conflict (Colegrove & Havighurst, 2016a). Dyads completed the Abridged Issues Checklist (Robin & Foster, 1989), selected three issues that cause them conflict, then were asked to show ‘everything but the words’ when interacting about each issue using musical instruments. These interactions were video-recorded. Responsiveness, Reactivity and Turn Taking Scales were developed to capture these aspects of dyadic interaction, measuring, for example, to what extent the parent played their instrument louder than their adolescent (reactivity), mirrored their adolescent’s playing (responsiveness), or stopped (took turns) when their adolescent played their instrument. Higher scores represent greater responsiveness, less reactivity and more turn taking. In this study, the ARRT had internal consistency at baseline/follow-up of $\alpha = 0.88 / 0.97, 0.83 / 0.98$ and $0.93 / 0.97$, and inter-rater reliability of $0.83, 0.91$ and $0.98$ for the Responsiveness, Reactivity and Turn Taking scales respectively.

**Conflict Behaviour Questionnaire (CBQ).** The CBQ (Prinz et al., 1979) consists of 20 true/false items assessing frequency and intensity of conflict in parent-adolescent interactions during
the last 2 weeks. Examples of items include “At least three times a week, we get angry at each other”. Validity has been established by showing that distressed families report significantly higher scores on this scale than non-distressed families (Robin & Foster, 1989). In this study, the CBQ had internal consistency at baseline/follow-up for parents (α = .84/.92) and adolescents (.92/.89).

**Emotions as a Child Questionnaire (EAC).** The EAC rates parents’ responses to their adolescent’s emotions, reported by parent and adolescent (Magai, 1996). Forty-five items are rated on a 5-point Likert scale. Parents’ responses to sadness, anger and anxiety are grouped into *Encourage, Punish, Neglect, Magnify* and *Override*. Examples of items include “When my child was fearful, I told her/him not to worry”. For the purposes of this study, these scales were combined with the *Encourage* Scale reverse-coded to create a *Total Dismissing* score, where higher scores represent higher emotion dismissing. Studies have reported acceptable reliability and validity (O’Neal & Magai, 2005). In the present study, the EAC had internal consistency at baseline/follow-up of α = .91/.92 (parents) and α = .84/.70 (adolescents).

**Strengths and Difficulties Questionnaire (SDQ).** The SDQ is a well-validated questionnaire of the adolescent’s functioning (Goodman, 1997). Four of the subscales (*Emotional Problems, Hyperactivity, Conduct Problems* and *Peer Problems*) are combined to give a *Total Difficulties* Score, whereas the *Pro-social* scale is a measure of strengths. The *Total Difficulties* scale was used in the current study. In this study, the SDQ had an internal consistency at baseline /follow-up of α = .74/.77 (parent report) and .68/.78 (adolescent report).

**5.3.6 Data analytic plan study 2.**

Baseline demographic variables across participants in the two conditions were compared using chi-square or Fisher’s exact tests. T tests or Mann-Whitney U tests were used to compare baseline screening and outcome variables. Next, using an intent-to-treat analysis that assumed no change for participants who did not complete post-assessment measures, Analyses of Covariance (ANCOVA), controlling for baseline scores, were calculated for all clinician-observed and self-report measures. As there were no significant differences on demographic/outcome variables for
participants in the two conditions, no further covariates were included. Where ANCOVA assumptions were violated, bootstrapping was performed to calculate robust estimates of the mean, from which revised confidence intervals and standard errors were derived. Effect sizes were calculated using partial eta squared, where small effect sizes are .010, medium effects are .060, and large effects are .138 or above (Cohen, 1988). For measures that showed statistically significant change, clinical change was calculated using the Reliable and Clinical Change Indices (N. S. Jacobsen & Traux, 1991). The percentage of dyads that experienced reliably and clinically significant change was calculated, and chi-squares were used to measure the extent of change.

5.4 Results Study 2

5.4.1 Preliminary analyses study 2.

All data were screened for missing values. Data was missing for two participants (7.7%) at follow-up. Missing participants’ pre-intervention data was carried forward, using an intention-to-treat approach for all calculations. T tests, Mann-Whitney U tests and chi-square analyses found no significant differences between intervention and waitlist control (TAU) participants at baseline on all socio-demographic, screening and outcome variables.

One hundred percent of intervention participants completed therapy and post-assessment measures, and 84.6% (11/13) of TAU participants completed post-assessment measures. The two non-completers cited family difficulties (1) and being too busy (1) as reasons for withdrawal. No significant baseline differences were found between participants missing at follow-up compared with those who completed post-assessment measures.

5.4.2 Correlations for Assessment of Responsiveness, Reactivity and Turn Taking.

Moderate correlations (Spearman’s rho) were found between baseline Responsiveness and adolescent reported CBQ ($r = -.36, p = .069$), Reactivity and severity of parent-reported physical neglect on the Childhood Trauma Questionnaire ($r = .48, p = .013$), Reactivity and parent-rated EAC ($r = -.41, p = .036$); and Turn taking and parent-rated EAC ($r = -.45, p = .02$). Correlations between the ARRT and APCI total scores were low and therefore statistically insignificant (Responsiveness
\[ r = -0.25, p = 0.214; \text{Reactivity } r = -0.29, p = 0.146; \text{Turn taking } r = 0.09, p = 0.663 \] indicating that these may be assessing different constructs.

5.4.3 Main analyses study 2.

Table 5 shows pre and post-intervention means, standard errors, confidence intervals and ANCOVA results. On the APCI, parents were observed to significantly improve their nonverbal interaction with their adolescent, to be more emotionally responsive, and better able to respond to their adolescent’s nonverbal communication for intervention compared with TAU participants. There was no change in parents’ ability to be attuned with their adolescent. On the ARRT (capturing nonverbal conflict interaction), intervention parents were observed to be significantly less reactive, more responsive and more likely to take turns during parent-adolescent conflict interaction at follow-up compared with TAU parents. As shown in Table 5, intervention participants reported significantly less parent-adolescent conflict at follow-up compared to TAU participants. Although changes were in the expected direction, ANCOVAs were not significant for the EAC or SDQ.

Table 6 shows the results of reliably and clinically significant change analyses, showing the proportion of families that showed significant improvement or deterioration from baseline to follow-up. Reliably significant change calculates change that is unlikely to be due to measurement unreliability (i.e., how consistent scores may be when administered in different environments or at different times) and clinically significant change addressing whether an intervention has been effective, by showing movement from a score that indicates clinical level difficulties to one more typical of the ‘normal’ population (N. S. Jacobsen & Traux, 1991). A significantly higher proportion of intervention parents were observed to be more emotionally responsive, less reactive, and take more turns during music exercises and conflict interactions with their adolescent compared with TAU parents. Significantly more intervention parents reported a reliable improvement compared to TAU parents on parent-adolescent conflict. Nonverbal Communication, Emotional Parental Response, Reactivity and Turn taking were reliably deteriorated at follow-up for one TAU parent only. No reliable deterioration was reported or observed for intervention dyads.
## Table 5  
*Intervention Outcomes*

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## Adolescent report

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### Note

ANCOVA = analyses of covariance; M = mean; SE = standard error; CI = confidence interval; $df$ = degrees of freedom; TAU = treatment as usual; APCI = Assessment of Parent-Child Interaction; EPR = Emotional Parental Response; MA = Mutual Attention; NVC = Nonverbal Communication; ARRT = Assessment of Responsiveness, Reactivity and Turn taking; CBQ = Conflict Behaviour Questionnaire; EAC = Emotions as a Child Questionnaire; SDQ = Strengths and Difficulties Questionnaire.

^ Bootstrapped adjusted M, SE, CIs.

*p < .05; **p < .01; ***p < .001.
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*Note. TAU = treatment as usual; APCI = Assessment of Parent-Child Interaction; EPR = Emotional Parental Response; NVC = Nonverbal Communication; CBQ = Conflict Behaviour Questionnaire.

# $\chi^2$ Pearson’s chi-square/Fisher’s exact test  *Clinical norms not available
One TAU parent and two adolescents reported that conflict had reliably deteriorated at follow-up. Finally, more intervention parents reported and were observed to shift out of the clinical range of problematic conflict interaction compared with TAU parents.

5.5 Discussion Study 2

*Tuning Relationships with Music™* (TRM) aimed to improve nonverbal communication and reduce parent-adolescent conflict where parents had a history of childhood abuse or neglect and dyads were presenting with a conflictual relationship. The intervention taught dyads to reduce conflict by focusing on nonverbal communication and parent emotion socialisation practices. After completing TRM, parents were observed to be less reactive and more responsive with their adolescent, and dyads reported less conflict in their relationship. These changes were statistically, reliably and clinically significant and suggest that TRM may improve parent-adolescent relationships for dyads where issues are often intractable.

The first aim of this study was to assess whether parents developed responsive patterns of relating to their adolescent. Following participation in TRM parents were observed to be significantly more responsive and less reactive towards their adolescent. Parents’ ability to remain non-reactive during conflict is related to more open communication in parent-adolescent relationships (Moed et al., 2014) but may be challenging for parents who are managing the effects of childhood interpersonal trauma. Introducing nonverbal communication skills sequentially allowed parents to regulate their own emotions before attempting to respond to their adolescent. Further nonverbal communication skills assisted them to remain regulated whilst staying engaged with their adolescent. Once verbal strategies were introduced, awareness of nonverbal communication enhanced parents’ capacity to remain calm, accurately interpret their adolescent’s communication, and to then adjust their responses.
The second aim was to investigate how successful TRM was in reducing parent-adolescent conflict. Following participation in TRM dyads reported significantly less conflict. Many parents in this sample were highly reactive to their adolescent’s emotional expression and/or reluctance to communicate. Those who received TRM explored different understandings of their adolescent’s emotions, and received feedback from their adolescent about which nonverbal communication skills helped them to remain emotionally regulated and positively engaged in conflict discussions. Assisting parents to inhibit reactivity and learn responses that enhance young people’s experiences of security in the parent-child relationship are considered key principles for parent-child intervention where a parent has PTSD (van Ee et al., 2015).

We also found significant improvements in clinician-observed parent nonverbal communication. Nonverbal communication skills are a key aspect of responding sensitively to emotions, and remaining emotionally regulated (Cuzzocrea et al., 2015). Research has established a link between PTSD and negative beliefs that influence relationships (Christensen, Cohan, & Stein, 2004). TRM focused on assisting parents to understand their adolescent’s nonverbal communication, while also becoming aware of their own nonverbal communication and its impact on their adolescent. Potentially this increased awareness influenced changes in parents’ trauma-related perceptions of their adolescent’s intentions, making them less likely to experience their dysregulated or non-communicative adolescent as abusive or neglectful.

The third aim was to examine changes in parent emotion coaching, with an aim of reducing dismissive responses to their adolescent’s emotions. Neither parent nor adolescent reports achieved statistical significance. Intervention parents reported somewhat reduced emotion dismissing. Parents reported that they were more likely to remain calm, and comfort their adolescent when s/he expressed negative emotions, compared with TAU parents. However parents’ reports were not corroborated by adolescent report or Mutual Attunement
scores; this means that parents and adolescents may view their interactions differently. These results may also reflect an expectancy bias: parents hoped they had become less emotion dismissing, and so reported that this was the case. The Emotions as a Child Questionnaire, used in this study to measure changes in parent emotion dismissing, is weighted toward assessing parent’s verbal responses to their child. Due to the emphasis of TRM on nonverbal communication, it is likely that parents were not given sufficient time in sessions to master verbal aspects of emotion coaching in order to consistently reduce emotion dismissing responses.

The final aim was to evaluate whether there were any improvements in adolescents’ mental health after participation in TRM. Neither parent nor adolescent reports reached statistical significance. Intervention participants reported moderate improvements compared with those in the TAU condition. Intervention adolescents who discussed their mental health difficulties during TRM noted that they appreciated feeling better supported by their parent, but preferred to work alone on the strategies they were receiving in psychological treatment. Parents’ acceptance of this fits with adolescent developmental needs for autonomy, and may be supported by strategies that assist parents to regulate their emotions (Havighurst, Kehoe, & Harley, 2015).

5.6 Limitations Study 2

Recruitment of a sample with childhood interpersonal trauma and a conflictual parent-adolescent relationship resulted in a small sample size – a larger sample would have improved the power to detect differences between intervention and TAU participants. Boys were more likely than girls to decline to participate in the study. Further studies may explore how to successfully engage boys in TRM. Only one father participated in the study, possibly reflecting the challenges experienced by referring services in successfully engaging fathers (Tehan & McDonald, 2010). Further studies may explore how to reach fathers who may be interested in taking part in TRM. Both intervention and control groups received TAU during
the study, meaning that intervention dyads received more treatment than control dyads, potentially creating a ‘dose-response’ effect that may influence results (Hansen, Lambert, & Forman, 2002). The first author was the creator of TRM, and the clinician delivering assessment and intervention, which may reduce the objectivity of findings. Although all observational measures were subject to inter-rater reliability, which was acceptable for all measures, results should be interpreted with caution. TRM focused on the acquisition of nonverbal communication skills; this meant that only two sessions were allocated to teaching parents verbal responses. Additional sessions may have allowed parents time to master emotion coaching skills that may help to reduce emotion dismissing responses which, in turn, may have improved adolescent emotional and behavioural difficulties. This study did not assess whether gains were maintained over time. It is likely that relationship changes occur at a slower rate for dyads during this time of developmental transition (McGue, Elkins, Walden, & Iacono, 2005), and where a parent’s challenges due to experiencing childhood interpersonal trauma mean that interaction patterns may be more entrenched. Asking dyads to complete measures at a later time may help to assess these.

5.7 Conclusion Study 2

This pilot study found that Tuning Relationships with Music™, an intervention for parents with a trauma history and their adolescent, led to a reduction in the dyad’s conflict by assisting parents to be less reactive and more skilled at accurately recognising and responding to their adolescent’s nonverbal communication. Replication with a larger sample is warranted. This study makes a contribution to the existing research on parent-adolescent intervention and suggests that a focus on nonverbal communication may increase responsive interactions and reduce conflict in parent-adolescent relationships. The use of music may improve retention in therapy for families who are often hard to engage in clinical practice. Further research will be useful to elucidate whether focusing on nonverbal communication
may be helpful for other client groups where the lack of these skills may contribute to relational difficulties.
Chapter 6: Study 3. Emotion Regulation during Conflict Interaction after a Music Therapy Intervention: Understanding Changes in Parents with a Trauma History and their Adolescent

6.1 Abstract Study 3

For parents who have experienced childhood maltreatment, the demands of parenting an adolescent may trigger memories of abuse or neglect, intensifying parent-adolescent conflict. This paper extends an earlier report of outcomes from a pilot randomised controlled trial (RCT) of Tuning Relationships with Music™, a music therapy intervention for parent-adolescent dyads where parents have a trauma history and dyads are experiencing conflict, in order to look systemically at dyads’ emotional regulation during their musical representation of nonverbal conflict interaction (NCI). The RCT randomly allocated 26 parent-adolescent dyads into intervention or control conditions, and analysed dyads’ self-report and observation measures completed at baseline and 4-month post-baseline follow-up. Aims of the current paper were (1) to examine relationships between parents’ trauma history, parent-adolescent conflict, parents’ reactivity and responsiveness, and dyads’ emotion regulation, consistency and predictability during NCI; and (2) whether a music therapy intervention focused on nonverbal communication (NVC) and emotion regulation would change the dynamics of dyads’ relational conflict. Higher parents’ childhood betrayal trauma and adolescent-reported conflict scores were correlated with predictable NVC sequences whilst dyads were emotionally dysregulated, and parents’ reactivity was correlated with dyads’ inconsistent NVC during NCI. Post-intervention dyads were more emotionally regulated, consistent and predictable during NCI, reported lower levels of conflict and showed increased parent emotional responsiveness and reduced reactivity. Findings indicate that where parents have experienced childhood maltreatment, conflictual parent-adolescent dyads may benefit from intervention focusing on skills that promote emotionally regulated, predictable and consistent NVC during conflict interactions. Trials with a larger sample are warranted.
6.2 Introduction Study 3

Parent-adolescent dyads where the parent has experienced childhood maltreatment are at high risk of experiencing parent-adolescent conflict due to parents’ difficulties with emotion regulation, perception, attention and memory (van der Kolk et al., 2005). These difficulties mean that parents may be reactive and/or non-responsive toward their adolescent (Dixon et al., 2005). Reactivity in parents with a trauma history may include impulsivity, dysregulated anger or controlling/punitive behaviour; non-responsiveness may include emotional detachment and an inability to appreciate their adolescent’s emotional experience. These behaviours are associated with disorders including Complex Posttraumatic Stress Disorder, a condition related to early-in-life experiences of neglect or abuse (Brewin et al., 2017). Parents’ difficulties in turn may have deleterious consequences for adolescent functioning (Moed et al., 2014). Emotion regulation involves the ability to express, inhibit, or modulate one’s physiological or emotional state or behaviour and is an aspect of emotional competence, which also includes recognition of and responsiveness to emotions (Niven et al., 2009). Parents’ emotion regulation problems are exacerbated by a highly reactive amygdala (Rauch et al., 2006) and an increased attentional bias toward nonverbal cues (i.e. tone of voice, posture, facial expressions) in interactions (Jacob, Bruck, Domin, Lotze, & Wildgruber, 2014). Parents with a trauma history have greater difficulty with their own emotion competence and may be affected by altered prefrontal /temporal activity causing emotional numbing or dissociation (Hopper et al., 2007). This may mean that they are more likely to miss and therefore not respond to their adolescent’s nonverbal emotional expressions (Schechter et al., 2014).

Parents who experience heightened reactivity to and/or poor recognition of nonverbal cues are more likely to parent harshly (Bugental, 2005), or use emotionally unsupportive parenting strategies (Thorberg et al., 2011). They may also struggle to respond in a way that coaches the development of adolescents’ emotional competence, a process called emotion
socialisation (Eisenberg et al., 1998). This can create difficulties for adolescents in regulating their emotions and learning to understand others’ nonverbal communication (NVC), which has been associated with mental health difficulties (van Beek & Dubas, 2008). Parent-adolescent dyads may therefore develop problematic interaction patterns where difficulties in understanding and responding to the other’s NVC drive mutually dysregulated and reactive sequences (K. J. Kim et al., 2001). Parents may experience their adolescent’s developmentally normative emotionality and independence as rejecting, evoking memories of abuse or neglect (van Ee et al., 2015). Conflict may therefore occur more intensely and frequently, and remain unresolved, with negative consequences for parent-adolescent communication and the adolescent’s mental health (Crowell et al., 2013).

Emotion regulation is often assessed in parent-child interaction using observation as well as self-report measures, which may provide a way to understand processes that drive escalating patterns of conflict interaction (Gottman, Murray, Swanson, Tyson, & Swanson, 2002). Observational assessment may provide unique information from a range of theoretical perspectives (i.e., attachment, developmental theory, emotion socialisation, family systems) about nonverbal aspects of parents’ and children’s emotion regulation and co-regulation that can inform multi-disciplinary intervention (Colegrove & Havighurst, 2017). Validated and reliable music therapy tools have been developed to capture parent-child NVC, but have not been designed specifically to assess parent-adolescent conflict (S. Jacobsen et al., 2014). Systemic approaches to understanding emotions in parent-adolescent relationships regard conflict escalation as a function of a self-organising and dynamic system where the more established an interaction pattern, the more resistant it is to change (von Bertalanffy, 1968). Patterns are considered ‘attractors’ when dyads remain in them for long periods or repeatedly return to them, and may reveal structural relationship characteristics (Gottman et al., 2002). Attractors can reflect maladaptive or adaptive states, e.g., where parent and adolescent express hostility (maladaptive), or a parent conveys neutral emotion while an adolescent
expresses negative emotion (adaptive). Where interactions are deemed maladaptive, treatment aims to interrupt the system (e.g., teaching skills in managing negative emotions), rendering it sensitive to change toward more adaptive states (Granic & Hollenstein, 2003). Interactions showing variable emotional expression (e.g., where dyads move between positive and negative emotions) indicate a flexible and responsive system (Lunkenheimer, Hollenstein, Wang, & Shields, 2012). Assisting dyads to achieve flexibility and responsiveness in their emotional interaction may therefore be considered a focus for and a desirable outcome of treatment.

State space grids were developed as a way to represent simultaneous events within a system, where the range of all possible behaviours (‘state space’) is represented on a two-dimensional grid (Lewis et al., 1999). Data such as parents’ and adolescents’ negative, neutral and positive emotions (Granic et al., 2003) is then coded sequentially, where a parent’s changing emotions are plotted on the x-axis, and an adolescent’s changing emotions on the y-axis. Each point on the grid represents a dyadic state at a particular time (e.g., parent neutral, adolescent negative). The method is sensitive to quickly moving changes, and allows variables such as consistency (how frequently dyads move between states), predictability (to what extent dyads’ interaction proceeds in orderly sequences), and attractor states to be analysed (Hollenstein, 2013). State space grid analysis of nonverbal emotional expression during parent-adolescent conflict has been extensively used in research; however, this method has not been used to look at interventions.

Parent-adolescent conflict in the context of adolescent clinical difficulties is routinely addressed via systemic interventions (Kaslow et al., 2012); however therapies have not been developed specifically for parents with a trauma history (A. Carr, 2014), and evidence for effectiveness of interventions that address the difficulties faced by parents who have experienced trauma is limited (Maliken & Katz, 2013). A literature review on challenges for parents with a trauma history highlights the need for systemic approaches that focus on
restoring safety, re-establishing secure relationships and regulating reactivity in response to traumatic memories triggered by parent-child interaction (van Ee et al., 2015). A recent study examining relationships between parents’ posttraumatic symptoms, emotion regulation skills and socialisation of children’s emotions stresses the importance of assisting parents to manage triggers in order to remain emotionally regulated when responding to their children’s emotions (Gurtovenko & Katz, 2017). Addressing these goals may require attention to nonverbal processes that drive conflict escalation, and to parent emotion socialisation practices that shape children’s emotion regulation (Colegrove & Havighurst, 2017). An approach that teaches emotionally regulated, consistent and predictable patterns of NVC and adaptive emotion socialisation skills to parent-adolescent dyads may therefore be useful when providing intervention for parents with a trauma history and their children.

NVC may be considered ‘musical’ where vocal nuances are used to express emotions and support interpersonal affect attunement (Stern, 2010; Stern et al., 1998; Trevarthen & Malloch, 2000). Music is utilised by parents to positively interact with children in ways that may enhance attachment relationships (Nakata & Trehub, 2004; Pasiali, 2014), and by adolescents to manage emotions (Hallam, 2010). Music can alter amygdala activity (Koelsch & Siebel, 2005), create temporal predictability and consistency (Clark et al., 2015; Thaut, 2003), and elicit emotions that encourage approach behaviour (Blood & Zatorre, 2001). Music can help parents recognise and respond to their children’s NVC (S. Jacobsen & Killen, 2015) and support emotion regulation (Beck et al., 2017; Fancourt et al., 2014; Sandler et al., 2017). Music can evoke and strengthen connection to feelings that may be dulled consequent to prolonged trauma exposure, assist with evaluation and acceptance of negative emotions, and induce feelings that support coping and enhance a sense of control (Miranda, 2009; Swaminathan & Schellenberg, 2015; Thoma et al., 2012). Music therapy is used with parent-child dyads and families who have a range of clinical and parenting issues which may be underpinned by emotion regulation and NVC difficulties in order to improve parenting and
family functioning, enhance communication, improve relationships and resolve conflicts (S. Jacobsen et al., 2014; Thompson et al., 2013).

_Tuning Relationships with Music™_ (TRM) (Colegrove, Havighurst, Kehoe, & Jacobsen, 2018) is a systemic music therapy intervention developed to assist parent-adolescent dyads to reduce conflict where a parent has experienced childhood maltreatment. TRM uses music to directly address NVC difficulties that may underpin relationship problems. Key principles of TRM are based on guidelines for the stabilisation phase of treatment for Complex Posttraumatic Stress Disorder (Cloitre et al., 2011) which aims to improve emotional and interpersonal functioning before trauma memories can be processed, and can be summarised as follows:

- Establishing interpersonal safety needs to occur before interactions can improve (i.e., assisting a parent to experience their adolescent as non-threatening allows them to then respond to their adolescent in a way the adolescent perceives as safe), and before issues causing parent-adolescent conflict can be addressed.

- Assisting parents to experience and consequently provide a sense of safety in the parent-adolescent relationship requires attention to nonverbal and autonomic processes that affect their ability to remain emotionally regulated.

- Parents will need to learn skills, be equipped with sensory and somatic resources (using music) and receive support during parent-adolescent interaction so that they can be non-reactive and responsive to their adolescent’s emotions that may underpin conflict interaction. Sequences of structured musical exercises are used to teach nonverbal strategies (i.e., strategies that support emotion regulation) in combination with verbal methods (i.e., psycho-education about emotional competence) in order to address each of these.

Preliminary findings (Colegrove, Havighurst, Kehoe, & Jacobsen, 2018) found that participation in TRM enabled parent-adolescent dyads where parents had a trauma history
and the dyad was currently experiencing conflict to significantly reduce parent-adolescent conflict and parents’ reactivity, and significantly increase parents’ responsiveness toward their adolescent. Changes were measured via parent and adolescent self-report and clinician-observed measures of parent behaviour during their musical representation of nonverbal conflict interaction (NCI) (Colegrove et al, 2018). The current study extends this work by looking systemically at dyads’ NCI, using state space grid analysis in order to observe dyads as a single dynamic entity rather than as two separate individuals. The first aim of this paper was to explore correlations between self-report measures (parents’ childhood trauma experiences and parent-adolescent conflict), observational measures (parents’ observed reactivity, responsiveness and turn taking during NCI) and state space grid analyses (emotion regulation, consistency and predictability during NCI) in order to establish the relationship between individual and systemic variables. The second aim was to examine state space grid variables pre and post dyads’ participation in TRM, to ascertain whether participation in the program leads to changes in dyads’ intensity, frequency and duration of emotional expression (attractor states), consistency and predictability during NCI.

6.3 Method Study 3

6.3.1 Description of participants.

Twenty-six parent-adolescent dyads were recruited between November 2015 and June 2017 from adolescent clinical services, family support services and a previous University of Melbourne research study (as shown in Figure 3) where parents had a history of childhood abuse or neglect as reported on the Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998) and the Brief Betrayal Trauma Survey (Goldberg & Freyd, 2006), the adolescent was 10-18 years, and dyads reported conflict on the Conflict Behaviour Questionnaire (Prinz et al., 1979). Recruitment ceased in June 2017 due to time and funding constraints. Exclusion criteria were: current perpetration of /exposure to abuse, intellectual disability, acquired brain injury, autism, psychosis, or inability to communicate in English.
From an initial 40 parent-adolescent dyads, a total of 26 were selected for inclusion and agreed to take part. Five were ineligible, and nine chose not to participate (see Figure 3). Participating parents were mostly mothers (96.1%), and were aged 45 years on average (Standard Deviation (SD) = 5.9). Parents were single (46.1%), married (38.5%) or in blended families (15.4%). Most were born in Australia (65.4%), stated that English was their first language (88.5%), had post-secondary school qualifications (76.9%), and were in paid employment (76.9%). Parents reported incomes of under $60,000 (42.3%), $60,000 - $99,999 (30.8%) and more than $99,999 (26.9%), with $74,776 being the 2016 Australian average (Australian Bureau of Statistics, 2016). Participating adolescents were mainly girls (57.7%), aged an average of 13 years (SD = 1.9). Parents reported their abuse or neglect experiences on the CTQ as low/moderate (38.5%), moderate/severe (11.5%) or severe/extreme (50%).

6.3.2 Procedure study 3.

The second author used a computer program (Research Randomiser) to randomly allocate dyads at sign-up to intervention or control. Baseline measures were collected post-randomisation, and follow-up measures were collected 4 months later. Dyads in both conditions received treatment-as-usual (TAU) during the study, including psychology (adolescents 50%/ parents 15.3%), psychiatry (7.7% /7.7%), family counselling (11.5%), family support (23.1%) and other allied health services (11.5%), all of which employed verbal evidence-based interventions. Numbers receiving mental health and/or support services were similar in both conditions (intervention / TAU: parents 38.5% / 30.8%; adolescents 53.8% / 53.8%).

The first author (a Master’s level family therapist and music therapist) delivered all observational assessments and interventions. To minimise bias, a Master’s level music therapist, unaware of dyads’ condition or pre/post status, conducted inter-rater reliability (IRR) coding with a randomly selected 20% of video-recordings using the Assessment of Volume and Tempo and Assessment of Responsiveness, Reactivity and Turn taking coding
The University of Melbourne Health Sciences Human Ethics Committee approved all procedures, and informed written consent/assent was obtained from parents and adolescents before participating in the study. Trial registration ANZCTR: 12615000814572, http://www.ANZCTR.org.au/.

6.3.3 Intervention description.

_Tuning Relationships with Music™ (TRM)_ comprises 8 one-hour sessions delivered weekly that aims to assist parent-adolescent dyads to learn skills that help them to regulate emotion during conflict interactions, and develop responsive patterns of communicating using emotional competence (parent and adolescent) and emotion coaching skills (parent). TRM teaches dyads skills in identifying, empathically responding to and regulating their own emotions as a precursor to the parent learning adaptive emotion socialisation skills, or emotion coaching (Gottman et al., 1996). Using a sequence of structured and improvisatory musical exercises on pitched and unpitched percussion instruments, dyads master nonverbal elements of emotional expression and empathic response (i.e., volume, tempo, turn taking) before verbal equivalents are introduced. For example, an exercise that aims to enhance a parent’s emotion regulation will ask the parent to experiment with different instruments that assist them to remain calm or return to a calm state while their adolescent represents ‘anger’ on their selected instrument. An exercise that teaches dyads to identify and interrupt a negative escalating sequence asks them to play loudly together, then instructs the parent to stop playing. The parent is then asked to play the instrument they have identified earlier as calming before playing their adolescent’s choice of instrument in a way that the adolescent has previously identified as helpful in assisting them to regulate their emotions and communicate how they are feeling. Once skills are mastered, dyads revisit conflict issues and practice working through these nonverbally using combinations of musical exercises previously taught. Parents are then supported to use emotion coaching (i.e. responding to their adolescent in a way that communicates empathy and acceptance of the adolescent’s
emotions) during verbal conflict discussions, whilst maintaining an awareness of nonverbal communication and emotional/autonomic arousal. Adolescents are supported to remain engaged in the conflict discussion, to regulate their emotional response, and to use ‘turning toward’ (e.g., acknowledging their parent’s emotionally regulated attempt to connect) and ‘softened start up’ (e.g., using quiet-moderate volume when raising an issue) skills (Carrere & Gottman, 1999) when communicating with their parent. Verbal emotion coaching skills are taught using psycho-educational materials from an evidence-based parenting program entitled Tuning in to Teens (Havighurst et al., 2012). A structured manual was used with fidelity checklists ensuring consistency in intervention delivery.

6.3.4 Self-report measures study 3.

**Childhood Trauma Questionnaire (CTQ).** The CTQ (Bernstein & Fink, 1998) is a reliable and validated screening tool that measures adults’ experiences of childhood maltreatment. Twenty-eight items are rated on a 5-point Likert scale, and measure physical, emotional and sexual abuse, and physical and emotional neglect. Items include “Someone molested me”. Three additional items form a minimisation/denial scale to identify under-reporting. Scores are classified into categories of none-minimal, low-moderate, moderate-severe, and severe-extreme levels. In this study, the CTQ had internal consistency of $\alpha = .94$. The measure was used in the current paper to describe parents’ trauma history.

**Brief Betrayal Trauma Questionnaire (BTTS).** The BTTS is a validated 12 item self-report measure (Goldberg & Freyd, 2006) which assesses trauma occurring during childhood and adulthood. The measure is divided into Low, Medium and High subscales based on the level of betrayal. High betrayal refers to a close relationship between a recipient and perpetrator of abuse. Higher scores indicate more trauma events. Answers are divided according to whether events occurred under or over 18 years. Items measuring High Betrayal include “You were emotionally or psychologically mistreated over a significant period of time by someone with whom you were very close (such as a parent)”. Parents completed the
BTTS at baseline. The High Betrayal subscale for traumatic events occurring under 18 years (internal consistency $\alpha = .75$) is considered in this paper, in order to explore the relationship between parents’ childhood abuse or neglect experiences in the context of a caregiving relationship (rather than broader trauma exposure as measured by the CTQ, Medium Betrayal or Low Betrayal) and interpersonal conflict in parenting.

**Conflict Behaviour Questionnaire (CBQ).** The CBQ (Prinz et al., 1979) comprises 20 true/false items assessing conflict in parent-adolescent interactions during the last 2 weeks. Items include “We almost never seem to agree”. Validity has been examined by establishing that distressed dyads report significantly higher scores on this scale than non-distressed dyads (Robin & Foster, 1989). In this study, the CBQ had internal consistency at baseline/follow-up for parents ($\alpha = .84/ .92$) and adolescents ($\alpha = .92/ .89$).

**6.3.5 Measures of nonverbal conflict interaction.**

**Assessment of Volume and Tempo (AVT).** The AVT was developed for the current study to measure nonverbal interaction that may occur specifically during musical representation of conflict (Colegrove & Havighurst, 2016b). Dyads completed the Abridged Issues Checklist (Robin & Foster, 1989), selected three conflict issues, and were then asked to show ‘everything but the words’ when interacting about each using pitched and unpitched percussion instruments. Interactions were video-recorded. Parents’ and adolescents’ instrument playing was coded between 0 (not playing at all) and 6 (playing as loudly/quickly as possible) at 5-second intervals, and volume/tempo were coded separately. 20% of video-recordings were randomly subjected to IRR checking by a Master’s music therapist, blind to dyad condition or pre/post status. IRR for volume/tempo was Kappa = .85 / .70 (parents) and .86/ .81 (adolescents). Coded data were imported into GridWare 1.15a (Lamey, Hollenstein, Lewis, & Granic, 2004). Separate volume and tempo grids were created for each dyad. GridWare was used to create trajectories of dyads’ volume/tempo on a 7 X 7 grid, with parents’ volume/tempo on the x-axis and adolescents’ volume/tempo on the y-axis. Measures
of switching between different volumes/tempi, predictability of sequences, and the predominant level of dyads’ volume/tempo were then generated.

*Volume/tempo attractor states representing levels of emotional regulation.* Dyads’ *attractor* states (where dyads remained at a volume/tempo combination for the longest duration) were identified using the winnowing method, which selects the cell/cells that most strongly reject the null hypothesis that data will be equally distributed across the entire state space grid (Lewis et al., 1999). As shown at Figure 4, higher scores represent more emotionally dysregulated states. Many meanings may be attributed to nonverbal behaviours during conflict interaction. As this was a quantitative study, qualitative data such as participant’s subjective experiences and personal meaning attributed to their behaviour was not sought. For the purposes of this analysis, we theorised that playing loudly/quickly may represent a subcortically driven behavioural expression of the survival-based fight response, which may be activated as the result of trauma triggering during parent-adolescent conflict, and therefore cause emotional dysregulation. Playing very quietly/slowly may indicate that a ‘flight’ or ‘freeze’ response has been triggered, causing emotional withdrawal/avoidance, also a form of emotion dysregulation. Playing at quiet/slow to moderate levels may represent an optimally regulated state when dyads are demonstrating their conflict using music (Peretz, 2010; A. N. Schore, 2001; van der Kolk, 2007). Skills learned in TRM enable parents to keep their volume/tempo either matched to their adolescent’s quiet/slow instrument playing, or at a slightly quieter/slower level than their adolescent’s moderate – loud/quick playing in order to prevent escalation; therefore scores where a parent did not play at all, or played louder/faster than their adolescent were given a higher value.

*Consistency of volume/tempo.* The extent to which dyads varied their volume/tempi was measured using *transitions*, which assesses the number of changes per minute between cells, adjusted for differences in total duration of nonverbal conflict interactions. Higher values indicated more frequent volume/tempo changes, reflecting dyads’ representation of their
conflict as an inconsistent and unstable movement between differing volumes/tempi, which may represent difficulties in remaining consistently coregulated as theorised above.

*Predictability of volume and tempo sequences.* The trajectory of dyads’ movement between differing volumes/tempi was measured using visit entropy, which calculated the probability that their sequence of movement from one volume/tempo to another could be predicted. High levels represent less predictable sequences, where dyads’ conflict was represented as a chaotic movement between differing volumes/tempi. As theorised earlier, this measure may represent an aspect of emotion dysregulation during conflict interaction.

*Assessment of Responsiveness, Reactivity and Turn Taking (ARRT).* The ARRT was developed for the current study to measure parents’ responsiveness, reactivity and turn taking during dyads’ nonverbal conflict interaction described above (Colegrove & Havighurst, 2016a). Examples of items measured include the extent to which the parent mirrored their adolescent’s playing (responsiveness), played their instrument louder than their adolescent (reactivity), or stopped/continued playing (turn taking) when their adolescent played their instrument. Higher scores represent greater responsiveness, non-reactivity and more turn taking. In this study, the ARRT had internal consistency at baseline/follow-up of $\alpha = .88/.97, .83/.98$ and $.93/.97$, and inter-rater reliability (intra-class correlation) of $\alpha = .83, .91$ and $.98$ for the responsiveness, reactivity and turn taking scales respectively.
Cells

0. Parent’s and adolescent’s volume or tempo are evenly matched at a moderate level
1. Parent’s volume/tempo is quiet/slow- moderate, adolescent’s volume/tempo is loud/quick
2. Parent’s volume/tempo is quiet/slow, adolescent’s volume/tempo is variable
3. Parent’s moderate volume/tempo is louder/quicker than the adolescent’s volume/tempo
4. Parent is not playing, adolescent’s volume/tempo is variable
5. Parent’s volume/tempo is loud/quick, adolescent’s volume/tempo is moderate - loud/quick
6. Parent’s volume/tempo is loud/quick, adolescent’s volume/tempo is quiet/slow/stopped

Figure 4. Volume and tempo attractor scores.
6.3.6 Data analytic plan study 3.

Demographic variables for participants in both conditions were compared using chi-square or Fisher’s exact tests. Baseline screening and outcome variables at baseline were compared using T tests or Mann-Whitney U tests. Next, Spearman rho correlations were calculated to determine the strength of the relationship between variables, where a small correlation is .10 - .29, medium correlations are .30 - .49, and large correlations are .50 or above (Cohen, 1988). As this research was exploratory and preliminary, Bonferroni correction was not used, in order to avoid loss of precision and Type 2 error (Armstrong, 2014). Finally, using an intent-to-treat analysis that assumed no change for participants who did not complete post-assessment measures, Analyses of Covariance (ANCOVA), controlling for baseline scores, were calculated for all measures. As there were no significant differences on demographic/outcome variables for participants in the two conditions, no further covariates were included. Where ANCOVA assumptions were violated, bootstrapping was used to calculate robust estimates of the mean, from which revised confidence intervals and standard errors were derived. Effect sizes were calculated using partial eta squared, where small effect sizes are .010, medium effects are .060, and large effects are .138 or above (Cohen, 1988).

6.4 Results Study 3

6.4.1 Preliminary analyses study 3.

All intervention participants completed intervention and follow-up measures, and 11/13 (84.6%) of TAU participants completed follow-up measures. Family problems ($n = 1$) and too busy ($n = 1$) were cited as reasons for withdrawal. Missing participants’ baseline data was carried forward, using intention-to-treat for all calculations. Baseline demographic information and descriptive statistics for the ARRT and CBQ are reported in Colegrove et al (2018).
6.4.2 Correlations between state space grid variables, Assessment of Responsiveness, Reactivity and Turn Taking, and self-report measures

The first aim of this study was to examine relationships between systemic and individual variables with reference to state space grid, observational and self-report variables at Time 1. As shown in Table 7, a large positive correlation was found between tempo transitions and tempo visit entropy, indicating that where dyads moved frequently between different tempi this was strongly associated with unpredictable rhythmic sequences. There was a large positive correlation between responsiveness and reactivity, meaning that parents who were reactive were also likely to be non-responsive during their musical representation of nonverbal conflict interaction (NCI). A moderate negative correlation was found between volume transitions and turn taking, showing that where dyads changed more often between different volumes, parents were less likely to take turns with their adolescent when showing NCI on musical instruments. Reactivity was moderately negatively correlated with tempo transitions (meaning that where parents were more reactive, dyads changed more often between different tempi), and with tempo attractor (meaning that where parents were more reactive, dyads were more likely to represent their conflict as a state of mutual dysregulation, as indicated by a higher tempo attractor score). The CBQ adolescent report was moderately negatively correlated with tempo visit entropy, meaning where adolescents reported higher levels of conflict, this was associated with greater predictability in tempo sequences during dyads’ NCI. The parents’ BTTS: High Betrayal Subscale (under 18 years) had a moderate negative correlation with volume visit entropy and tempo visit entropy, indicating that where parents reported higher levels of childhood abuse within a caregiving relationship, this was associated with more predictable sequences of volume and tempo in their NCI with their adolescent. Volume visit entropy and tempo visit entropy were moderately positively correlated, showing that dyads were quite likely to use both volume and tempo to represent the level of predictability in their NCI.
Table 7 Correlations between State Space Grid Variables, Responsiveness, Reactivity and Turn Taking Scales and Self-Report Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>BTTS</th>
<th>CBQP</th>
<th>CBQA</th>
<th>VAtt</th>
<th>VTr</th>
<th>VEnt</th>
<th>TAtt</th>
<th>TTr</th>
<th>TEnt</th>
<th>Resp</th>
<th>React</th>
<th>TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTTS: High Betrayal under 18 yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBQ - Parent (P)</td>
<td>-0.039</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBQ – Adolescent (A)</td>
<td>-0.236</td>
<td>0.197</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume Attractor (VAtt)</td>
<td>-0.125</td>
<td>0.182</td>
<td>-0.042</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume Transitions (VTr)</td>
<td>-0.034</td>
<td>0.249</td>
<td>0.065</td>
<td>0.009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume Visit Entropy (VEnt)</td>
<td>-0.400*</td>
<td>-0.043</td>
<td>-0.082</td>
<td>0.227</td>
<td>0.171</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tempo Attractor (TAtt)</td>
<td>0.162</td>
<td>0.320</td>
<td>0.054</td>
<td>0.142</td>
<td>0.13</td>
<td>-0.121</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tempo Transitions (TTr)</td>
<td>-0.119</td>
<td>0.103</td>
<td>-0.265</td>
<td>0.167</td>
<td>0.354</td>
<td>0.094</td>
<td>0.118</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tempo Visit Entropy (TEnt)</td>
<td>-0.443*</td>
<td>-0.088</td>
<td>-0.465*</td>
<td>0.192</td>
<td>0.072</td>
<td>0.462*</td>
<td>-0.199</td>
<td>0.514**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsiveness (Resp)</td>
<td>0.043</td>
<td>-0.03</td>
<td>-0.362</td>
<td>-0.204</td>
<td>-0.062</td>
<td>-0.064</td>
<td>-0.375</td>
<td>-0.198</td>
<td>0.004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactivity (React)</td>
<td>0.170</td>
<td>-0.049</td>
<td>-0.258</td>
<td>-0.319</td>
<td>-0.344</td>
<td>-0.182</td>
<td>-0.468*</td>
<td>-0.394*</td>
<td>-0.012</td>
<td>0.678***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn taking (TT)</td>
<td>0.08</td>
<td>-0.295</td>
<td>-0.327</td>
<td>0.034</td>
<td>-0.477*</td>
<td>-0.179</td>
<td>0.107</td>
<td>-0.325</td>
<td>0.213</td>
<td>-0.006</td>
<td>0.264</td>
<td></td>
</tr>
</tbody>
</table>

*Note. CBQ = Conflict Behaviour Questionnaire; BTTS = Brief Betrayal Trauma Survey. *p < .05; **p < .01; ***p < .001 (two tailed)*
6.4.3 Analyses of covariance (ANCOVA) for state space grid variables.

The second aim of this study was to examine whether dyads’ participation in TRM led to changes on state space grid variables. Table 8 shows means, standard errors, confidence intervals and ANCOVA results for attractor, volume and tempo transitions and visit entropy scores. Intervention dyads were significantly more likely to represent their conflict as a mutually regulated state, as indicated by lower volume attractor and tempo attractor scores, meaning that intervention dyads were quieter and slower during NCI at follow-up compared with TAU dyads. There was no significant change in dyads’ movement between volumes (volume transitions), meaning that dyads in both conditions were similar in how often they switched between loud and quiet interactions during their NCI at baseline and follow-up. Dyads in the intervention condition, however, were significantly less likely to switch speeds (tempo transitions) compared with those in the TAU condition, showing that intervention dyads used a more consistent and less changeable tempo during their NCI after the intervention, compared with TAU dyads. Intervention dyads were observed to show significantly more predictability in their use of volume and tempo (volume visit entropy and tempo visit entropy), meaning that their sequences of loud/quiet or fast/slow NCI were more regulated at follow-up compared with TAU dyads.
### Table 8  
**Intervention Outcomes State Space Grid Analyses**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Condition</th>
<th>Baseline</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M/ SE</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attractor</td>
<td>Intervention</td>
<td>2.69/.634</td>
<td>1.31, 4.07</td>
</tr>
<tr>
<td></td>
<td>TAU Control</td>
<td>3.54/.616</td>
<td>2.2, 4.88</td>
</tr>
<tr>
<td>Transitions</td>
<td>Intervention</td>
<td>1.86/.138</td>
<td>1.559, 2.161</td>
</tr>
<tr>
<td></td>
<td>TAU Control</td>
<td>1.92/.192</td>
<td>1.506, 2.344</td>
</tr>
<tr>
<td>^Visit Entropy</td>
<td>Intervention</td>
<td>.44/.042</td>
<td>.374, .521</td>
</tr>
<tr>
<td></td>
<td>TAU Control</td>
<td>.41/.047</td>
<td>.327, .508</td>
</tr>
<tr>
<td><strong>Tempo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TAU Control</td>
<td>3.77/.556</td>
<td>2.56, 4.98</td>
</tr>
<tr>
<td>Transitions</td>
<td>Intervention</td>
<td>TAU Control</td>
<td>^Visit Entropy</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>1.71/.224</td>
<td>1.227, 2.204</td>
<td>2.07/.202</td>
</tr>
<tr>
<td></td>
<td>1.55/.155</td>
<td>1.23, 1.87</td>
<td>2.2/.155</td>
</tr>
<tr>
<td></td>
<td>1.23, 1.87</td>
<td></td>
<td>1.87, 2.52</td>
</tr>
<tr>
<td></td>
<td>5.250*</td>
<td></td>
<td>1, 23</td>
</tr>
</tbody>
</table>

*Note. ANCOVA = analyses of covariance; M = mean; SE = standard error; CI = confidence interval; df = degrees of freedom; TAU = treatment as usual; \(^\) Bootstrapped adjusted M, SE, CIs.

\(*p < .05; \,**p < .01\)
6.5 Discussion Study 3

Using a sample of parents with a trauma history and their adolescent, this study examined relationships between parents’ trauma history, parent-adolescent conflict and other systemic dynamics. The study then examined whether a music therapy intervention focused on teaching skills in nonverbal communication (NVC) and emotion regulation would change these. First, study findings showed that higher levels of parent childhood trauma and adolescent-reported conflict were correlated with more predictability during dyads’ musical representation of nonverbal conflict interaction (NCI), and parents’ reactivity and lack of turn taking were correlated with dyads’ emotional dysregulation and inconsistency during their NCI. Second, it was found that compared with TAU, post-intervention dyads were more emotionally regulated, consistent and predictable during their NCI. Outcomes reported in a previous paper (Colegrove et al., 2018) found that intervention dyads noted significantly reduced conflict in their relationship and showed significantly reduced parent reactivity and increased parent responsiveness compared with TAU. Findings indicate that where a parent has a childhood trauma history, conflictual parent-adolescent dyads may benefit from music therapy intervention that focuses on acquisition of skills promoting emotionally regulated, consistent and predictable NVC sequences. These skills may assist dyads to remain non-reactive and emotionally regulated during conflict interactions, which in turn may enable them to avoid negative escalating cycles that drive and maintain heightened levels of conflict.

The first aim of this paper was to explore relationships between parents’ childhood trauma experiences, intensity and frequency of parent-adolescent conflict, parents’ reactivity and non-responsiveness, and dynamic systems variables. Where parents reported higher childhood betrayal trauma, and adolescents reported higher parent-adolescent conflict, dyads used more predictable volume/tempo sequences during their NCI. Parents who have experienced childhood interpersonal trauma may develop self-protective strategies that function as an attempt to establish a sense of control in a chaotic and threatening environment
They are likely to employ these strategies where they perceive conflict interactions with their adolescent to be chaotic or threatening, and their adolescent may in turn experience these as distressing and indicative of greater conflict intensity (Moed et al., 2014). The entropy measure, originally developed to capture the predictability of sequences in deviant adolescent peer communication and how these may be linked to anti-social behaviour in adulthood (Dishion, Nelson, Winter, & Bullock, 2004) does not distinguish between emotionally regulated or dysregulated sequences (i.e., a sequence characterised by constantly high emotional dysregulation may be considered predictable). In this study, dyads’ unpredictability and inconsistency were strongly correlated. Less consistency was in turn associated with higher levels of parent reactivity (which was strongly correlated with parent non-responsiveness), less turn taking and with dyads’ tendency to musically represent their conflict as a mutually dysregulated state. Together correlations suggest that parents with high betrayal trauma in childhood and their adolescent who are experiencing heightened conflict in their relationship represent their NCI as follows: Where dyads are emotionally dysregulated during their NCI, parents are more reactive and less responsive, and interaction sequences are predictable and inconsistent. These findings are consistent with research that has established links between parents’ childhood trauma history and emotion regulation difficulties including parents’ non-responsiveness or reactivity. These in turn may drive parents’ inconsistent responses and/or controlling parenting strategies in order to establish a sense of safety and predictability during parent-child interaction (Crittenden, 2006b; Maliken & Katz, 2013; Schechter et al., 2014).

The second aim of this paper was to examine whether participation in Tuning Relationships with Music™ (TRM) would lead to changes in the systemic dynamics of dyads’ emotion regulation, consistency and predictability during their NCI compared to treatment-as-usual (TAU). Following participation in TRM, intervention dyads’ tempo was significantly more consistent during their NCI; however, volume consistency remained
unchanged, as measured by *transitions*. These findings suggest post-intervention dyads may have continued to struggle with regulating the volume of their communication during conflict interactions, but were more successful in regulating the tempi of their emotional expressions and responses. Previous state space grid analyses have understood *transitions* as dyads’ ability to switch between different emotional states, and argue that more switching may characterise flexible interactions which support the development of children’s emotional competence (Lunkenheimer et al., 2012). However the current study theorises that for dyads where parents have a trauma history, consistency may indicate an ability to remain emotionally regulated during conflict interaction. Therefore, for the purposes of this study *transitions* is conceptualised as a measure of consistency across temporally sequenced rhythmic or dynamic events, in a similar way that gait may be analysed (Hollenstein, 2013).

Restoring rhythmicity is an area frequently targeted for music therapy intervention where auditory-motor entrainment processes are utilised to retrain behavioural functioning for patients with neurological challenges (Thaut, 2015). Parents with a trauma history may face behavioural and emotional challenges as a result of altered neurological functioning (Musazzi & Marrocco, 2016), and therefore require interventions that assist them to become more consistent in their responses to their adolescent during conflict to establish interpersonal safety. In this study, dyads’ increased rhythmic consistency during their NCI occurred alongside parent and adolescent self-reports that their conflict had significantly reduced, and with clinician-observed increased parents’ non-reactivity, responsiveness and turn taking. In combination with correlations that show a significant relationship between parents’ higher reactivity and greater inconsistency, findings suggest that consistent NVC sequences may represent a positive interactive cycle where a parent’s nonreactive and temporally consistent response enables the dyad to remain emotionally regulated and avoid conflict escalation.

Dyads who had completed TRM showed significantly more predictable NVC sequences, and represented their NCI as significantly more emotionally regulated compared
with TAU dyads. Skills taught in TRM enabled parents to use a quiet/slow-moderate volume and tempo in response to their adolescent, to play at a quieter/slower volume/tempo than their adolescent’s loud/fast volume/tempo, and to match their adolescent’s quiet/slow – moderate volume/tempo in order to prevent conflict escalation and establish responsive interactions. Parents with a trauma history may not have had experiences of safe and responsive communication, characterised by a caregiver’s predictable, consistent and emotionally regulating responses to their expression of emotions (A. N. Schore, 2001). Findings support recommended targets for systemic intervention with traumatised parent-child dyads, namely that providing experiences and teaching skills that promote interpersonal safety may assist parents to be more emotionally regulated and responsive, therefore enhancing their adolescent’s sense of security in the parent-adolescent relationship (van Ee et al., 2015).

6.6 Limitations study 3

This pilot study was not powered to definitively test the effectiveness of TRM, due to difficulties recruiting a sample of parents with an interpersonal trauma history and their adolescents who were experiencing conflict in their relationship. A larger sample size would have improved the ability to establish whether the proposed challenges and mechanisms of change in TRM were significant. Because of the exploratory nature of this study, Bonferroni correction was not made for correlations, which may have resulted in a Type 1 error (i.e., correlations may appear significant when in fact they are not) (Armstrong, 2014). Further research is required to test whether correlations found in this study may be replicated. The first author created and delivered TRM, and conducted all observational measures and coding, which may reduce objectivity of findings. Although measures were subject to IRR checking, and were acceptable for all scales, results should therefore be regarded with caution. The first author, who implemented the intervention, has expertise both as a family therapist and a music therapist. It is not known whether music therapists who are not trained in family systems approaches will be able to deliver TRM. To date, state space grid analysis
has not been utilised in exploring parent-adolescent conflict interactions where a parent has an interpersonal trauma history, or dyadic nonverbal interaction in the music therapy context. Therefore, existing dynamic systems constructs were adapted for the purposes of this study. Further studies may be required, to examine whether these constructs adequately capture the unique challenges and mechanisms of change within traumatised parent-adolescent systems and during dyadic musical interaction, or whether further construct development may be indicated. Self-report measures assessed parents’ and adolescents’ perceptions of their conflict, and parents’ trauma history. Further questionnaires may have elicited useful information about other areas of parent and adolescent functioning relevant to the systemic constructs investigated in this study.

6.7 Conclusion Study 3

This pilot study found that parents with a trauma history and their adolescent who were experiencing high levels of conflict in their relationship musically represented their nonverbal conflict as a mutually dysregulated state, where volume and tempo sequences were predictable and inconsistent. Dyads who participated in *Tuning Relationships with Music*™, a music therapy intervention that targets emotion regulation and nonverbal communication, were more emotionally regulated, consistent and predictable during their nonverbal conflict interaction compared with dyads that received treatment-as-usual. 100% of families who received TRM completed all sessions and follow-up measures, indicating using music to work with parent-adolescent conflict is an appealing and accessible approach to a clinical group who are often difficult to engage and retain in therapy. This study makes a contribution to the existing understanding of the systemic dynamics of parent-adolescent conflict where a parent has a history of abuse or neglect, and suggests that using music to improve emotion regulation, and increase consistency and predictability in nonverbal interaction may reduce conflict in parent-adolescent relationships. Previous research has found that using music to assess nonverbal elements of parent-child interaction provided additional clinical information.
about dyads’ functioning including levels of mutual attunement, NVC skills, and parents’ emotional response when conducted as part of a multi-disciplinary assessment process (S. Jacobsen & McKinney, 2014). The results of this study support this finding and suggest that music may additionally be utilised to obtain detailed information about parent-adolescent nonverbal emotional, autonomic and interpersonal functioning in the context of conflict interaction that may inform clinical assessment and intervention. Further research of this intervention with a larger sample will be useful and will enable greater exploration of the unique dynamics of parent-adolescent dyadic systems where the parent has a history of interpersonal trauma, to determine whether using music therapy to focus on nonverbal emotional processes may improve relational functioning. Findings support the importance of working with families in music therapy, and indicate that music therapy training may benefit from including family systems theory and teaching skills in systemic clinical practice. Music therapists should additionally familiarise themselves with validated and reliable assessment tools that enable them to understand and effectively intervene with somatic and sensory nonverbal processes that may underpin parent-adolescent conflict. Further music therapy intervention development may more closely examine how to effectively assist parents with a trauma history and their adolescents to moderate the volume as well as the tempo of their conflict.
Chapter 7: General Discussion

This thesis examined an intervention for parents and adolescents who were experiencing high levels of conflict, and where the parent had a history of childhood interpersonal trauma. These are families who often struggle to get help or make progress in therapy. Efforts to engage them and work through their conflict to help them relate better are often a huge clinical challenge, and evidence-based interventions with this focus are scarce. This thesis specifically examined whether *Tuning Relationships with Music™* (TRM), a music therapy intervention developed for this research, was efficacious in increasing responsive patterns of relating and reducing conflictual and negative interactions. Improving parents’ emotion socialisation practices (emotion coaching) and adolescents’ mental health was also a target of the intervention. This thesis examined whether focusing on nonverbal aspects of communication may be required in order to regulate physiological (autonomic) and emotional arousal that may underpin parent-adolescent conflict (Zilberstein, 2013). Therefore, the literature about the assessment of nonverbal communication (NVC) was first examined and was followed with a review of NVC and interventions with parent-child relationships. A pilot study (randomised controlled design) then examined whether participation in TRM would increase responsive parent-adolescent interaction and parent emotion coaching, and reduce dyads’ conflict and adolescent mental health difficulties. Systemic theory views the parent-adolescent dyad as a single entity that may be experiencing difficulties, rather than as two separate individuals (Brown, 1999). Therefore, a state space grid analysis of whether emotion regulation, consistency and predictability of volume and tempo changed during nonverbal conflict interaction for dyads who had completed TRM was also conducted (Hollenstein, 2013).

TRM is based on theories that provide an explanation for issues and inform what may be effective treatment for parent-adolescent dyads where parents have experienced a range of challenges consequent to interpersonal trauma at vulnerable times of brain development.
TRM targets dyads’ NVC, emotional and autonomic regulation, and parents’ emotion socialisation practices in order to increase responsive interaction and reduce parent-adolescent conflict. TRM uses musical exercises to teach parents and adolescents skills in nonverbal aspects of emotion regulation, and emotion coaching skills for the parent to respond to their adolescent, as a precursor to teaching verbal skills. Skills taught include identifying, empathically responding to and regulating one’s own emotions, then ‘turning toward’ (i.e., acknowledging) the other and using a ‘softened start-up’ (i.e., quiet/moderate volume) when introducing a topic that may cause conflict. Parents are additionally taught skills in ‘sitting with’ (i.e., responding empathically) their adolescent’s expression of emotion (Gottman et al., 1996), and verbal emotion coaching skills (Havighurst et al., 2012). The findings from the research studies presented in this thesis provide preliminary evidence for TRM’s efficacy in increasing parent-adolescent dyads’ responsive patterns of relating and reducing conflictual and negative interactions. This thesis additionally makes a contribution in that it contains research providing support for applying theories about the effects of childhood interpersonal trauma on parenting and parent-child relationships to intervention with a sample of parents with a trauma history and their adolescent children.

This chapter integrates the findings from the studies presented in this thesis. It begins with a summary of the results, and then presents a discussion of results with reference to key theories and their clinical applications that were outlined in chapter two. Second, the proposed theoretical model, described in chapter two, is re-examined based on the research findings. Next, the implications of the research for addressing parent-adolescent relationships where a parent has experienced interpersonal trauma in childhood are discussed. Finally, the limitations of the research are summarised and directions for future research are proposed.
7.1 Review of Research Findings

The first study presented in this thesis was a review of the literature about NVC, how it is assessed and efforts to intervene with NVC in parent-child interaction. Although a number of reliable and validated assessment tools were found, these were not routinely used to either inform development of interventions for parents and children that targeted NVC directly, or to measure their effectiveness in improving NVC. Additionally, very few evidence-based interventions were found that directly targeted NVC as a method for creating clinical change, especially for parents and their adolescent children. Dyadic interventions utilised music, play and touch in order to work nonverbally with nonverbal processes. Considerable research evidence was found to support the crucial role of NVC in effective parenting and parent-child interaction (Halberstadt et al., 2013), including where parents experience challenges affecting their NVC consequent to childhood trauma experiences (Schechter et al., 2014). The review also showed that further interventions that explicitly assess and address NVC are needed. Recommendations were that existing reliable and validated assessment tools inform intervention development and evaluation.

The second study reported on the outcomes of TRM with parent-adolescent interaction and the adolescent’s mental health. Four research questions were examined with a sample of \( N = 26 \) parent-adolescent dyads experiencing high levels of conflict in their relationship, where the parent had experienced interpersonal trauma in childhood. Dyads were randomly allocated to either TRM or a waitlist condition. Research questions were: 1) Does TRM increase responsive patterns of parent-adolescent relating? 2) Does TRM reduce conflictual and negative escalating cycles of parent-adolescent interaction? 3) Does TRM increase parents’ emotion coaching? 4) Does TRM improve mental health outcomes for adolescents? The results showed that participation in TRM increased emotionally responsive interactions between parents and adolescents, and reduced conflict and parents’ reactivity compared with those in the waitlist condition. Although adolescents and parents reported
improvements in the adolescent’s mental health, and parents reported they were less punitive and more encouraging of their adolescent’s emotional expressions when compared with control dyads, these changes were not statistically significant.

Study 3 expanded on Study 2, by investigating parent-adolescent dyads as a single dynamic system during nonverbal conflict interaction, rather than considering parent and adolescent as two independent participants. Specifically, aims were 1) to examine relationships between parents’ trauma history, parent-adolescent conflict, parents’ reactivity and responsiveness, and parent-adolescent dyads’ emotion regulation, consistency and predictability during nonverbal conflict interaction; and 2) to discover whether TRM’s focus on NVC and emotion/autonomic regulation would impact post-intervention dyads’ nonverbal conflict interaction compared with dyads in the control condition. State space grid analyses found that where parents reported higher levels of relational trauma in childhood and adolescents reported higher levels of parent-adolescent conflict, dyads were emotionally dysregulated and predictable during their nonverbal conflict interaction. Dyads who received TRM were more emotionally regulated, consistent and predictable during the nonverbal conflict interaction assessment task post-intervention compared with those in the control condition. Results of study 3 have important implications for understanding the relational dynamics for parent-adolescent dyads where parents have experienced childhood interpersonal trauma. Results additionally suggest that a systemic approach integrating ‘bottom up’ and ‘top down’ approaches may be beneficial for conflictual parent-adolescent dyads where parents have an interpersonal trauma history.

The following section will examine the results with reference to key theories of the effects of childhood interpersonal trauma on parenting and parent-adolescent relationships.
7.2 Nonverbal Communication

This thesis finds support for the proposal that NVC needs to be addressed in order to assist parent-adolescent dyads where parents have an interpersonal trauma history to increase responsiveness and reduce reactivity during conflict interaction. NVC skills include a parent’s ability to recognise, accurately interpret and sensitively respond to their child’s emotional expressions. Interventions may therefore target NVC in order to support effective and sensitive parenting, and improve parent-child relationships and children’s behaviour (Casey & Fuller, 1994; Moed et al., 2014).

Study 1 reviewed interventions that addressed NVC either directly, or as part of a verbally focused approach for parents and children, including those experiencing clinical difficulties. Where interventions with parent-child dyads directly addressed NVC, post-intervention parents reported and were clinically observed to be more competent and less stressed in their parenting, children’s internalising symptoms were reduced, social communication was improved, and parent-child interaction was more positive compared with those in the control conditions (S. Jacobsen et al., 2014; Siu, 2009, 2014). Where interventions targeted parent-child NVC as part of an overall approach, post-intervention parents reported less rigid parenting attitudes, a greater sense of well-being, and were more aware and responsive to their children’s emotions. Children had reduced mental health and behavioural problems including reduced PTSD symptoms; and parent-child interactions showed improved relationship functioning compared with controls (Coatsworth et al., 2010; Coatsworth et al., 2015; Dawe & Harnett, 2007; Havighurst, Duncombe, et al., 2014; Havighurst et al., 2010; Havighurst et al., 2013; Kehoe et al., 2013; Lieberman et al., 2005; Lieberman et al., 1991; Wilson et al., 2012).

TRM directly targets NVC by using musical exercises to teach parents and adolescents skills in recognising, safely communicating and responding to nonverbal somatic and sensory expressions of emotion. For example, parents are taught to ‘sit with’ their
adolescent’s expression of emotion by playing an instrument at a moderate tempo and quiet volume, and to stop when the adolescent plays their instrument in order to nonverbally communicate acceptance, empathy and a willingness to listen. Parents and adolescents are both taught nonverbal elements of ‘softened start up’ when raising an issue that may cause conflict by playing instruments at a quiet-moderate volume/tempo.

TRM views NVC as a particularly important target for parent-adolescent dyads where the parent has experienced interpersonal trauma in childhood, as adverse early life experiences are thought to interfere with processes that allow nonverbal information to be clearly understood or communicated (Berenbaum, 1996; Jelenik et al., 2006). A parent’s ability to recognise, interpret and sensitively respond to their adolescent’s nonverbal cues that indicate their emotional state and experience (Schechter et al., 2006) may therefore be compromised. This may then in turn affect their adolescent’s NVC, as the parent-child relationship is the main environment where NVC patterns are learned and reinforced (Magill-Evans et al., 1995). TRM teaches NVC skills in a sequence that supports parents and adolescents to become aware of and manage the somatic and sensory cues within their own body that may be regarded as a form of nonverbal internal communication (e.g., sensing tightness in the chest may be understood as a NVC from the body to the brain that an environmental event is being experienced as frightening). This is viewed as a necessary first step before supporting parents to become aware of, accurately interpret and sensitively respond to their adolescent’s NVC.

Study 2 found that post-intervention parents were clinically observed to significantly improve their NVC toward their adolescent, and that this was associated with parents being less reactive, more responsive and more likely to take turns during nonverbal conflict interaction. With parent and adolescent reports these changes were associated with less conflict in their relationship compared with dyads in the control condition.
Study 3 additionally found that post-intervention dyads used significantly quieter volume and tempo compared with control dyads, and this was theorised to be representative of more co-regulated emotional and physiological states. These in turn were associated with greater consistency and predictability during nonverbal conflict interaction.

Together, study 2 and study 3 results suggest that teaching parent-adolescent dyads NVC skills that attend to volume and tempo levels and turn taking within an emotion coaching framework (Gottman et al., 1996; Havighurst et al., 2012) may allow dyads to experience nonverbal conflict interaction as a regulated, nonreactive and responsive space where issues may be safely addressed. Results additionally suggest that teaching NVC skills may provide participants with an internal template for responsive interaction that they can use to recognise and therefore avoid escalation during conflict.

7.3 Cognitive, Emotional, Neurobiological and Relational Challenges

TRM was designed to address the cognitive, emotional, neurobiological (autonomic) and relational challenges for parents with a childhood interpersonal trauma history and their adolescent children. TRM provides resources and teaches skills designed to improve cognitive functioning (e.g., psycho-education about beliefs and attributions that support emotional competence), emotion regulation (e.g., musical exercises to support emotion awareness and responsiveness for parent and adolescent); emotion coaching to assist the parent in helping their adolescent regulate their emotions, autonomic regulation (e.g., music that supports diaphragmatic breathing) and relational functioning (e.g., musical exercises that teach parents and others to turn toward the other’s ‘softened start-up’ about an issue). Skills and resources aim to support responsive and non-reactive communication during conflict interaction.

In Study 2 of this thesis, parents in the intervention condition were observed to be less reactive and more responsive toward their adolescent during a music-based assessment of nonverbal conflict interaction. Both parents and adolescents in the intervention condition
reported reduced conflict in their relationship compared with control dyads. However, significant improvements were not found in parents’ emotion coaching or adolescents’ mental health, although these approached significance and may have been due to the small sample. These results may also have not achieved significance because they were not the main focus, which was using music as a resource to alter nonverbal interaction patterns that may cause conflict.

Parents’ lack of statistically significant change in using emotion coaching may also reflect a limitation of a music-based approach. That is, a focus on modifying autonomic processes (i.e., rapid breathing, heart-rate) that underpin emotional dysregulation may not be sufficient in itself to change parents’ ability to use emotion coaching skills. These may require more intensive verbal coaching, as is provided for example in the evidence-based Tuning in to Teens parenting program (Havighurst et al., 2012). The lack of improvement in adolescents’ mental health may further reflect this limitation. Adolescents’ satisfaction with the parent-adolescent relationship has been linked to better adolescent mental health outcomes (Morris et al., 2007). However, research supports the link between parents’ emotion socialisation (emotion coaching) practises and adolescents’ ability to regulate their emotions which may affect their mental health, rather than parents’ emotion regulation capacity alone (Bariola, Gullone, & Hughes, 2011; Katz et al., 2012). Parents’ clinically observed reduced reactivity and increased responsiveness occurred alongside reports from parents and adolescents that their relationship was less conflictual. This finding suggests that using music to regulate autonomic processes during parent-adolescent conflict interaction may positively influence their thoughts about their conflict interactions.

Study 3 found that where parents reported a higher level of childhood interpersonal trauma in the context of a caregiving relationship, this was associated with more predictable parent-adolescent conflict interaction. Conflict interactions were also characterised by parents’ high levels of reactivity and lack of turn taking, which in turn were correlated with
dyads’ emotional dysregulation and inconsistency. These findings support theoretical understandings that indicate parents with an interpersonal trauma history may experience cognitive, emotional and/or neurobiological disturbances that mean they have difficulty responding sensitively to their children (Schechter et al., 2014); that emotionally dysregulated parents may attempt to impose a sense of predictability through controlling or intrusive parenting strategies when they perceive conflict interaction as threatening (Crittenden, 2006b; Kliewer et al., 2016); and that intervention for parents with a trauma history needs to pay specific attention to parents’ trauma triggering causing disturbances in cognitive, emotional and autonomic functioning that may be activated within the parent-child relationship (van Ee et al., 2015).

Study 3 additionally found that post-intervention dyads were more emotionally regulated and predictable during the nonverbal conflict interaction exercise compared with control dyads. However, while post-intervention dyads were more consistent in their use of tempo, their volume remained at the same level of consistency. TRM is designed to assist parents to remain nonreactive or responsive where interactions reminiscent of past trauma may occur during conflict with their adolescent. TRM also aims to support parents to return after trauma memories have been activated to a regulated state that may support consistency and predictability during parent-adolescent conflict interaction. Music is thought to have the capacity to work directly with autonomic processes that may underpin emotional dysregulation; however, it has not been established that music therapy targeting autonomic processes may positively impact emotional regulation (Ellis, Koenig, & Thayer, 2012). This limitation is reflected where dyads achieved rhythmic consistency, as measured by their tempo, but did not change in the consistency of their volume. This finding suggests that dyads may have experienced a greater capacity to regulate autonomic rather than emotional arousal during their nonverbal conflict interaction.
7.4 Attachment

TRM, while not designed to address attachment issues for adolescents where their parents have experienced childhood interpersonal trauma, targets aspects of functioning that may have been negatively influenced by early childhood attachment experiences (Crittenden, 2006b). TRM may affect some of these processes (e.g., the expectation that others will be hurtful during conflict, or the capacity to regulate emotions during conflict interaction), therefore allowing experiences of interpersonal safety to develop. Experiencing an internal sense of safety and providing a sense of interpersonal safety may feel like an impossible task for parents who have not experienced safety during their own childhood as a consequence of abuse or neglect within the caregiving relationship (Lyons-Ruth & Block, 1996). TRM aims to provide dyads with experiences of safety during parent-adolescent conflict interaction in order to shift maladaptive patterns of interaction that parents may have developed in childhood in order to keep themselves safe. These patterns of interaction may then in turn perpetuate a feeling of danger for both parents and adolescents. This approach is based on Crittenden’s premise that parents will only feel they are able to abandon maladaptive patterns that functioned in childhood to provide a sense of safety when they are equipped with other ways to feel safe, and where they feel it is safe to do so (Crittenden, 2006b). Attachment was not measured in this thesis. However, results suggest that a focus on providing safety (via teaching skills that regulate processes driving conflict) and supporting responsive and nonreactive communication may assist dyads where a parent’s history of interpersonal trauma has influenced their early attachment experiences.

7.5 Mentalisation

This thesis provides support for previous research that has shown that parents’ mentalising capacity may be disabled when the flight/fight/freeze response is activated in response to traumatic memory re-experiencing that may be triggered by parent-adolescent conflict interaction (Schechter et al., 2005). Further, mentalising may be enhanced by
strategies that promote management of autonomic and emotional arousal (Asen & Fonagy, 2012a). Mentalising was not specifically measured in this thesis. However, aspects of mentalising (e.g. asking parents to be curious about their adolescent’s emotional experience, and to accept that adolescents’ emotions and intentions during conflict interaction may differ from their own) were targeted in the intervention. Outcomes suggest that changes occurred in line with this theory. Adolescents who completed TRM reported significantly lower levels of conflict in their relationship with their parent compared with control adolescents. They were therefore more likely to endorse items including that their parent is able to understand their side of an argument, and is considerate of the adolescent’s feelings (Prinz et al., 1979). Post-intervention adolescent reports indicate that compared with those who did not complete TRM, post-intervention parents may be better able to accept and appreciate their adolescent’s subjective experiences. Parents may also be less likely to attribute negative intentions to their adolescent, all factors that may suggest parents’ mentalising capacity improved (Sharp & Fonagy, 2008). Further research to explore whether TRM directly impacts mentalising would be useful.

7.6 Review of the Theoretical Model

Based on the research literature presented in chapter two, a theoretical model was proposed to explain how TRM would address parent-adolescent conflict (P-A conflict) for dyads where a parent has a history of childhood interpersonal trauma. It was theorised that TRM would facilitate change in dyads’ functioning during conflict interaction by integrating ‘top down’ with ‘bottom up’ methods within a systemic framework. The model also considered the bidirectional relationships between parents’ and adolescents’ internal and interpersonal cognitive, emotional and autonomic processes that may influence conflict interaction.

The research conducted in this thesis tested the model and found it to be partially supported. Study 2 found that post-intervention dyads reported significantly reduced conflict,
and parents were significantly less reactive and more responsive during nonverbal conflict interaction. Study 3 found that post-intervention dyads were more emotionally regulated, predictable and consistent in their use of tempo during their nonverbal conflict interaction. These findings support the model, suggesting that cognitive, emotional, autonomic and interpersonal functioning during P-A conflict can be effectively addressed integrating ‘top down’ and ‘bottom up’ methods within a systemic approach.

Parents’ emotion socialisation (emotion coaching) practices and adolescents’ mental health (strengths and difficulties) did not significantly improve, therefore not supporting the model. One explanation for these results is that parents did not have enough time to learn verbal emotion coaching skills during TRM, which may have positively impacted adolescents’ mental health. TRM is predominantly focused on teaching NVC, however adding further ‘top down’ (therapist coaching and psycho-education) sessions to TRM that give parents more time to master verbal emotion coaching skills may have improved results and therefore provided stronger support for the model.

However, another possibility is that TRM did not attend to all possible internal and interpersonal relationships between parents’ and adolescents’ cognitive, emotional and autonomic processes. These may affect parents’ capacity to use emotion coaching strategies and therefore support their adolescents’ sense of safety during conflict interaction (which in turn may positively affect their mental health). A theoretical model that better explains these relationships may therefore be required. Based on clinical application of theories reviewed in chapter two, the model describes ‘top down’ and ‘bottom up’ intra-personal relationships in a linear fashion. An assumption of linearity suggests that cognitions affect emotions, which in turn affect autonomic processes; or conversely autonomic processes affect emotions, which in turn affect cognitions. The model does not, however, consider a direct bidirectional relationship between autonomic and cognitive processes. This relationship may be suggested in theories that link automatic action sequences to cognitive appraisal of social situations.
(Bargh & Ferguson, 2000), or the involvement of premotor neurological processes such as embodied simulation in social cognition (Gallese, 2009).

The model additionally shows relationships between each of these processes and P-A conflict interaction but may be incomplete in that it does not specifically consider all possible interpersonal bi- and/or multidirectional relationships. For example, parents’ autonomic processes and adolescents’ emotions may mutually influence each other and create their own negative escalating cycle. A manifestation of this may be that a parent’s fight response is activated by her adolescent’s expression of anger, meaning that her frontal lobe functioning is reduced and she is unable to regulate her physiological state (Rauch et al., 2006). She then experiences a rapid tempo within her body (i.e., elevated heart rate and breathing) and this automatically alters and dysregulates the tempo of her NVC (i.e., speech rhythm). Therefore she may speak quickly at the same time as her adolescent, resulting in the adolescent feeling more angry and therefore raising his voice even louder. This in turn further activates the parent’s autonomic fight response, causing her to experience an even faster internal rhythm and therefore speak more rapidly to her adolescent while he is speaking, which then causes the adolescent’s anger to further intensify.

An adolescent’s emotional expression and parents’ cognitions may also mutually influence each other and in turn create a negative escalation. For example, an adolescent’s fear means he does not speak, which is interpreted by his parent as aggressive due to her trauma-activated memory of a caregiver becoming silent just before he physically assaulted her. The parent may then accuse her adolescent of having an aggressive intention, which causes the adolescent to feel more frightened and experience further difficulty speaking when his parent asks him a question.

Combinations of intra- and interpersonal multidirectional sequences may also become negative escalating cycles of interaction. For example, a parent’s trauma-related autonomic fight response means she experiences tension in her throat and diaphragm, causing her to
become emotionally distressed and therefore raise the volume of her voice when talking with her adolescent. This may cause the adolescent to feel frightened, perceive their parent as threatening, and physically retreat. The adolescent’s retreat may trigger trauma-related memories of neglect/caregiver withdrawal for the parent who then experiences further body tension, feels angry and raises the volume of her voice even more.

Dynamic systems theory considers relationships between individuals to be recursive and multi-directional, including in the context of attachment relationships and relational trauma (Crittenden, 2009). This theory may assist in a modification of the proposed theoretical model in order to more accurately reflect the complexity of relationships between dyads’ cognitions, emotions and autonomic responses as described above.

Findings from study 3 may provide some support for this modification. Parents’ lack of turn taking during the nonverbal conflict interaction assessment task was correlated with parents’ reactivity, and with dyads’ emotional dysregulation and inconsistency (measured by volume, tempo and turn taking while playing musical instruments). This suggests that parents’ and dyads’ autonomic responses and emotional dysregulation were interacting in ways that may be considered multi-directional and recursive. For example, a parent’s lack of turn taking may be emotionally dysregulating for their adolescent, who then plays their instrument more loudly. The adolescent’s loud instrument playing may then trigger a parent’s memories of abuse, causing them to experience muscle tension, feel angry and consequently play their instrument loudly over the top of their adolescent’s music playing.

Study 3 also found that post-intervention dyads were more emotionally regulated, consistent in tempo and predictable during their nonverbal conflict interaction compared with dyads in the control condition, however the consistency of their volume remained unchanged. This finding may support modification of the proposed theoretical model if the tempo of instrument playing is considered indicative of autonomic arousal. For example, a sudden change from moderate to quick tempo may represent somatic activation of the fight/flight
response, or a sudden drop in tempo may indicate somatic activation of the freeze response. However, the inability to keep volume at a consistent level may be considered more indicative of emotional dysregulation. For example, an abrupt shift from moderate to loud volume may suggest anger has become dysregulated, or a sudden drop in volume may mean that fear has intensified. This could indicate that assisting dyads to regulate intense bodily sensations in response to conflict interaction does not in itself help them to manage their emotional response, even though it may assist them to shift their cognitions about each other and the relationship. In this thesis, post-intervention parents and adolescents reported cognitions that the level of conflict (measured by the Conflict Behaviour Questionnaire) in their relationship had significantly reduced, compared with those in the control condition. Changed cognitions in turn may reduce emotional reactivity or improve responsiveness. Therefore results may provide further support for a systemic perspective. Dynamic systems theory views non-linear multidirectional and recursive processes (including nonverbal interactions) as central to either exacerbation or reduction of P-A conflict escalation (Hollenstein & Lewis, 2006), and therefore as a target for intervention (Lunkenheimer et al., 2012).

Results may further suggest that intervention based on a modified theoretical model, shown in Figure 5, may need to be informed by detailed assessment (i.e., chain analyses) of dyads’ nonverbal and verbal conflict sequences in order to distinguish between and therefore target specific interactive processes. For example, dyads’ conflict interaction may be characterised by quick tempo, moderate volume and partial turn taking (e.g., speaking quickly and somewhat quietly to each other, while allowing the other to speak uninterrupted some of the time), preceded and/or followed by negative statements about each other. These dyads may need assistance with autonomic regulation (i.e., techniques that help slow down breathing and/or heart-rate during conflict interaction) and cognitive strategies (i.e., psycho-education and coaching about how to interrupt a negative escalating cycle). Alternatively,
dyads’ conflict interaction may comprise a lack of turn taking combined with loud volume (e.g., they talk loudly over the top of each other), accompanied by positive statements about each other even though they experience difficulties during conflict interaction. For these dyads, a stronger focus on emotion regulation and co-regulation strategies may be required (i.e., teaching awareness of and responsiveness to one’s own feelings; teaching parents to ‘turn toward’ and ‘sit with’ the adolescent’s feelings).

Figure 5 shows how these modifications (shown with orange arrows) may be incorporated into the theoretical model proposed in chapter two. The model has been expanded to consider a direct relationship between parents’ and adolescents’ intrapersonal cognitive and autonomic processes in addition to previously identified ‘bottom up’ and ‘top down’ relationships. All possible interpersonal connections between parents’ and adolescents’ cognitive, emotional and autonomic processes are also displayed. Dyads’ volume has been included as part of emotional functioning, rather than as part of autonomic functioning in the initial model. The large orange arrow shows that in addition to using existing systemic approaches to address P-A conflict (as shown in the middle section), systemic assessment and intervention may specifically identify and target non-linear interaction sequences.

This revised model may inform assessment and intervention in a number of ways. First, assessment should comprise detailed chain analyses of dyads’ nonverbal interaction sequences, in order to determine which areas of intra- and interpersonal functioning need to be targeted in intervention. Dimensions of volume, tempo, turn taking, parent reactivity and responsiveness (see Appendix C for a detailed description of these scales) may inform this assessment; however additional information may also be required. Each of the aforementioned dimensions could be analysed to determine how they move through time. Questions to guide analyses may include: Do conflict interactions begin quietly and slowly, or loudly and quickly? At what time points is a parent more or less reactive or
Figure 5: Revised Model: Theorised mechanisms influencing parent-adolescent conflict interaction.
non-responsive? What happened immediately before the parent’s reaction? Was the preceding event intra- or interpersonal – i.e., was the parent triggered by an internal/somatic or external/sensory event such as an adolescent’s loud volume?

Assessment may need to include discussion with parents and adolescents in order to conclusively determine “cause and effect” phenomena. For example, the therapist may show a parent video feedback of their nonverbal representation of conflict on musical instruments, pause the video at a point where the parent suddenly played at the same time as their adolescent, then point out to the parent a number of events that occurred immediately preceding this. For example, the adolescent may have played more loudly, indicating the trigger was interpersonal. Alternatively, the parent’s playing may have become very rapid and less rhythmic, indicating that an internal somatic trigger may have preceded the behaviour being discussed. If the parent is unaware of which event preceded their sudden shift to playing over their adolescent, then further assessment may be conducted (i.e., the therapist may gently enquire about the parent’s experience of conflict as a child with their caregiver).

Where further assessment may be contra-indicated (i.e., evocative of unprocessed trauma memories that should not be discussed at this stabilisation stage of therapy) then the therapist may proceed with several hypotheses that can be tested during intervention. For example, if the trigger is internal/somatic, the parent will benefit from being taught ways to become aware of their altered breathing or pulse during nonverbal conflict interaction, recognise that this causes them to play at the same time as their adolescent, then learn skills that enable them to regulate their autonomic response. If the trigger is interpersonal, the parent will benefit from exercises that encourage the adolescent to express their emotions on a musical instrument, communicate what emotion is being expressed, and learn ways of regulating their own response and then responding to the adolescent’s emotional expression in a way that the adolescent identifies as helpful. (N. B. It is worth noting here that
adolescents are also taught emotion and autonomic regulation skills, and ways of expressing and communicating their emotions that are respectful and may therefore be experienced as safe by the parent).

Next, intervention should be adjusted in response to the particular challenges identified in the previously described assessment process. The example given earlier gives one possibility for how this may occur.

Intervention informed by the revised theoretical model may additionally specifically investigate the link between parents’ and adolescents’ thoughts and body sensations in addition to links between other internal and interpersonal processes, in order to understand their conflict dynamics. This may be done by using methods described in chapter 3. For example, during an exercise where an adolescent is asked to play their representation of an emotion on a musical instrument, the parent could be asked questions such as “What happens in your body when your adolescent plays their instrument like that? What thoughts do you have about your adolescent/your relationship when you have those body sensations?” In later sessions, when parents and adolescents are practising sequences of nonverbal interaction (i.e., negative escalating cycle, stop, regulate emotional/autonomic response, ‘turn toward’) the therapist may assist them to maintain an awareness of the physical sensations that accompany each step, and how these may alter the cognitions they have about each other and their interaction. For example, a negative escalating cycle characterised by loud and quick playing may mean that an adolescent experiences tightness in his chest and thinks “My Mum doesn’t listen to me. She doesn’t care what I have to say”. However, further on in the sequence, when the parent has paused briefly and then turned toward the adolescent, the adolescent may experience a sensation of lightness in his chest, and thinks “My Mum is listening to me, she cares”.

In addition to information about other links between cognitive, emotional and autonomic processes, this can then be used to reinforce the value of practising new skills.
Dyads may be encouraged to experiment at home, to further discover their own links between body sensations that occur in response to the other’s emotional expression, their thoughts about each other and their relationship, and then how this may affect their emotions and nonverbal communication.

7.7 Clinical and Practical Implications

The results of this thesis have a number of clinical and practical implications for intervention with parent-adolescent dyads experiencing high levels of conflict in their relationship, where the parent has a history of interpersonal trauma in childhood. The effectiveness of TRM in reducing conflict and improving responsive interactions suggests that a focus on NVC may be helpful when intervening with a clinical sample who often do not benefit from verbally-focused interventions (Maliken & Katz, 2013). Results additionally suggest that the use of music as a way of working with NVC may be effective, and that music may be perceived as a helpful and manageable approach by a client group who are often difficult to engage and/or retain in clinical practice (Imel et al., 2013).

Although parent-adolescent conflict is routinely addressed with systemic interventions, these have not been empirically tested for dyads where parents have an interpersonal trauma history (A. Carr, 2014). Evidence-based systemic approaches do not utilise methods that directly address nonverbal or dysregulated autonomic/emotional interpersonal processes that may perpetuate heightened conflict. Systemic interventions routinely address multiple interconnecting levels of parent-adolescent interaction (e.g., teaching dyads about the connection between a parent’s punitive response to an adolescents’ heightened emotionality that may contribute to conflict escalation as a precursor to providing them with psycho-education and skills in order to interact differently - Kaslow et al., 2012). Therefore, systemic intervention principles may be readily extended to encompass nonverbal and autonomic intra- and interpersonal dimensions of parent-adolescent interaction.
Results reported in study 3 also have important clinical and practical implications. Correlations combined with pre/post intervention results suggest that the evaluation of musical dimensions such as volume and tempo may provide unique information about dyads’ conflict interaction and what variables may influence this. Previous research has found that using music to assess nonverbal elements of parent-child interaction provided additional clinical information about dyads’ functioning including levels of mutual attunement, NVC skills, and parents’ emotional response when conducted as part of a multi-disciplinary assessment process (S. Jacobsen & McKinney, 2014). The results of this thesis support this finding and suggest that music may additionally be utilised to obtain detailed information about parent-adolescent functioning in the context of conflict interaction that may inform clinical assessment and intervention.

Results additionally suggest that clinicians working with parent-adolescent conflict, where the parent has an interpersonal trauma history, should be routinely assessing the contribution of nonverbal autonomic, emotional, and relational as well as cognitive processes to how conflict interaction is maintained. Study 1 identified a number of reliable and validated NVC assessment tools that may be used to gain an understanding of problems and inform intervention, and clinicians should familiarise themselves with these. Clinicians may also integrate existing 'bottom up' therapies identified in chapter 2 into their practice, in order to directly intervene with somatic and sensory processes that may influence parent-adolescent conflict. Integrating these approaches within a systemic framework may enable nonverbal interpersonal processes to be directly addressed clinically. Although TRM uses music to intervene with these aspects of functioning, play and body-focussed approaches may also be useful, and provide a way of working that is manageable and appealing to parents and adolescents.
7.8 Strengths and Limitations of the Studies Presented in this Thesis

Strengths and limitations specific to the three studies have been discussed in chapters 4, 5, and 6 of this thesis and are summarised here. Study 1, which reviewed how NVC is assessed and targeted for change in interventions with parent-child relationships, examined a topic that has not been reviewed in previous publications, and provided useful information that informed the development of TRM. In study 2 100% of participants allocated to the intervention condition were retained in the study. In contrast to other published intervention studies that report moderate-high dropout rates, all intervention dyads completed TRM, and fidelity checklists further indicated that dyads received 100% of the intervention content. Although a small sample was recruited meaning that it is not possible to generalise results to other studies, a number of different socio-economic groups, family configurations and ethnic populations were represented (see Table 4). Self-report data was collected from both parents and adolescents, and dyads’ observational data was additionally collected, allowing examination of adolescents’ as well as parents’ perception of change in the parent-adolescent relationship and their mental health, as well as clinical observation of changes. The randomised control design enabled comparison with a control group, which in turn allowed conclusions to be drawn about the efficacy of TRM in reducing parent-adolescent conflict and adolescent mental health difficulties, and increasing parents’ responsiveness and emotion coaching. The use of state space grid analysis in study 3 allowed dyads to be observed as a single dynamic entity rather than as two separate individuals, thereby enabling the relationship between systemic and individual variables to be considered, and whether participation in TRM resulted in systemic change during conflict interaction.

However there were also a number of limitations to each study. Study 1 used search criteria within English language publications that yielded only a small number of interventions that focussed on NVC. More interventions may have been found if different search terms were used. If the search had been widened to include studies published in other
languages other interventions that included a focus on NVC may have additionally been located. Another limitation of the review was that it was difficult to determine which programs may have addressed NVC where this was not made explicit in publications describing research outcomes. Together these limitations mean that potentially existing evidence-based interventions that focus on NVC with parent-child relationships were not discovered, that might have further informed the development of TRM.

Study 2 was limited by small sample size; a larger sample would have improved the power to detect differences between intervention and control participants. This population of dyads who are often hard to engage and retain in therapy was very slow to recruit, and it was beyond the scope of this thesis to continue with recruitment due to time and funding constraints. Further studies may allow more time for recruitment, in order to obtain a larger sample. Boys were more likely than girls to decline to take part in the study, and only one father participated, which may have reflected challenges that referring services have in successfully engaging fathers (Tehan & McDonald, 2010) especially where there is conflict involved. Future studies should investigate the efficacy of TRM with a larger sample, explore how to more successfully engage boys in TRM, and endeavour to include more fathers, in order to examine whether TRM works equally well for fathers as well as mothers.

The author of this thesis was the creator of TRM, and the clinician delivering both assessment and intervention, which may have meant that findings were not objective. This was addressed by asking two clinicians who were unaware of whether dyads were in the intervention or control group, or whether the assessment was pre- or post-intervention, to complete inter-rater reliability coding for the assessment measures. Ratings showed acceptable/high reliability across additional coders. However, results should nonetheless be interpreted cautiously. Future studies should ensure the roles of researcher, assessor and therapist are separated in order to reduce the potential for any bias in the evaluation process.
TRM focused on the acquisition of NVC skills; therefore only two sessions were allocated to teaching parents verbal emotion coaching skills. Additional sessions may have given parents time to learn verbal emotion skills which may have helped them reduce dismissive or punitive responses to their adolescent, which in turn may have improved their adolescent’s emotional and/or behavioural difficulties. Further studies should assess whether adding additional sessions to TRM would improve parent emotion coaching and adolescent mental health difficulties. Alternatively, further research might also examine whether modifying TRM as informed by the revised theoretical model proposed in this thesis and described earlier in this discussion may change outcomes for parents’ emotion coaching and consequently adolescents’ mental health.

This thesis did not examine whether benefits from participating in TRM were maintained, decreased or improved over time. It is possible that relationship changes occur at a slower rate for parent-adolescent dyads where the adolescent is going through a time of developmental transition (McGue et al., 2005). An adolescent’s developmentally normative emotionality and assertion of independence may be triggering for parents with a history of childhood trauma, meaning that negative interaction patterns driving conflict may become further entrenched during adolescence, and therefore take longer to shift (van Ee et al., 2015). Awareness of automatic patterns in order to interrupt them and learn new interactive cycles is an important first step, but it may take many repetitions before new patterns of response are consolidated. An adolescent’s experience of their parent’s consistent responsiveness over a longer time may in turn positively impact their mental health. Further studies may ask parents and adolescents to complete additional measures at a later time in order to assess whether gains are maintained, or whether they improve or lessen over time.

Correlations in study 3 were not adjusted with a Bonferroni correction, in order to avoid lack of precision and Type 2 error (i.e., not detecting significant relationships between variables). However Type 1 error may have occurred as a consequence (i.e., correlations may
appear significant when in fact they are not). Further studies should determine whether correlations may be replicated. Study 3 adapted existing dynamic systems constructs for the purposes of analysis, as state space grid analysis has not been previously utilised to analyse the effectiveness of an intervention addressing parent-adolescent conflict where a parent has a history of childhood interpersonal trauma, or nonverbal dyadic interaction in the music therapy context. Further studies may examine whether each of these constructs accurately capture the challenges and mechanisms of change within traumatised parent-adolescent dyadic systems, or whether further construct development may be required.

7.9 Future Directions

This thesis has provided preliminary information about the efficacy of using TRM to reduce conflict interaction and parents’ reactivity, and to increase parents’ responsiveness during parent-adolescent conflict interaction. In addition to suggestions about how further studies could address the limitations of this thesis outlined in the previous section, future research may build upon this initial work. TRM could additionally be tested to determine the acceptability and feasibility of the intervention, in order to explore barriers and enablers for dissemination of the intervention. Qualitative research methods (i.e. participant interviews, self-report evaluation measures) could assess: Did participants like TRM? What did they not like? What would they suggest changing? What was most helpful? Would they recommend TRM to others? Was TRM an effective adjunct or precursor to their ‘treatment as usual’? This data may be important in order to determine whether there is sufficient buy-in from participants and future clients (especially adolescents). Studies may examine whether using music to address NVC and autonomic/emotional regulation within a systemic framework is efficacious for larger samples of parent-adolescent dyads where parents have a childhood interpersonal trauma history. Further studies may also examine whether this focus may be helpful for other clinical groups where these difficulties may contribute to conflict and relationship problems.
Further research would ideally test hypotheses generated in response to correlations and outcomes found in this thesis. This study was underpowered to examine more complex relationships between variables – for example, mediational analyses where pathways from betrayal trauma to conflict to nonverbal communication may be hypothesised. A larger-powered study, using preliminary data from this research, may fully examine these pathways, in order to understand mechanisms that drive conflict for parent-adolescent dyads where parents have an interpersonal trauma history. For example, studies may examine relationships between parents’ and adolescents’ autonomic responses and their cognitions. Correlations between musical elements such as volume and tempo and how accurately these may reflect parents’ and adolescents’ levels of emotional regulation, consistency and predictability during their nonverbal conflict interaction may also be explored. Future research may also measure outcomes of TRM, and/or compare assessments of parents’ and adolescents’ nonverbal conflict interaction as measured in this thesis with assessments derived from existing validated observational tools used to measure and analyse nonverbal aspects of parent-adolescent verbal conflict interaction, i.e., the Specific Affect Coding System (Coan & Gottman, 2007; Hollenstein & Lewis, 2006). Analysis could determine if these are capturing similar constructs, or whether unique information is obtained when asking dyads to represent their conflict nonverbally using musical instruments.

Further assessment and intervention development informed by the theoretical model proposed in this thesis is also indicated. Assessment tools may need to be developed that can examine the nonverbal and autonomic aspects of parent-adolescent conflict interaction whilst also considering emotional and cognitive processes. Existing validated and reliable assessment tools identified in study 1 may be revisited in order to ascertain whether they may be adapted for this purpose. For example, Jacobsen’s Assessment of Parent-Child Interaction (APCI), which utilises music to assess NVC in parent-child dyads where children aged 5-12 years are at risk of emotional neglect, may be modified to 1) assess parent-adolescent NVC,

The assessment tools developed for use in this thesis (Appendix C) may additionally inform assessment development and should be subjected to further reliability and validity testing. Although preliminary interrater reliability, internal consistency and discriminant validity have been demonstrated, test-retest reliability and construct validity (correlations with standardised self-report and other observational measures) have yet to be established. Measures of volume, tempo and turn taking may be used to develop chain analyses of parents’ and adolescents’ representations of their nonverbal conflict on musical instruments. These may provide detailed information about intra- and interpersonal sequences that may drive and maintain heightened levels of conflict. These measures should be further tested, and other music therapy assessment measures may also inform chain analyses (e.g., APCI’s mutual attunement, NVC and parent’s emotional response scores may be adapted by being assessed at frequent time points during parent-adolescent nonverbal conflict interaction).

Additions or alterations to TRM may be made and evaluated in order to test possible explanations for outcomes proposed in this thesis. For example, does combining TRM with parents attending the Tuning in to Teens parenting program (Havighurst et al., 2012) or extending the number of sessions to focus on acquisition of verbal emotion coaching skills improve parents’ emotion coaching during parent-adolescent conflict interaction and consequently adolescents’ mental health? Or, does adding additional strategies that directly target processes identified in chain analyses of nonverbal conflict interaction improve parents’ ability to apply emotion coaching skills during parent-adolescent conflict and/or improve adolescent mental health?
7.10 Conclusion

Parent-adolescent conflictual relationships where parents have a history of trauma can be very difficult to work with in clinical practice. Clinicians and services are often unable to effectively help these families. Dyads may disengage, or escalate, often experiencing further distress in the process. Finding ways to help dyads break cycles of conflictual interaction is not just a matter of asking them to stop, reflect and think differently, or requiring that parents learn better parenting skills. Such methods (‘top down’) often fail. Accessing conflict dynamics by integrating ‘bottom up’ with ‘top down’ approaches as outlined in this thesis, combined with working systemically (as suggested from the revised version of the theoretical model proposed here) may offer an important advance in understanding what is helpful. This thesis has tested a new avenue for intervention and has critically appraised the method using a multi-faceted approach to evaluation. Changes on observational measures indicate that this thesis may contribute to the broader literature on how best to measure parent-child dynamics where parents have a trauma history. Music or other methods that directly work with nonverbal communication offer great promise for effectively assessing and intervening with this clinical group and should be further examined. TRM is one possible intervention that may be efficacious, though it requires further evaluation. TRM provides some important clues about what factors may be beneficial, and these warrant further investigation both in assessment and intervention development and evaluation.
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Appendix A: Ethics Approval

09 September 2015

Dr Sophie Havighurst
Mindful Centre for Training and Research in Developmental Health
The University of Melbourne

Dear Dr Havighurst,

I am pleased to advise that the Health Sciences Human Ethics Sub-Committee approved the following Project:

**Project title:** Tuning Relationships with Music: A Pilot Study

**Researchers:** Dr S S Havighurst, V Colegrove

**Ethics ID:** 1545067.1

The Project has been approved for the period: **09-Sep-2015 to 31-Dec-2015**

It is your responsibility to ensure that all people associated with the Project are made aware of what has actually been approved.

Research projects are normally approved to 31 December of the year of approval. Projects may be renewed yearly for up to a total of five years upon receipt of a satisfactory annual report. If a project is to continue beyond five years a new application will normally need to be submitted.

Please note that the following conditions apply to your approval. Failure to abide by these conditions may result in suspension or discontinuation of approval and/or disciplinary action.

(a) **Limit of Approval:** Approval is limited strictly to the research as submitted in your Project application.

(b) **Variation to Project:** Any subsequent variations or modifications you might wish to make to the Project must be notified formally to the Human Ethics Sub-Committee for further consideration and approval. If the Sub-Committee considers that the proposed changes are significant, you may be required to submit a new application for approval of the revised Project.

(c) **Incidents or adverse effects:** Researchers must report immediately to the Sub-Committee anything which might affect the ethical acceptance of the protocol including adverse effects on participants or unforeseen events that might affect continued ethical acceptability of the Project. Failure to do so may result in suspension or cancellation of approval.

(d) **Monitoring:** All projects are subject to monitoring at any time by the Human Research Ethics Committee.

(e) **Annual Report:** Please be aware that the Human Research Ethics Committee requires that researchers submit an annual report on each of their projects at the end of the year, or at the conclusion of a project if it continues for less than this time. Failure to submit an annual report will mean that ethics approval will lapse.

(f) **Auditing:** All projects may be subject to audit by members of the Sub-Committee.

If you have any queries on these matters, or require additional information, please contact me using the details below.

Please quote the ethics registration number and the title of the Project in any future correspondence.

On behalf of the Sub-Committee I wish you well in your research.

Yours sincerely,

Ms Hilary Young
Secretary
Health Sciences HESC
Phone: 03 8344 8595, Email: hilary.young@unimelb.edu.au

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Appendix B: Information Letters and Participant Consent/Assent Form

Parent Information Letter

TUNING RELATIONSHIPS WITH MUSIC™: A PILOT STUDY

Information Letter and Consent Form

Dear Parent/Guardian

Thank you for showing an interest in Tuning Relationships with Music™. This letter gives you more information about Tuning Relationships with Music™, and the research behind it.

Previous research has found that relationships with parents are very important for adolescents’ emotional, social and physical development, and for their wellbeing. Parenting can influence adolescents’ emotional intelligence. Emotional intelligence is the ability to understand and manage your emotions, as well as being able to communicate to others about how you feel. This includes what we communicate nonverbally as well as with words.

What will you learn in Tuning Relationships with Music™?

Tuning Relationships with Music™ is a form of family counselling developed by Vivienne Colegrove where you and your teen are assisted to improve your relationship, using music as a way of working on the nonverbal parts of your communication as well as the words you use. You will do this by listening to and playing musical instruments. No musical training or ability is needed to participate. You will also be given information about ways of responding to emotions with your teen that have been found helpful by other parents of teenagers. Counselling will be provided by the student researcher, who is a qualified and experienced family therapist, relationship counsellor and music therapist. It is hoped that you will learn how to change negative patterns of relating that cause conflict, and that you will learn new skills for working through problems and getting on together. Counselling will take place over 8 separate sessions. A time will be worked out with you to suit you and your teen. One and a half sessions will be with you on your own, one and a half with your teen on their own, and five sessions will be with the two of you together. All information you both give will be strictly confidential, unless there are concerns for your or your teen’s safety.

Participation in this study and counselling is free, but we ask that you and your adolescent complete a number of questionnaires and a short videotaped session where you play musical instruments together when you come to your first appointment, and again in 4 months time to help us evaluate whether counselling was helpful to you. This research has been given approval by the University of Melbourne Human Ethics Committee.

What do you need to do if you want to attend Tuning Relationships with Music™?

If you and your teen would like to take part in Tuning Relationships with Music™, please complete the consent form, ask your teen to complete their assent form, and bring them both to your first appointment.

What happens next?

At your first appointment, both of you will be given some questionnaires to fill out. If you or your teen needs assistance to do this, this will be available. You will be asked to complete some of the questions at home. These can be completed online, or filled out on a paper questionnaire and sent back using the self-addressed envelope provided. They will take approximately 30-40 minutes to complete. At your appointment, you and your teen will also be asked to play musical instruments together while being videotaped. This is to give us
information about how you communicate nonverbally, and will be used to find out whether *Tuning Relationships with Music™* might change your communication. You will also be given time separately and together to give some information about the problems you are having in your relationship, and about your experiences and strengths. The first appointment will take approximately 2 hours, or can be completed in two shorter sessions.

The research study design then requires that half of the participating families be assigned to an *immediate start*, and the other half to a *delayed start*. If assigned to the *immediate start* condition, you and your teen will start eight one-hour family counselling sessions straight away; if assigned to the *delayed start* condition, you will receive counselling in four months time. Regardless of which condition you are in, four months after you have completed the first questionnaires and videotaped music playing, we will ask you to complete the same questionnaires and videotaped music playing again. This will be to find out what has changed for you and your teen over that time. **You and your adolescent will then receive a JB-HIFI gift card to reimburse you for your time.** If you were assigned to the *delayed start* condition, you will then be offered *Tuning Relationships with Music™*.

**What happens with the information you give us?**

All information in your questionnaires, your videorecorded sessions, and counselling sessions will be strictly confidential and stored securely. This information can only be released under legal application, or if there are concerns about the safety of an adolescent or parent. Only a code number will be used to identify individual data. This data will be kept for five years after the study finishes before being destroyed. Neither you nor your adolescent will be able to access information provided in the other’s questionnaires or individual counselling sessions. You will be free to withdraw from the research or counselling at any time, and you may withdraw any unprocessed data previously supplied. Withdrawal from the research will not affect your entitlement to support available to you through the professional who referred you to the study in any way.

If there are things in the questionnaires, videotaped music making, or counselling sessions that you find difficult, the Student Researcher or Principal Investigator will be available for you to talk to. If during the research either you or your adolescent are experiencing serious difficulties, one of the researchers will discuss with you appropriate services available, and assist in a referral.

Findings from this study will be presented in professional settings (conferences and journal publications) but will only use de-identified results – so no personal details or information that might identify you or your teen in any way will be used. However, as only a small number of families will be included in the study, it is not possible to completely ensure that your identity will be protected. Only where you have specifically given consent, professionals learning how to use *Tuning Relationships with Music™* will see video of you and your teen playing music together. On completion of the study, a report of the results will be available to you.

**Declaration of potential conflict of interest.**

Ms Colegrove is the author of *Tuning Relationships with Music™*. As such she may benefit from positive reports of outcome of this study.

**Procedure for complaints and help.**

If you have any questions relating to this study, entitled ‘*Tuning Relationships with Music™: A Pilot Study*’, you can contact the Student Researcher, Vivienne Colegrove on 9371 0218, or the Principal Investigator, Dr Sophie Havighurst on 9371 0200. If you have any additional
concerns about the conduct of this research, you can contact the Executive Officer, Human Research Ethics, The University of Melbourne, ph: 8344 2073, fax 9347 6739.

Thank you for your interest.

Yours Sincerely

Vivienne Colegrove
PhD Candidate: Student Researcher
Mindful-Centre for Training and Research in Developmental Health
The University of Melbourne
Ph: (03) 9371 0218
vcolegrove@student.unimelb.edu.au

Dr Sophie Havighurst
Principal Investigator
Mindful-Centre for Training and Research in Developmental Health
The University of Melbourne
Ph: (03) 9371 0200
Dear Teen

We would like to invite you and one of your parents to take part in our research project. The research will find out whether Tuning Relationships with Music™, a counselling program developed by Vivienne Colegrove, may help you and your parent with your relationship.

Being part of the research would mean that you and your parent would fill out some questionnaires, and play musical instruments together while you are videotaped. This would happen two times over four months. It would also mean that you and your parent would be able to take part in free counselling that aims to use music to help you and your parent improve how you get along together. Some parents and teens will have counselling as soon as they have completed the questionnaires, music playing and a ‘getting to know you’ meeting. Other parents and teens will wait for 4 months after doing these, then they will complete the questionnaires and music playing again, before they have counselling.

Counselling will mean that Vivienne Colegrove, the counsellor who will work with you, will first meet with you and your parent to get to know you, and to find out what you both think could be better for how you get along. After that, you would come on your own to one and a half sessions, and with your parent to five sessions. Your parent will also come to one and a half sessions on her/his own. In counselling sessions you will get information about emotions and relationships. You and your parent will play drums first with the counsellor, and then with each other, to learn how to stop ways of relating that make you feel upset, and to then learn different ways of listening and responding to each other’s feelings. When you have finished counselling, the second questionnaires and videotaped music playing, we will give you a $30 JB HIFI gift card to thank you for your time.

The questionnaires and music playing are the same each time. All the questions will take about 30 minutes to complete each time. The videotaped music playing will take about 15 minutes each time. The ‘getting to know you’ and counselling meetings will each take about one hour, so you would have about eight hours with the counsellor altogether.

In the questionnaires there will be questions about how your parent responds when you feel sad, angry or fearful. There are also questions about your health and how you and your parent get along together. The videotaped music playing is so we can find out how you and your parent let each other know how you are feeling without using words. The questionnaires and your individual counselling meetings are confidential. This means that your parent will not see your answers, or know what you have said in your separate counselling meetings. However if there are worries about you or your parent’s safety, we may need to let someone know.

Taking part in Tuning Relationships with Music™ will help us learn more about whether this type of counselling is helpful for parents and adolescents. Information from your questionnaires, music playing and counselling will be used to let us know whether anything has changed for you and your parent. The information you give us will be kept private, and
not identify who you are in any way unless you specially give your permission. If your answers suggest you are having serious difficulties we will speak with you to see if there might be something that could help. You are free to decide if you wish to participate and can decide to stop at any time. Just tell your parents or contact us on the phone number below if you don’t want to keep going with counselling.

If any of the questions, music playing or counselling upset you or if you would like to talk to someone further you can call Vivienne Colegrove, the Student Researcher on 9371-0218 or Dr Sophie Havighurst on 9371-0202 or contact Kids Help Line on 1800 551 800 for advice.

Thank you very much for your time. Your participation in this project is greatly appreciated.

Yours sincerely

Ms Vivienne Colegrove
PhD Candidate and Student Researcher
Mindful-Centre for Training and Research in Developmental Health
The University of Melbourne
E: vcolegrove@student.unimelb.edu.au
P: (03) 9371 0218

Dr Sophie Havighurst
Principal Investigator
Mindful-Centre for Training and Research in Developmental Health
The University of Melbourne
P: (03) 9371 0202
Parent Consent and Adolescent Assent Form

**Parent Consent Form.**

**Project Title:** Tuning Relationships with Music™: A Pilot Study.
**Names of Investigators:** Dr Sophie Havighurst, Ms Vivienne Colegrove.

**Parent/Guardian Consent.**

1. I consent to the participation of my adolescent and myself in the above research project, the details of which have been explained to me.
2. I authorise the investigators to use with me the procedures explained to me.
3. I consent to the request for information about my adolescent in the form of a questionnaire and videotaped sessions to be completed by myself and by my adolescent, before and after family counselling, and understand that any information that my adolescent and I give to the investigators will remain confidential.
4. I understand that although every effort will be made to keep our identities protected, this may not be possible, due to the small number of families participating in this research project.
5. I acknowledge that:
   * I have read the written information about the project and have received a copy.
   * The possible effects of the assessment and family counselling have been explained to me to my satisfaction.
   * I have been informed that I am free to withdraw from the project at any time and to withdraw any unprocessed data previously supplied.
   * The project is for the purposes of research.
   * Information that is collected by the investigators will be recorded on electronic and paper questionnaires and on digital videotape, and will be securely stored either in password-protected electronic files or in locked filing cabinets at the University of Melbourne.
   * Once I have signed and returned this form, it will be retained by the researchers.
   * I have been informed that the information I provide will be safeguarded subject to any legal requirements.
   * I have been informed about the student researcher’s potential conflict of interest.

Name of Parent: ________________________ Name of Adolescent: _______________________

Parent’s Signature: _________________________ Date: __/__/__

Principal Research Investigator’s Signature: _________________________ Date: __/__/__

I authorise the investigators to ask our permission after our participation in the study to use our videotaped music playing for the purpose of professional education and training, understanding my adolescent and I can give or withhold consent at that time.

Yes/No (please circle one).
**Adolescent Assent.**

1. The details of this project have been explained to me and I understand them.
2. I agree to participate in this project.
3. I understand and agree to the request for information about me in the form of a questionnaire and videotape, to be completed by myself and by my parent/guardian, before and after family counselling.
4. I understand that any information that my parent/guardian and I give to the investigators will remain confidential.
5. I understand that although every effort will be made to keep my identity private, this may not be possible because of the small number of families taking part.
6. I agree to take part in the project, understanding that I can withdraw at any time without having to give a reason for my decision.

Name of Adolescent: ____________________________________________

Adolescent’s Signature ___________________________ Date: __/__/__

Principal Research Investigator’s Signature: _____________________ Date: __/__/__

I agree to be asked about using our videotaped music playing for professional training and education after we have finished taking part in this study, and understand that I can say yes or no at that time.

Yes/No (please circle one).
Appendix C: Measures

Screening Measures

Betrayal Trauma Survey (BTTS).

The BTTS is available online at http://dynamic.uoregon.edu/jjf/bbts/survey.gif. Scoring information, including of the High Betrayal under 18 years Subscale used in Study 3, is available at http://dynamic.uoregon.edu/jjf/bbts/categories.html.

Childhood Trauma Questionnaire (CTQ).

The CTQ is subject to copyright restrictions, and therefore is not reproduced here. Further information about obtaining the CTQ may be found at https://www.pearsonclinical.com.au.

Outcome Measures

Conflict Behaviour Questionnaire (CBQ).

The CBQ, including scoring information is available online at https://portal.ct.gov/-/media/dcf/ParentingSupportServices/PDF/ConflictBehaviourQuestionnaireParentpdf.pdf?la=en.

Emotions as a Child Questionnaire (EAC).

The EAC is subject to copyright restrictions, and is therefore not reproduced here. Further information about obtaining the EAC may be directed to the author, Dr Colleen O’Neal, onealc01@umd.edu.

Strengths and Difficulties Questionnaire (SDQ).

The SDQ and scoring information are free to download from http://www.sdqinfo.com/a0.html
Clinician-observed Measures

Assessment of Parent-Child Interaction (APCI).

The APCI is subject to copyright restrictions, and therefore is not described in further detail. Information about training, accreditation and use of the tool can be obtained from Associate Professor Stine Jacobsen at www.apci.dk.

Assessment of Responsiveness, Reactivity and Turn Taking (ARRT), and Assessment of Volume and Tempo (AVT).

A detailed description follows of the ARRT, and the AVT, developed by the author to assess dyads’ representation on musical instruments of their nonverbal conflict interaction, which are analysed in studies 2 and 3. Definitions, scale items, coding forms and coding worksheets are provided.
**Assessment of Responsiveness, Reactivity and Turn Taking.**

*Responsiveness scale and scoring.*

*Non-responsive behaviour.*

- Prolonged silences/pauses
- Playing as loudly or more loudly than the child for more than a brief period
- Playing as quickly or more quickly than the child for more than a brief period
- Playing rhythmic patterns that are unlike the child’s for more than a brief period
- Playing dynamic shapes that are unlike the child’s for more than a brief period

*Responsive behaviour.*

- Matching child’s quiet - moderate volume
- Matching child’s slow - medium tempo
- Briefly matching or mirroring child’s loud volume before playing more quietly
- Briefly matching or mirroring child’s fast tempo before playing more slowly
- Matching or mirroring part or all of the child’s slow-medium rhythmic patterns
- Matching or mirroring part or all of the child’s quiet – moderate dynamic shapes (e.g., sequence of getting louder/softer) (following the child)

*Description of scale.*

0. Very non-responsive: Non-responsive behaviour always present, no responsive behaviour
1. Non-responsive: Non-responsive behaviour mostly present, little responsive behaviour
2. Somewhat non-responsive: More non-responsive than responsive behaviour present
3. Non-responsive and responsive: Non-responsive and responsive behaviour equally present
4. Somewhat responsive: More responsive than non-responsive behaviour present
5. Responsive: Responsive behaviour mostly present, little non-responsive behaviour
6. Very responsive: Responsive behaviour always present, no non-responsive behaviour
Reactivity scale and scoring.

Reactive behaviour.

- Interrupting child’s playing
- Playing as loudly or more loudly than child consequent to child playing loudly
- Playing as quickly or more quickly than child consequent to child playing quickly
- Initiating loud volume consequent to child’s silence/pause or quiet playing
- Initiating quick tempo consequent to child’s silence/pause or slow tempo
- Where child and parent alternate (take turns) parent plays for longer than child

Non-reactive behaviour.

- Use of turn taking
- Use of brief pauses/silence
- Playing quietly consequent to child playing loudly
- Playing slowly consequent to child playing quickly
- Playing quietly consequent to child’s silence/pause or quiet playing
- Playing slowly consequent to child’s silence/pause or slow tempo

Description of scale.

0. Very reactive: Reactive behaviours always present, no non-reactive behaviour
1. Reactive: Reactive behaviours mostly present, little non-reactive behaviour
2. Somewhat reactive: More reactive behaviours than non-reactive present
3. Both reactive and non-reactive: Equal presence of reactive and non-reactive behaviour
4. Somewhat non-reactive: More non-reactive than reactive behaviours present
5. Non-reactive: Non-reactive behaviours mostly present, little reactive behaviour
6. Very non-reactive: Non-reactive behaviours always present, no reactive behaviour
**Turn Taking scale.**

*No turn taking.* Both parent and child play simultaneously. There is no evident intention or effort to take turns.

*Interrupted turn taking.* First either the parent or child plays, then the other plays. While one is playing, the other plays for part of the time. However, there is an evident intention or effort from the person interrupting (this may be either the parent or the child) to take turns. Accidental interruptions ARE included (i.e., possible reasons for the interruption such as an accidental movement that causes the instrument to make a sound, or confusion about when the other has finished are not analysed).

*Uninterrupted turn taking.* First either the parent or child plays, then the other plays. At no time does one play at the same time as the other.

**Description of scale.**

0. No turn taking occurs 100% of the time.
1. No turn taking occurs more than 50% of the time; interrupted turn taking occurs less than 50% of the time. No uninterrupted turn taking occurs.
2. No turn taking occurs less than 50% of the time; interrupted turn taking occurs more than 50% of the time. No uninterrupted turn taking occurs.
3. No turn taking, interrupted turn-taking and uninterrupted turn taking all occur.
4. Uninterrupted turn taking occurs less than 50% of the time; uninterrupted turn taking occurs more than 50% of the time. No turn taking occurs 0% of the time.
5. Uninterrupted turn taking occurs more than 50% of the time; interrupted turn taking occurs less than 50% of the time. No turn taking occurs 0% of the time.
6. Uninterrupted turn taking occurs 100% of the time. Interrupted turn taking and no turn taking occur 0% of the time.
Coding form.

Family _____________________  Date (Time 1 or Time 2) __________________
Coder ________________________

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Responsiveness/Reactivity scales.

0. Very non-responsive/reactive  4. Somewhat responsive/non-reactive
1. Non-responsive/reactive      5. Responsive/non-reactive
2. Somewhat non-responsive/reactive 6. Very responsive/non-reactive
3. Non-responsive/reactive and responsive/non-reactive equally present

Turn taking scale.

0. NT* 100%
1. NT more than 50%, remainder are IT**. No UT*** present
2. NT less than 50%, remainder are IT*. No UT* present
3. NT, IT and UT all present
4. UT less than 50%, remainder are IT. No NT present
5. UT more than 50%, remainder are IT. No NT present
6. UT 100%
   • NT No turn taking; ** IT Interrupted turn taking; *** UT Uninterrupted turn taking
Assessment of Volume and Tempo.

Time-interval coding. Where parent and child do not take turns (i.e., they are both playing at the same time throughout) put one entry for each in at 5-second intervals. Where parent and child take turns (i.e., they generally do not play at the same time as the other), create one entry for each turn, and note the duration of the turn in seconds.

Volume. Set volume level for computer playback to 50%. Code volume relative to the capacity of the instrument i.e., the quietest possible sound on a large drum will be louder than the quietest possible sound on a small shaker. Therefore a parent playing as quietly as they can on a shaker will be recorded at the same level as a child playing as quietly as they can on a large drum, even though the decibel level of the child’s playing may be much greater. Volume may also be affected by the strength of the person playing – i.e., a large teenage boy may be able to play louder on a drum than a small woman playing the same instrument. Therefore, a parent playing to the full extent of their strength on an instrument should be recorded at the same level as a child playing to the full extent of their strength on a different instrument, even if the decibel levels are quite different. At the other extreme, children who have difficulty with fine motor control may be playing as quietly as this allows them to play within the limits of their ability, and this should be recorded at the same level as a parent playing as quietly as they can within the limits of their capacity to do so, even though the actual decibel levels may very considerably.

Where volume varies during a 5-second interval, or during a turn, code the volume that is used for the longest amount of time within the interval/turn. For example, if the playing is mainly quiet, with one or two louder notes, code only as ‘quiet’ (i.e., do not code average or median volume).
Volume scale.

0. Not playing at all

1. Playing as quietly as possible on the instrument chosen, and within the player’s capacity for motor control and muscle strength (pianissimo)

2. Playing quietly within the range of the instrument chosen, the player’s capacity for motor control and muscle strength (piano)

3. Playing quite quietly within the range of instrument chosen, the player’s capacity for motor control and muscle strength (mezzo-piano)

4. Playing quite loudly within the range of instrument chosen, the player’s capacity for motor control and muscle strength (mezzo-forte)

5. Playing loudly within the range of instrument chosen, and within the player’s capacity for motor control and muscle strength (forte)

6. Playing as loudly as possible within the range of instrument chosen, and within the player’s capacity for motor control and muscle strength (fortissimo).
**Tempo.** As with volume, record tempo relative to how fast it is possible to play on an instrument (i.e., it is much harder to play slowly on a shaker than when beating a drum), and to motor control. Therefore a parent playing as slowly as they can on a shaker will be recorded at the same level as a child playing as slowly as they can when beating a drum, even though the tempo of the child’s playing may be slower.

Tempo may also be affected by the strength of the person playing – i.e., a large teenage boy may be able to play more quickly on a drum while still making a sound as loud as they wish than a small woman playing the same instrument. Therefore, a parent playing to the full extent of their strength on an instrument should be recorded at the same level as a child playing to the full extent of their strength on a different instrument, even if the tempi are quite different. At the other extreme, children who have difficulty with fine motor control may be playing as quickly as this allows them to play within the limits of their ability, and this should be recorded at the same level as a parent playing as quickly as they can within the limits of their capacity to do so, even though the actual tempi may vary considerably.

Where tempo varies during a 5-second interval, or during a turn, code the tempo that is used for the longest amount of time within the interval/turn. For example, if the playing is mainly quick, with a small number of slower notes, code only as 5 or 6 (i.e., do not code average or median tempo).
Tempo scale.

0. Not playing at all

1. Playing as slowly as possible on the instrument chosen, and within the player’s capacity for motor control and muscle strength (larghissimo - largo)

2. Playing slowly within what is possible on the instrument chosen, the player’s capacity for motor control and muscle strength (adagio)

3. Playing quite slowly within what is possible on the instrument chosen, the player’s capacity for motor control and muscle strength (andante)

4. Playing quite quickly within what is possible on the instrument chosen, the player’s capacity for motor control and muscle strength (moderato)

5. Playing quickly on the instrument chosen, and within the player’s capacity for motor control and muscle strength (allegro)

6. Playing as quickly as possible on the instrument chosen, and within the player’s capacity for motor control and muscle strength (presto-prestissimo).
Volume and tempo coding worksheet.

Family (code): __________  Time point (T1 or T2): _______________  Coder _________________________________

Average Scores (0-6): Volume ________________  Tempo ________________

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Exercise A: Length _____  Turns No/Yes: number ______  Interruptions (mark with *) ______  % Interrupted turns ______  % No Turns ______

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Exercise C: Length______ Turns No/Yes: number______ Interruptions (mark with *)_______% Interrupted turns_______% No Turns_______%

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Author/s:
Colegrove, Vivienne Mary

Title:
Examining the efficacy of Tuning Relationships with Music™ in helping parents with a history of interpersonal trauma reduce conflict and improve emotional responsiveness with their adolescent

Date:
2018

Persistent Link:
http://hdl.handle.net/11343/217994

File Description:
Thesis

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