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THE RELATIONSHIP BETWEEN VOCAL COORDINATION AND
THERAPEUTIC ALLIANCE IN MENTALIZATION-BASED TREATMENT
FOR CHILDREN (MBT-C)

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The Relationship Between Vocal Coordination and Therapeutic Alliance in
Mentalization-Based Treatment for Children (MBT-C)

Çocuklar için Zihinselleştirmeye Dayalı Terapide (MBT-C) Vokal Koordinasyon
ve Terapötik İttifak Arasındaki İlişki

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ABSTRACT

Therapeutic alliance refers to the collaborative and emotional bond between therapist and client. Vocal coordination involves therapists aligning their vocalizations with the child's expressions. The association between vocal coordination and therapeutic alliance has not been previously studied in the context of child psychotherapy. The aim of the current study is to investigate the relationship between therapist's vocal coordination and therapeutic alliance in Mentalization-Based Treatment for Children (MBT-C) and explore the relationship between pitch characteristics, pitch synchrony and therapeutic alliance in selected 4 sessions with low and high alliance. The study hypothesizes that nonverbal vocal coordination positively predicts therapeutic alliance and that child and therapist vocal pitches correlate in selected sessions. Also, the pitch content was descriptively analyzed in selected sessions. Participants included 101 children who received MBT-C at Istanbul Bilgi University Psychological Counselling Center as part of a Randomized Controlled Trial. The Therapy Process Observational Coding System - Alliance scale (TPOCS-A) measured therapeutic alliance, while the Psychotherapist's Nonverbal Coordination Coding System assessed vocal coordination. Multilevel modeling was used for the main analyses, and PRAAT software was employed for pitch content and pitch synchrony analysis. The results showed that therapists' vocal coordination scores positively predicted therapeutic alliance scores. The results of the pitch synchrony analysis showed that the dyads tended to have higher pitch synchrony in low alliance sessions. The exploratory analysis of pitch characteristics showed that the children in low alliance sessions had higher pitch standard deviation and mean pitch. The children in low alliance sessions could have exhibited more emotional intensity changes and expressed higher intensity of emotions. Lastly, the children in low alliance settings might be in need for greater empathic attunement and vocal synchrony.

Keywords: Nonverbal communication, Vocal coordination, Therapeutic alliance, Pitch synchrony, Mentalization

ÖZET

Terapötik ittifak, terapist ve danışan arasındaki işbirlikçi ve duygusal bağı ifade eder. Vokal koordinasyon, terapistin vokal kullanımını çocuğun ifadeleriyle uyumlu hale getirmesini içerir. Vokal koordinasyon ve terapötik ittifak ilişkisi çocuk psikoterapisinde daha önce çalışılmamıştır. Bu çalışmanın amacı, Çocuklar için Zihinselleştirmeye Dayalı Terapide (MBT-C) terapistin ses koordinasyonu ile terapötik ittifak ilişkisini araştırmak ve seçilen dört seansta ses perdesi özellikleri, senkronizasyonu ve terapötik ittifak ilişkisi incelenmiştir. Sözel olmayan vokal koordinasyonun terapötik ittifakı olumlu yordayacağı ve seçilen seanslarda çocuk ve terapistin ses perdeleri arasında senkroni bulunacağı hipotezleri öne sürülmüştür. Ayrıca, seçilen seanslarda ses perdesi içeriğinin tanımlayıcı özellikleri araştırılmıştır. Katılımcılar, İstanbul Bilgi Üniversitesi Psikolojik Danışmanlık Merkezi'nde Randomize Kontrollü Araştırma kapsamında MBT-C tedavisi alan 5-12 yaş arasındaki 101 çocuktur. Terapötik ittifak puanları için Therapy Process Observational Coding System - Alliance Scale (TPOCS-A) ve vokal koordinasyon kodlaması için Psychotherapist's Nonverbal Coordination Coding System kullanılmıştır. Ana analizler için çok düzeyli modelleme, perde içeriği ve perde senkronizasyonu analizleri için PRAAT yazılımı kullanılmıştır. Sonuçlar, terapistlerin vokal koordinasyon puanlarının terapötik ittifak puanlarını pozitif yönde yordadığını göstermiştir. Ses perdesi senkronu analizinin sonuçları, ikililerin düşük ittifak seanslarında daha yüksek ses perdesi senkronuna sahip olma eğiliminde olduğunu göstermiştir. Perde özelliklerinin keşfedici analizi, düşük ittifak seanslarındaki çocukların daha yüksek ses perdesi standart sapmasına ve ortalama ses perdesine sahip olduğunu göstermiştir. Düşük ittifak seanslarındaki çocuklar daha fazla duygusal yoğunluk değişimi sergilemiş ve daha yüksek yoğunlukta duygular ifade etmiş olabilirler. Son olarak, düşük ittifak seanslarındaki çocuklar daha fazla empatik uyum ve vokal senkronizasyona ihtiyaç duyabilirler.

Anahtar Kelimeler: Söz dışı iletişim, Vokal koordinasyon, Terapötik ittifak, Ses perdesi senkronisi, Zihinselleştirme

INTRODUCTION

In child and adolescent psychotherapy process research, the quality of therapeutic relationship is founded to be one of the main precursors of improved therapeutic outcome (Orlinsky et al., 2004; Karver et al., 2018). Even if it is hard to define what makes a therapeutic relationship good, therapeutic alliance or working alliance can be a term to be used as one of the defining components of positive therapeutic relationship. In the context of psychotherapy, the term therapeutic alliance corresponds to creating a social bond and a feeling of working together on the therapeutic work (Green, 2006). To build and establish therapeutic alliance in a psychotherapeutic relationship, previous researchers mostly agreed that nonverbal behavior of the therapist can be one of the decisive components of the techniques (Philippot et al., 2003). Although the nonverbal aspect of the interaction between therapist and child is an important part of the process for building therapeutic alliance, literature on nonverbal communication is still newly flourishing and restricted.

One of the key components of nonverbal coordination is synchrony between therapist and client. Synchrony is a term used in many different domains to indicate the temporal link between occurrences, as Feldman (2007) suggests, it can be applied to study interpersonal relationships and mother-infant interaction. As the synchrony takes part in creating social bonds with the primary caregiver, it shapes emotional development of the infant and thus has an effect on developing attachment bonds and emotion regulation capacities (Feldman, 2007). One of the areas of studying synchrony in mother-infant interaction is studying mother-infant face to face communication, which shows that moment-to-moment facial communication is crucial in the development of self and object representations of the infant (Beebe et al., 1997). Being in parallel with facial communication, another significant area of communicating in the early months development is using nonverbal vocal communication (Tronick, 1989). Therefore, nonverbal vocal

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coordination plays a significant role in both creating social bonds and the development of attachment and emotion regulation (Schachner et al., 2005).

The aim of this study is to investigate the relationship between therapist's nonverbal vocal coordination and therapeutic alliance in Mentalization-Based Treatment for Children (MBT-C). MBT-C is a therapeutic approach that aims to help children understanding self and other's mental states. This approach is designed to improve children's capacity for mentalization, which is to interpret and reflect on feelings, thoughts and desires that influence behavior. This therapeutic approach enhances children's mentalization capacity by using body movement and vocalization, alongside verbalization, to reflect their inner states and build the therapeutic relationship. Therefore, it is important to study the relationship between vocal coordination and therapeutic alliance in MBT-C. To assess vocal coordination and synchrony, both observer-rated data of vocal coordination of the therapist and acoustic measurements of pitch synchrony between therapist and child will be analyzed in terms of their relationship between therapeutic alliance. On the other hand, observer-rated data of the Therapy Process Observational Coding System for Child Psychotherapy – Alliance scale (TPOCS-A; McLeod, 2005) will be used for gathering data of therapeutic alliance. While there are limited but several studies on vocal pitch synchrony in adult psychotherapy setting, their findings are contradictory. In the study by Reich et al. (2014), vocal pitch synchrony was found to be negatively correlated with therapeutic alliance. In a contrast, study by Imel et al. (2014) found that there was positive relationship between vocal pitch synchrony and therapist empathy scores, which signals an association for therapeutic alliance. In addition to the limited studies in the literature, there are no studies focused on vocal pitch synchrony in the field of child psychotherapy to the best of our knowledge. Therefore, this study aims to fill the gap in the literature and gain more information about the impact of nonverbal elements on psychotherapeutic relationship.

CHAPTER 1
LITERATURE REVIEW

1.1. MENTALIZATION

1.1.1. Theory of Mentalization

Mentalization refers to the skill of interpreting and comprehending the mental and emotional states of oneself and others, which include thoughts, feelings, desires, and intentions. In other terms, mentalizing is the ability of understanding our and others' behavior and their underlying intentions and motives. It also covers the ability of understanding the impact of our own behaviors and affects on others. Mentalization is founded to be essential for developing skills of empathy, attention control and emotion regulation (Bateman & Fonagy, 2012). When we are effectively using our mentalizing abilities, we tend to be capable of recognizing our own and emotions, which allows us to perceive how others see us; have the ability to understand the feelings and motivations of others, and see their reactions and behaviors from this standpoint; recognize that there are limits of our ability to understand what is on other's minds; show an interest in understanding how the world appears from other people's viewpoints and how our own perspective may impact our actions or shape our perception of their behavior; and being aware that we might make mistakes on understanding others' behaviors and the effort of understanding these mistakes might improve our relationships (Midgley et al., 2017).

In the early development of mentalization, *contingent and congruent marked affect mirroring* of the parents plays a central role in both developing recognition of self and self-regulation (Midgley et al., 2017). Fonagy and Allison (2014) states that, in the interactions of parents and infants, parents mirror the infant's affect, but with less intensity; in a manner that accurately represents the infant's state of mind (*congruent*); in a timely way, after the infant shows emotion (*contingent*); and *mark* it, possibly through exaggerated facial expression or

vocalization to convey that they acknowledge the emotion, without feeling it in the same way. Moreover, these initial encounters contribute to the child forming a continuous expectation of empathetic reactions from others, forming *epistemic trust,* meaning, a readiness to perceive new information from another individual as reliable, applicable, and related to themselves (Fonagy & Allison, 2014).

As Winnicott (1967) states, infants see themselves in the loving gaze of the mother, who gently perceives and mirrors the subtle changes in their emotional states. By perceiving those mirroring moments from their parents, infants take feedback about how their emotional states feel like and use these experiences as their building blocks for development of mentalizing oneself (Midgley et al., 2017). As microanalysis studies of mother-infant interaction show that, infants are excellently sensitive about their parents' mirroring communication (Beebe et al., 2012). Stern (2010) referred to this as a dance between parent and infant, where the rhythm and feeling of relational bonding are established. Therefore, one of the mediators between early experiences with the caregiver and development of early mentalization is through the nonverbal attunement between child-caregiver dyad. As stated above, the infant's mentalizing capability evolves early in the attachment relationship, allowing the infant to regulate its emotions through the caregiver's ability to understand and emotionally mirror the infant. In this process, nonverbal synchrony, attunement and contingency play parts while forming the ability of mentalization in early childhood and infancy (Beebe & Lachmann, 2014).

As described by (Luyten et al., 2012), mentalization can be thought in terms of 4 different axis, which are *implicit* (automatic) versus *explicit* (controlled), *internal* versus *external* based, *cognitive* versus *affective,* and *self* versus *other* oriented. These categories can be described as: mentalization can be *implicit* where it is rapid, nonverbal and nonconscious, or can be *explicit* which is slow, verbal and reflective; and it might be *internal* which is focused on internal states by perspective taking or *external* which refers to taking nonverbal cues as basis such as facial gestures or tone of voice; it can be focused on one's own mental states (*self*) or focusing mental states of others (*other*); it can be *cognitive* refers to being focused

on inner motivations and beliefs, or *affective* refers to being focused on feelings (Luyten et al., 2012).

For the purpose of this study, the polarities of *implicit* versus *explicit* and *internal* versus *external* are particularly relevant to our research topic. Bodily actions, including facial expressions, gestures, vocal tone, head nods, eye contact, and inhalations, commonly reveal *implicit* mentalization during human interactions. In parallel with that, *external* mentalization is focused on the nonverbal cues including tone of voice. It is concluded that these bodily cues promote mutual understanding and alignment among people, along with nonverbal synchrony (Shai & Belsky, 2011).

1.1.2. Mentalization-Based Treatment for Children (MBT-C)

Mentalization-Based Treatment (MBT) was first developed to treat adults with Borderline Personality Disorder (BPD), which was reconceptualized by Fonagy and Bateman as "a disorder of mentalizing" (Midgley et al., 2017). Starting in the early 1990s, Bateman and Fonagy identified specific changes to psychodynamic therapy that emphasized the ability to mentalize. This led them to develop a new therapeutic model for adults with BPD called MBT (Bateman & Fonagy, 2004). Bateman and Fonagy (2004) took mentalization as a common factor across all psychotherapy methods and concluded that improving mentalizing is a crucial aspect of therapeutic effectiveness.

According to Fonagy et al. (2019), the enhancement of mentalization requires a secure therapeutic relationship that fosters "epistemic trust" where the therapist is mentalizing child's inner states. The development of mentalization has been linked to better emotion regulation, impulse control, and resilience, acting as a protective factor against psychopathology (Fonagy & Target, 2003). Impaired mentalization is found to be connected to externalizing and internalizing problems in children, as well as a broad spectrum of other psychological difficulties (Bizzi et al., 2022).

With insights from previous mentalization studies, Midgley and his colleagues formalized Mentalization-Based Treatment for Children (MBT-C) in

2017, as a short-term psychotherapy model for children between 5 and 12 years old. MBT-C seeks to foster mentalizing and resilience, restoring the developmental process for the child. By equipping both the family and child with enhanced coping mechanisms, it enables them to confront initial therapy concerns and utilize supportive relationships more effectively. MBT-C also aims to enhance the child's emotional regulation skills and support parents in meeting their children's emotional needs optimally. In this way, engaging parents in the therapy process alongside their child is regarded as essential, not only for immediate outcomes but also to have lasting parental support to facilitate the child's development even after the therapy concludes (Midgley et al., 2017). To better understand how MBT-C is applied, the therapist stance and therapeutic interventions will be discussed below.

Before going into the details of therapeutic techniques in MBT-C, the therapist stance should be mentioned as it lays the groundwork for all other interventions. As one of the main goals of MBT-C is improving the capacity of mentalizing, the therapist primarily embraces a *mentalizing stance*, characterized by a sincere curiosity about the child's inner world and a genuine presence in the relationship to empathize with the child's subjective experiences. Through attentive listening and maintaining awareness of the child's inner states, while utilizing empathetic interpretations and questions without judgment, the therapist can nurture the child's self-mentalizing in the presence of an other (Midgley et al., 2017). The therapeutic presence of the MBT-C therapist involves having basic helping orientation, authenticity, non-judgment, genuineness, acceptance, respect, responsiveness, presence, empathy, alongside a readiness for self-disclosure when it is appropriate. Lastly, mentalizing stance of the therapist in MBT-C also includes *not-knowing stance*, which states that the therapist is aware of the opaqueness of the mental states of others. In other words, it recommends that the therapist's hypotheses about the child's inner world should be viewed as mental constructs rather than absolute knowledge, and they should be collaboratively explored with the child and/or parents during therapy sessions (Bateman & Fonagy, 2006). Now, the therapeutic interventions of MBT-C will be discussed below.

In the techniques of MBT-C, there are three categories as attention control interventions, emotion regulation interventions and explicit mentalization interventions. These three categories are believed to build upon one another, implying that the development of a child's attention control skills is a prerequisite for effectively implementing emotion regulation interventions. Attention control interventions are aimed on regulating attention by mirroring/attunement and creating joint attention where the dyad creates the feeling of being together by creating rhythm and structure. Also, the therapist focuses on the bodily experiences of the child and regulating impulsivity by changing the speed of interactions during the session if needed. In this context, nonverbal cues like body language, facial expressions, vocal tone, eye contact, and gestures play a significant role in fostering joint attention, synchronization, and establishing a flow in interactions within attention control interventions in MBT-C (Midgley et al., 2017).

Since the interventions in MBT-C are structured in a sequential manner, a certain level of emotion regulation skills is necessary before engaging in explicit mentalization interventions. As the second category of MBT-C interventions, emotion regulation interventions include increasing awareness about the perception and feelings, validating emotions implicitly (with nonverbal features) and explicitly (verbal), naming feeling states and help the child to express feelings. During the session, certain children may experience heightened arousal and struggle with emotional regulation, leading to breakdowns in mentalization. Therefore, regulation of arousal is another crucial aspect of improving emotion regulation skills. For example, if the child is aroused too much while playing football, hitting the ball too hard that creates risk of damaging the items in the room, the therapist may mark the child's excitement verbally and implicitly, while making slow and long vocalizations. By that, the therapist's contingent coordination with the child such as via making a soothing tone of voice can be the therapeutic intervention that may help the children to regulate their emotions, as a step to go through explicit mentalizing interventions.

The final element of mentalization, known as explicit mentalization, comes into play only when the child reaches an ideal state of alertness, enabling him or her

reflect on own and others' mental states. Explicit mentalization interventions contain linking mental states to behavior of the child, changing perspectives to mentalize self and others and mentalizing the relationships inside and outside psychotherapy setting. As an illustration, the child might delve into the mental states of others by immersing themselves in the inner worlds of characters within a play, a process further enriched through role-playing and adopting the perspectives of these characters. Moreover, engaging in mentalization regarding the therapeutic relationship constitutes another type of explicit mentalization interventions, regarded as higher levels of mentalizing activity. This practice might be challenging as it involves reflecting on here and now, while it can be arousal provoking for both the child and therapist (Midgley et al., 2017).

1.2. VOCAL SYNCHRONY

1.2.1. Attunement and Parent-Infant Vocal Synchrony in Early Childhood Development

Nonverbal communication is a form of communication that is mostly overlooked in former decades of psychological studies, however, it turns out to be that it plays a significant role in dyadic interactions with the light of the recent interest of studies. It involves communication of thoughts or emotions without spoken words. Nonverbal communication includes wide range of nonverbal cues such as tone of voice, facial expressions, bodily gestures, posture and eye contact (Duncan, 1969). One aspect of nonverbal communication is synchrony, where the behavior of the dyad is aligned. Synchrony is a term used in various domains that signals the temporal correlation between events. In the context that Feldman (2007) suggests, it can be applied to study the dyadic interpersonal relationships and interactions between parents and infants.

Nonverbal synchrony in early childhood is one of the founding aspects of cognitive, emotional and social development of an infant. Research indicates that coordinated engagements between caregivers and infants play a role in emotional

growth, stress management, and the formation of secure attachment (Feldman, 2007; Tronick, 1989). Bowlby's Attachment Theory (1958) lay the groundwork for studies on nonverbal synchrony by providing a theoretical foundation for understanding the significance of early caregiver-infant interactions in the formation of attachment bonds. Attachment theory of Bowlby (1958) and Ainsworth (1978) suggests that mother-infant dyad establishes an attachment bond within the first year of infancy. Early interactions, rich in nonverbal experiences such as jointly created facial expressions, posture, tone of voice, and gestures, contribute to the development of a secure attachment relationship. Through these repeated interactions, infants form internal working models that shape their expectations about relationships (Bowlby, 1973). Emotionally attuned communication between the caregiver and infant establishes the primary caregiver as a secure base, fostering the child's sense of security and ability to explore (Bowlby, 1988).

Mother and infant dyads use various mediums of communication in their social play and some of them are vocal interactions and vocal synchrony for nonverbal communication (Stern, 1985). The synchrony between caregiver and infant is achieved through caregiver's attunement and sensitivity, which includes shared focus of attention, temporality and contingency. Especially in the neonate period, the attunement of the caregiver mother comes to the fore in the communication between the caregiver and newborn (Biringen, 1990).

Attunement in the early mother-infant dyad is the alignment of the caregiver to infant's emotional state and needs by reading subtle signals of the infant such as facial expressions and vocalizations, thus creating a harmonious interaction. Hence, attunement entails the capacity to sense and understand the internal state of others, adapting one's behavior accordingly (Stern et al., 1985). Given that these processes and responses occur in less than half a second, a duration insufficient for conscious behavior, the majority of responses involve an unconscious and inherent component (Papoušek & Papoušek, 1992). Attunement is not just a temporally aligned events happening in the same modality, such as smiling of the caregiver when the infant smiles -which can be classified as mimicry-, but more complex harmony of

interaction between various modalities. One example of this phenomenon is the synchronization of the intensity of infant's physical behavior with the mother's vocal expressions, manifested by the mother's voice becoming louder and more aroused as the infant engages in increased arm movements (Condon & Sander, 1974).

Another parameter which is one of the corner stones of attunement is contingency. Contingency is defined by the temporal and probabilistic association between events, indicating that the occurrence of one event raises the probability of another event happening. In relationship dynamics, prominently seen in parent-infant interactions, contingency involves the flexible and responsive engagement of one participant with the cues or behaviors of the other, establishing a dynamic and mutual connection. This underscores the interdependence of actions or responses, unfolding in a connected and significant manner (Feldstein et al., 1993). Tarabulsy et al.'s study highlights that infants express positive emotions in the presence of contingencies, contrasting with negative emotions when these contingencies are interrupted. The significance of contingency becomes evident in the developmental process of young infants, who organize their behavior and understand the social environment through the contingencies that occur in their surroundings (Tarabulsy et al., 1996).

For the nature of vocal synchrony in dyads, temporal coordination is more crucial than other characteristics of achieving vocal synchrony. The temporal coordination can be achieved by any of the following: vocal rhythm, vocal pitch or vocal intensity. The temporal coordination between mother and infant signals a reciprocal interaction and harmony rather than simple repetition or mimicry (Harrist & Waugh, 2002).

Studies show that the vocal synchrony and regulation between caregiver-infant relationship occurs as early as in the first two years of infancy. The study by Rutter and Durkin (1987) have shown that children between 18-24 months period start performing regulation of vocal coordination with their mothers. For instance, like adults, they start to punctuate their vocal endings during an interaction and use gaze for paying attention when the mother is talking.

Apart from vocal coordination regulation based on punctuation and gaze use, another type of vocal coordination is achieved through interpersonal vocal timing coordination. Four month old infants were found to use vocal coordination in terms of coordinated interpersonal timing of the vocalizations while interacting with their mothers. They were modifying their vocalization durations, pauses and simultaneous speech by reflecting to their mothers' use of vocalization (Feldstein et al., 1985). While vocal rhythm coordination is a phenomenon emerging in caregiver-infant vocal communication, it is also founded to be predicting attachment types of infants. Vocal rhythm coordination of 4 month olds were predicting infant attachment of 12 months as the highest level of rhythm coordination would predict most insecure attachment types of anxious-resistant and disorganized. On the other hand, lowest level of rhythm coordination was predicting avoidant attachment and midrange of rhythm coordination were predicted secure attachment. Therefore, high and low ends of the level of rhythm coordination were predicting insecure attachment (Beebe et al., 2000). Beebe's microanalytic works on the infant-mother interaction shed light upon the inner dynamics of forming "*presymbolic representation patterns*" in the early relationship, where the infant builds up expectations about the interactions in the environment (Beebe & Lachmann, 2002)

Apart from vocal rhythm, temporal coordination of vocal synchrony between caregiver and infant is measured by vocal pitch synchrony. Malloch et al. (1997) found that over the course of 5 minute vocal interaction analysis, mothers have a pattern of pitch movement in their use of vocalization and infants are tracking these movements with their own vocal pitches. Also, they have found significantly precise vocal pitch matches between mother-infant dyads where infants are tuning themselves to mother's pitch.

The nonverbal interactions observed in mother-infant dyads argues for a resemblance in interactions occurring in therapist-client interactions (Stern, 1974; Beebe & Lachmann, 1998; Beebe & Lachmann, 2002). Beebe & Lachmann introduces self and mutual regulation processes in both mother-infant dyads and therapeutic relationships. Self-regulation includes one's ability to manage their own

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emotions and behaviors with self-soothing and self-comforting practices whereas mutual regulation involves interactive processes between a dyad where they co-regulate their own and other's emotions respectively in a dynamic and moment-to-moment manner. This continuous exchange includes both verbal and nonverbal aspects in a therapeutic work (Beebe & Lachmann, 1998). Therefore, the literature on vocal synchrony in psychotherapy setting will be discussed.

1.2.2. Research on Vocal Pitch Synchrony in Psychotherapy

In the literature, vocal characteristics were mostly studied in terms of rhythm, pitch and intensity, which can be thought as the parameters which are found to be related to emotion expression and communication (Scherer, 2003; Juslin & Laukka, 2003; Schuller et al., 2011). In addition, these parameters of vocalization does not need subjective methods to assess as objective data can be gathered through computational methods, which makes them more suitable for research interests (Paz et al., 2021). Vocal pitch is measured by fundamental frequency of a sound signal -the lowest frequency of a periodic waveform- which is also abbreviated as "f0". Also, higher mean f0 is founded to be indicative of higher intensity encoded arousals, which means higher intensity of emotions (Juslin et al., 2005). Another important term for vocal pitch synchrony is speech turn, which means a part of the conversation that one speaker talks continuously without an interruption. A speech turn dyad consists of two consecutive speech turns in conversation involving different participants.

After initial application of speech-related research on psychotherapy research by Rice and Wagstaff (1967), the studies on vocal expression in psychotherapy context has gained interest in the recent decades (Tomicic et al., 2015). However, the research on vocal pitch synchrony in the field of psychotherapy research is still restricted and has contradictory findings. There are several studies on vocal pitch synchrony in psychotherapy and the findings of these studies will be mentioned.

In their pioneering study on vocal synchrony within a psychotherapeutic context, Imel et al. (2014) studied pitch synchrony during role-played therapy sessions, examining the correlation between therapist and patient pitch levels and its relationship with therapist empathy ratings. They analyzed 89 motivational interview sessions conducted with standardized patients (SPs), individuals trained to present psychological cases for educational purposes. Utilizing PRAAT, a phonetics analysis software (Boersma & Weenink, 2012), to measure pitch during minute-long conversations, they found significant pitch synchrony between patients and therapists. Moreover, sessions rated higher in empathy exhibited overall lower pitch levels, suggesting a link between lower pitch and higher empathy ratings. The study used manual segmentation for speaker identification and advanced speech signal processing methods for fundamental frequency (f_0) estimation. By examining mean f0 synchrony at both minute and session levels, the researchers discovered strong correlations ($r = .71$) between therapist and SP mean f_0 values, significantly higher than the correlation ($r = .08$) in randomly paired therapist-patient dyads. Furthermore, the correlation was stronger in sessions with high empathy ratings ($r = .80$) compared to those with low empathy ratings ($r = .36$), supporting their hypothesis about the relationship between therapist empathy and vocal synchrony.

Another study on vocal pitch synchrony in psychotherapy was conducted by Reich et al. (2014). They were hypothesized that pitch synchrony will be present in therapist-client dyads, therapists will be the ones who is leading the pitch shifts and clients will follow them, and greater pitch synchrony will be associated with perceived positivity and better therapy outcomes. They have used a data set of audio recordings from a counseling center of a university with 52 cases. They have selected the midpoint treatment sessions as 3rd sessions from 6 sessions long short term treatment processes. For measuring pitch synchrony, they first labeled the speech turns of therapist and client manually. Then, they have first created a therapist-leading pitch synchrony, where the mean pitch frequency of each therapist speech turn were correlated with client speech turn that comes afterward. Then, they have also created a therapist-following pitch synchrony score where the mean pitch value of each therapist speech turn were correlated with client speech turn comes

before. They have found a moderate correlation between therapist-leading and therapist-following pitch synchrony scores ($r = .42$). Therefore, they have also calculated an overall pitch synchrony score for each session with calculating the mean value of therapist-leading and therapist-following synchrony scores. As a result, they have found an overall synchrony between therapist and client ($M = 0.12$, $SD = 0.13$), which was notably lower than what Imel et al. (2014) have found. Secondly, they have found that therapists were more leading pitch shifts than clients, however the difference was not statistically significant. Finally, they have found that greater therapist-leading pitch synchrony was associated with lower client rated therapeutic alliance scores. Therapist-following pitch synchrony was also negatively associated with therapeutic alliance but it was not significant. These findings of negative association between pitch synchrony and therapeutic alliance were contradictory with findings of Imel et al. (2014), they discussed the results as there may be an attunement of the client to the therapist's voice when their relationship is in hardship -which makes clients more passive- or they may have responding to the rupture moments with engaging in more synchrony to repair the relationship.

Another recent study was done by Schoenherr et al. (2021) on the relationship between vocal synchrony and therapy outcome and attachment anxiety in social anxiety disorder treatment, where they were also controlling for therapeutic alliance and movement synchrony. They gathered data from 64 patients with social anxiety disorder and they used a similar method to Reich et al. (2014) for measuring vocal synchrony, where they have also calculated median and range of the fundamental frequency for each manually labeled speaker turns. They have differentiated therapist-led and patient-led synchrony, and they found that higher vocal synchrony led to negative outcome with higher symptom distress, attachment anxiety and interpersonal problems. They argued that higher vocal synchrony could arise from lack of autonomy in social anxiety disorder patients, which led them to follow therapist's pitch shifts or as attempts for repairing rupture.

In conclusion, there are studies investigating the relationship between vocal pitch synchrony, therapeutic alliance, therapist's empathy and outcome in adult

psychotherapy literature. However, the studies in this research topic is limited and have contradictory findings. Also, there is a gap in the research literature of the relationship between vocal pitch synchrony and therapeutic alliance in child psychotherapy context. Therefore, the current study aims to fill the gap in the literature by investigating this relationship while comparing low and high therapeutic alliance contexts.

1.3. THERAPEUTIC ALLIANCE IN CHILD PSYCHOTHERAPY

1.3.1. Psychoanalytic Background of Therapeutic Alliance

Theoretical background of therapeutic alliance in child psychotherapy were brought from adult literature. In the adult literature, the term alliance were originated by Freud (1912) in his works where he took the concept in terms of transference neurosis in psychoanalysis (Kanzer, 1981). He stated that the rapport and relationship between analyst and patient were important in the way that the patient project their unconscious fantasies, wishes and drives onto the analyst, so they would be worked through in the analytic process by bringing them into consciousness to cure neurosis. He saw alliance as a part of positive transference where he brings sublimated positive transference as a base for patient's cooperating alliance with the analyst. Also, he stated the importance of alliance on eliminating initial resistance in an analytical process (Freud, 1913).

The term *therapeutic alliance* was first used by Zetzel (1956), where she was using the term different than Freud as she was separating it from transference neurosis. She was suggesting a relationship between therapeutic alliance and early interactions between mother and infant, where the trust is a necessary part of the relationship. On the other hand, Greenson (1965) used the term *working alliance* to distinguish between transference and alliance and put an emphasis on the motivational part of the alliance, where it was symbolizing the patient's motivation to join in the analytical work with the analyst (Greenson, 1965). Taking Greenson's works one step further, Bordin (1979) also used the term *working alliance* and listed

its three components as: *bonds, tasks, and goals*. *Bonds* signal the reliable and strong relationship between therapist and client based on mutual trust; *Goals* explain the common treatment goals both therapist and client were agreed on; whereas *tasks* were putting emphasis on the equal amount of therapeutical works done by client and therapist (Bordin, 1979).

The concept of therapeutic alliance were brought into the literature of child psychoanalysis with the works of Anna Freud (1946), where she stated that child's *"affectionate attachment"* and good relationship between therapist and child are serving as a base for child analysis and interpretation (A. Freud, 1946). Anna Freud was separating the concept into two features as emotional bond and work task. Emotional bond was more related to the affective and relationship aspect of the alliance whereas work task was arguing for the child's collaborative stance and work through the analysis.

While contrasting with the perspective of A. Freud, child-centered orientations argued that the therapeutic alliance was functioning itself as a healing component in psychotherapeutic process. Axline (1947) argued that the therapeutic relationship itself serves as a trust base for the child to play and discover their inner world, conflicts and fantasies, which was resulting from the relationship's feature as creating an accepting, warm and sensitive environment with stable frames (Axline, 1947). Supporting the stance of Axline's, Carl Rogers (1957) also emphasized the importance of therapist's attitude as exhibiting unconditional positive regard and empathy towards the child, where he resembles it to "mother's love for her child".

Attachment theorists Bowlby (1958) and Ainsworth (1978) argued therapeutic relationship in the context of attachment theory. In the early childhood experiences, the infant develops a sense of trust and secure attachment style if the mother is available and sensitive to child's needs, therefore the infant uses the sense of trust to discover environment (Ainsworth, 1978). In the therapeutic relationship, early mother-infant interactions, attachment styles and internal working models are triggered especially in the face of insecurity and anxiety experiences (Zilberstein, 2014). Supporting this perspective, Winnicott (1971) also argued early relationship

experiences and presented the terms of *good enough mother* and *holding environment*. If there is a good enough mother that is available for child's needs, supports and serves a secure base, the child can form a secure bond and experience holding environment (Winnicott, 1971). As its counterpart in the therapeutic relationship can be thought of as the therapist's being supportive and open to hearing the child's emotional needs, creating a holding therapy environment.

As being differentiated from the term therapeutic alliance in adult psychotherapy, therapeutic alliance in child literature is argued to be putting more emphasis on emotional bond between the therapist and child. Contrary to adult psychotherapy setting, children are mostly brought to psychotherapy by their parents instead of their own desire for working on their inner conflicts or seeking for help (Shirk et al., 2010). Therefore, it is important to state that forming a collaborative alliance based on the tasks and works in the therapeutic process can be challenging without forming an emotional bond with the children (Green, 2006). While DiGiuseppe et al. (1996) argued that there is not enough emphasis on working alliance in child psychotherapy setting and stating that there should be a collaborative relationship aimed on common goals and tasks, it seems to both emotional bond and working task play an important role in a therapeutic process. Apart from the differences over the conceptual framework of therapeutic alliance, most authors agree that the therapeutic alliance is essential to a good therapeutic relationship and outcomes (Shirk & Saiz, 1992).

1.3.2. Empirical Literature on Therapeutic Alliance

Many studies on adult literature, finding a strong relationship between good therapeutic alliance and successful therapeutic outcome (Horvath et al., 2011; Martin et al., 2000). In contrast, the literature on therapeutic alliance in child psychotherapy is limited and restricted (Maltzman, 2016). However, the studies on therapeutic alliance in child psychotherapy literature are also mainly focused on the relationship between therapeutic alliance and therapy outcomes. A recent meta-analysis on therapeutic alliance and outcome in 28 child and youth studies between

1995 and 2017 by Karver et al. (2018) stated a random effect size of $r = .19$, which corresponds to a medium size effect. Multiple moderators were also found as the type of therapy, design (randomized controlled trials vs. non-randomized controlled trials), treatment setting (inpatient vs. outpatient) and diagnosis class. As being in parallel, in meta-analysis study by Shirk & Karver (2003) on 23 studies between 1973 and 2001 also stated a modest level of relationship between alliance and outcome with mean effect size of $r = .24$. This study also found that there was higher correlation between alliance and outcome among externalizing children. In addition to that, the results were matching with studies in adult literature (Shirk & Karver, 2003). Another previous meta-analysis study by McLeod (2011) on 38 youth studies between 1992 and 2010 found that the relationship between therapeutic alliance and outcome in youth population has mean effect size of $r = .14$ (McLeod, 2011). Due to smaller effect size found compared to the previous studies with child and adult population, the researchers argued the importance of therapeutic alliance on youth psychotherapy. Also, the researcher stated that the pre-treatment level of problems of children is found to be one of the strong moderators of the relationship between alliance and outcome. It is argued that this finding can be one of the reasons that there is higher variance of effect size among child and youth literature on therapeutic alliance and outcome relationship compared to adults (McLeod, 2011).

Supporting the relationship between therapeutic alliance and outcome, a study on 69 adolescent clients by Colson et al. (1991) also found that difficulties in therapeutic alliance were correlated with overall treatment difficulties and negatively correlated with therapeutic progress (Colson et al., 1991). Parallel with that, Noser and Bickman (2000) also found a significant relationship between therapy outcome and therapeutic alliance in a 240 outpatient youth group. Some studies also aimed to differentiate if there is a difference among the symptom types of the sample population. First, Kazdin et al. (2005) stated a relationship between alliance and externalizing problems in child cognitive behavioral psychotherapy. Being in contrast with these finds, Liber et al. (2010) found an association as stronger alliance predicted higher outcome in children with internalizing problems.

Apart from studies focused on the relationship between therapeutic alliance and outcome, it is also important to see how therapeutic alliance develops in a therapeutic process, as it is a dynamic entity. While there is extensive research on the therapeutic alliance development in adult literature, the scope of research in child literature is still restricted and lacks further research. One study by Chiu et al. (2009) was held on therapeutic alliance in cognitive behavioral therapy (CBT) for children with anxiety disorders. They have used The Therapy Process Observational Coding System for Child Psychotherapy – Alliance scale (TPOCS-A; McLeod, 2005) to assess the alliance between therapist and the child. Data from 34 children's (aged 6-13 years) parents on their levels of symptoms were gathered. The results showed that there was a link between stronger child-therapist alliance in the initial period predicted greater improvement in parent-rated outcome in mid-treatment but not in post-treatment. On the other hand, improvement on child-therapist alliance trajectory predicted greater outcomes in post-treatment, where the findings were signaling the importance of having multiple timepoints of process data in outcome and alliance research (Chiu et al., 2009).

In a recent study by Cirasola et al. (2021), researchers explored the directions of relationship between alliance and outcome in adolescents with early and subsequent timepoints. They were using data from both cognitive behavioral psychotherapy (CBT) and short term psychoanalytic psychotherapy (STPP) by comparing them with brief psychosocial intervention (BPI) as a control group. The results showed that higher early alliance ratings were related with subsequent reduction in symptoms, where the strongest relationship was in CBT, followed by STPP and it was near zero in BPI. Also, they have found that the alliance ratings of adolescents were showing growth whereas there was not significant change in the alliance trajectories of other interventions (Cirasola et al., 2021).

In the context of child psychodynamic psychotherapy, Halfon et al. (2019) studied the therapeutic alliance trajectories and associations with outcome in 89 children. They have used the Therapy Process Observational Coding System for Child Psychotherapy – Alliance scale (TPOCS-A; McLeod, 2005) for rating therapeutic alliance. The results showed that there was a quadratic trend (high-low-

high) in alliance trajectories of children in psychodynamic therapy, which was argued as there can be rupture and repair dynamics in mid-treatment. Also, there was a difference between children with externalizing problems and internalizing problems as the externalizing group were showing upwards trajectory whereas the internalizing group were showing decrease in alliance over time (Halfon et al., 2019).

In the context of the relationship between therapeutic alliance and outcome, study by Halfon (2021) investigated the effect of psychodynamic technique (PT) on therapeutic alliance and outcome in psychodynamic child psychotherapy with 79 Turkish children. The study assessed the therapeutic alliance using the Therapy Process Observational Coding System for Child Psychotherapy – Alliance scale (TPOCS-A; McLeod, 2005). The results showed that increased use of PT within a strong therapeutic alliance was linked to fewer problem behaviors, whereas within a weak therapeutic alliance, PT was associated with more problem behaviors. Also, this relationship was moderated by problem comorbidity, so for children with comorbid issues, even with a strong therapeutic alliance, increased PT use did not significantly impact outcomes. On the other hand, the study by Güvenç and Halfon (2023) examined the bidirectional relationship between mentalizing techniques and therapeutic alliance. The researchers investigated the psychodynamic therapy processes of two Turkish children with social withdrawal symptoms by using TPOCS-A for coding therapeutic alliance. The results showed that in the case with clinically significant outcomes, mentalization techniques predicted the therapeutic alliance in subsequent sessions, which in turn predicted the use of additional mentalization interventions. However, this relationship was not observed in the case that did not show significant improvement. In conclusion, both studies suggest that the relationship between therapeutic alliance and therapy outcomes differs among children with varying needs, highlighting the need for further research on this topic.

1.4. THE RELATIONSHIP BETWEEN SYNCHRONY AND THERAPEUTIC ALLIANCE

With the increasing interest and focus on the phenomenon of interpersonal synchrony, the studies on the relationship between synchrony and therapeutic alliance is gained interest in recent decades. In Mentalization-based Treatment for Children (MBT-C), therapeutic alliance is seen important to be established in the initial phase of first 3 sessions. While establishing the therapeutic alliance, it is thought to be done by the means of empathic attunement and genuine engagement with child's inner world. Some children might be too disorganized and chaotic that may make them challenging to engage in play and mentalize, which also makes the situation challenging for the therapists. In those moments, therapist's use of vocal synchrony and empathic attunement may help the children to soothe and be able to give attention to their own experience in the therapy room (Midgley et al., 2017). Therefore, the concept of nonverbal synchrony plays a role as an important part of empathic attunement in establishing the therapeutic alliance. Further research studies on the relationship between synchrony and therapeutic alliance will be discussed below.

In a study by Roten et al. (1999), the researchers developed Body Formation Coding System (BFCS), which includes four categories according to the way therapists and clients sit to evaluate their interaction on a triadic level. The research was done with adults in couple therapy and the results showed that their engagement was associated with the level of their therapeutic alliance. Therefore, this study suggests that the partners were regulating and coordinating their engagement for maintaining a stable level according to the degree of therapeutic alliance with the therapist.

In another study in psychotherapy setting, Ramseyer & Tschacher (2011) states that nonverbal synchrony in psychotherapy sessions happens more than by chance and it is associated with the quality of the relationship between therapist and client. The better quality of relationship between therapist and client, the more nonverbal synchrony of body movements happen in the sessions and both therapist

and client have their specific patterns of movement. Also, they argue that there can be an optimal level of synchrony between the dyad, which means too little or too much synchrony might signal lower quality of the relationship. Besides of the indication of relationship quality, nonverbal body movement synchrony is founded to be as related with positive therapeutic outcomes (Ramseyer & Tschacher, 2011). These findings indicate how embodiment and nonverbal synchrony show themselves in a psychotherapy setting.

In the review study by Koole & Tschacher (2016), the researchers were considering the phenomenon of interpersonal synchrony in various fields such as vocal synchrony, bodily movements and physiological processes. While considering the synchrony, they are arguing their relationship with therapeutic alliance and its role in psychotherapy context. Using the Interpersonal Synchrony (In-Sync) model, they are offering explanations of emotional sharing and communication in terms of nonverbal synchrony. Their findings suggest that Interpersonal Synchrony (In-Sync) supports the development of therapeutic alliance and affective co-regulation in therapist-client dyads (Koole & Tschacher, 2016).

In the study by Schoenherr et al. (2019), the effect of nonverbal synchrony on premature termination was investigated with the data from 267 patients with social anxiety disorder, who were treated with >20 sessions of cognitive behavioral or psychodynamic therapy. Therapy outcomes were assessed with Beck Depression Inventory and Inventory of Interpersonal Problems, where the movement synchrony was analyzed with motion energy analysis. The results showed that therapist-patient dyads with premature termination had significantly lower movement synchrony scores in initial phase of the treatment compared to the dyads completed treatment. Therefore, low movement synchrony in initial sessions were argued as potential predictors of premature termination and low therapeutic alliance. Also, sex-matching and therapeutic approach were found to be significant moderators of the relationship.

In conclusion, the findings in the literature on the relationship between nonverbal synchrony and therapeutic alliance suggests that there is a positive

relationship, where the synchrony predicts the degree of therapeutic alliance in some cases.

1.5. CURRENT STUDY

The findings on the relationship between vocal synchrony and therapeutic alliance are limited and they result from the studies on adult psychotherapy. In addition to that, the findings on these studies are contradictory. Therefore, the purpose of this study was to explore the association between vocal coordination and therapeutic alliance in mentalization-based child psychotherapy. The vocal coordination was defined as therapist's adjustment of their vocal responses with the child's expressions. The vocal coordination between the therapist and child was assessed by the vocal coordination part of the observational coding system named "Psychotherapist's Nonverbal Coordination Coding System". On the other hand, the therapeutic alliance was assessed by the "Therapy Process Observational Coding System-Alliance Scale (TPOCS-A)".

Secondly, the study aimed to examine if there is pitch synchrony between the therapist and child in selected sessions with high and low alliance. The sessions were selected from the groups of one standard deviation above the mean and one standard deviation below the mean in therapeutic alliance scores of the sessions. After that, the pitch synchrony between therapist and child in selected sessions were calculated by the computer program PRAAT, as the pitch synchrony was defined by the pitch correlation between speech turn dyads. Lastly, descriptive characteristics of the range, min-max, mean and standard deviation of the pitch content of speech turns in selected sessions were explored.

It was hypothesized that (a) nonverbal vocal coordination would positively predict therapeutic alliance, (b) child and therapist's vocal pitch would be correlated in selected sessions. Then, descriptive characteristics of pitch content in selected sessions were further explored for potential additional effects.

CHAPTER 2
METHOD

2.1. RANDOMIZED CONTROLLED TRIAL (RCT)

The current study investigating the relationship between therapist vocal coordination and therapeutic alliance in MBT-C was conducted within the scope of a randomized controlled trial recently conducted at Istanbul Bilgi University. This randomized controlled trial is a single-blind superiority experiment with parallel groups and aimed to test the effectiveness of MBT-C against a parenting and child social skills control group. The sample of the thesis will consist of clients included in this randomized controlled trial and randomly assigned to the MBT-C intervention arm. First, the design of the randomized controlled trial will be explained, and then the selection criteria of this study will be explained. For more detailed information, please refer to the clinical trial protocol in Appendix A (protocol no: NCT05290714).

2.1.1. RCT Sample Selection

The recruitment of clients and the therapies conducted in the randomized controlled trial started in March 2022 and ended in June 2023. The clients to be included in the study were selected from families who applied to Istanbul Bilgi University Psychological Counseling Center. The CONSORT (Consolidated Standards for Reporting Trials) Flow Figure showing the client recruitment process is attached (see Appendix B).

The inclusion criteria were (a) children showing clinical level problems as measured by the Child Behavior Checklist (CBCL; Achenbach, 1991), and (b) the child being between the ages of 5-12 years old.

The exclusion criteria were as follows: (a) the parent's risk of harm to self/others, psychosis level and alcohol-substance use disorder determined by the Brief Symptom Inventory (BSI; Şahin & Durak, 1994) and BAPIRT Alcohol and

Drug Scales (Ögel et al, 2017), (b) children with risk of psychosis, autism spectrum disorder, eating disorder, conduct disorder, alcohol/substance use, or risk of harm to themselves or others determined by the Affective Disorders and Schizophrenia Interview Schedule for School-Age Children (K-SADS-PL; Gökler et al., 2004), (c) the presence of ongoing physical and sexual abuse in the family, (d) the presence of cognitive impairment in the child and the parents to be included in the study as measured by the Kaufman Brief Intelligence Test (KBIT-2; Kaufman & Kaufman, 1990).

A total of 222 clients who met the criteria were included in the study. The clients were randomly assigned to either the Mentalization-Based Therapy for Children (MBT-C) intervention group or the Parenting and Social Skills (SB/E) control group in a stratified manner (age/sex/admission problems). Of the 222 accepted clients, 111 (50%) were assigned to the Mentalization-Based Therapy for Children (MBT-C) intervention group and 111 (50%) to the Parenting and Social Skills (SB/E) control group. Of the 222 clients who were randomly assigned, 11 clients (5 from the MBT-C intervention group and 6 from the SB/E control group) decided not to start treatment after assignment. These 11 clients were not included in the process analyses.

Within the group of 106 clients in the MBT-C intervention group, 3 clients were not included in the coding sample because they have only attended the first session and did not continue for the treatment. Also, 2 clients were also not included in the sample because video recordings for one of the clients were missing and the other client were having online sessions, and both of them only attended the first 3 sessions. As a result, the total sample group consists of 101 clients. Demographics of the sample group of 101 children are presented in Table 2.1.

Table 2.1. Demographic Characteristics of the Sample (N=101)

	Mean (SD)	N	%
Age			
Children's age	7.97 (1.96)		
Mother's age	37.35 (4.77)		
Father's age	40.75 (5.16)		
Therapist's age	28.88 (3.96)		
Child Sex			
Female		40	39.6
Male		61	60.4
Family Monthly Gross Income, USD[a]			
Low (<$340)			19.8
Mid-low ($340-480)			21.8
Middle ($480-600)			19.8
Mid-high ($600-750)			20.8
High ($750+)			17.8
Parent's Education			
Primary/Middle School			15.8
High School			19.3
Associate's/bachelor's degree			53.5
Master's degree			11.4
Child Problem Type[b]			
Internalizing		41	40.6
Externalizing		19	18.8

Comorbid	41	40.6
Therapist Sex		
Female	14	87.5
Male	2	12.5
Therapist Orientation		
Psychoanalytic/psychodynamic	15	93.8
Other	1	6.3
Therapist Experience (in years) 2.94 (1.69)		

Notes. Sex was dummy coded (0 = female, 1 = male).

[a] Converted from Turkish Lira (TL).   [b] Cutoff criteria for Child Behavior Checklist (CBCL) = T score > 64: Clinical (Achenbach, 1991).

2.1.2. RCT Interventions

Details of the Mentalization-Based Therapy for Children (MBT-C) or Parenting and Social Skills (SB/E) group therapy interventions randomly applied to the clients included in the randomized controlled trial are presented below.

2.1.2.1. Mentalization-Based Treatment for Children (MBT-C)

Mentalization-Based Therapy for Children (MBT-C) is a treatment that aims to improve mentalizing skills in children. MBT-C is a short-term, 15-week psychodynamic and attachment-based intervention that can be applied to children between the ages of 5-12 and their parents. In addition to the therapy with children, it also aims to improve the parent's mentalizing capacity through parallel parent work.

The therapists conducting the MBT-C intervention consisted of 16 therapists who met the criteria of having completed specialized training. Their ages ranged between 25-41 years ($M = 28.88$), 14 of them were women, and their experience level was between 1-6 years ($M = 2.94$). The therapists received a standard MBT-C training (6 sessions of 3 hours in total) given by Anna Freud Center trainers Dr. Emma Morris and Dr. Holly Dwyer Hall and received supervision from the same experts for the therapies they conducted within the scope of the study.

In the phases of the treatment in MBT-C, first 3-4 meetings form the assessment phase, where the therapist, child and parents review the reason for application, offering feedback and deciding whether they will continue with MBT-C treatment. After that, first 3 sessions assemble initial phase, where the therapist attempts to engage the child for treatment and see how the child forms play activities. In the middle phase of sessions 4-8, the aim is to increase the child's mentalization capacity while concentrating on the problem that led the child for therapy. After session 8, the therapists, parents and the child come together and review the process together to plan the continuation of treatment. In the ending phase of sessions 9-12, the focus is on preparing for the termination and discovering how the child benefit more from therapy gains after the end (Midgley et al., 2017).

2.1.2.2. Parenting and Social Skills Group (CABA)

For the control intervention, a 12-session group therapy is conducted with parents and children in separate sessions. In the parent group, parents are informed about child development and basic principles such as communication with children, emotion control, setting limits and discipline are discussed. In the children's group, the aim is on improving social skills and work on communication, developing play skills, empathy and anger management.

The therapists conducting the SB/E intervention consist of 36 therapists who meet the criteria of having completed specialized training. The age range of the group therapists was 23-38 ($M = 27$) and 95% were female. Therapists' years of experience ranged between 1-5 years ($M = 3.36$). Therapists underwent a standard training given by Dr. Yudum Söylemez and Dr. Elif Göçek for 6 sessions of 3 hours each and received supervision from the same experts for the therapies they conducted within the scope of the study.

2.1.3. Ethical Approval

The randomized controlled trial titled 'Effectiveness of Mentalization-Based Therapy for Children (MBT-C) and Mechanisms of Change' received ethical approval (no: 2021-40024-48) from Istanbul Bilgi University Ethics Committee. Written informed consent was obtained from the parents included in the study and verbal consent was obtained from the children. The questions of the families about participation in the study and the details of the study were answered. The data obtained within the scope of the study were kept in accordance with the principle of confidentiality.

2.1.4. Data Collection

In the randomized controlled trial (RCT) study, demographic information and outcome scales were first collected from the parents and children before treatment (baseline, Timepoint 0). Then, data on process and outcome scales were also collected at mid-treatment (week 8, Timepoint 1) and end of treatment (week 12, Timepoint 2) stages. Through the intervention process, all sessions were audio and video recorded.

In the context of the current study, same 3 timepoints of Time 0, Time 1 and Time 2 were used to code sessions on therapeutic alliance (TPOCS-A) and nonverbal vocal coordination. The coding for process measures were conducted by trained research assistants through watching video recordings of the sessions and reviewing verbatim transcriptions of the sessions. If the corresponding session to a timepoint was not available due to a problem with the recording, or if it was an online session or the client was absent and the session was not conducted, the next or previous session was assessed.

For the pitch synchrony analysis, sessions were categorized as high alliance sessions which have scores above +1 standard deviation from the mean, and low alliance sessions which have scores below -1 standard deviation from the mean in the TPOCS-A alliance scores distribution. Then, 2 sessions from high alliance group and 2 sessions from low alliance group were selected by taking the dyad's sex into account. To avoid any voice register differences in therapist and child's, same-sex dyads of female therapists and children were selected.

2.2. MEASURES

Below are the details of the measures in this thesis. The clinical trial protocol for all measurement tools used in the randomized controlled trial can be found in Appendix A (protocol no: NCT05290714).

2.2.1. Sociodemographic Information Form

The sociodemographic information gathered about age, sex, history of seeking psychological or psychiatric help and school grade of the child. On the other hand, information about the age, educational level, marital status of the parents and family's monthly gross income were collected through a standard demographic information intake form.

2.2.2. Assessment and Outcome Measures

2.2.2.1. Child Behavior Checklist (CBCL)

This scale was developed by Achenbach (1991) and is widely used for assessing emotional and behavioral problems in children. It is used to identify the child's internalizing (social introversion, somatic problems, anxiety/depression, etc.), externalizing (distractibility, aggressive behaviors, etc.) and total problems. The scale exists in two versions: one for children aged 1.5-5 years (see Appendix C) and another for children aged 6-18 years (see Appendix D). The version for ages 1.5-5 contains 99 items, while the version for ages 6-18 includes 112 items. It is scored on a 3-point Likert system (0 = Not true, 1 = Sometimes or somewhat true, 2 = Very or often true).

The raw scores corresponding to the 50th percentile for the subscales including internalizing, externalizing and total problems were converted into standardized T-scores (Achenbach, 1991). Accordingly, T-scores between 60-64 were determined to be in the Borderline clinical range and T-scores between 65-100 were determined to be in the Clinical range.

The internal consistency coefficient ($\alpha = .97$) and test-retest reliability ($r = .94$) of the original scale were shown to be high (Achenbach & Rescorla, 2000). The Turkish adaptation study of the CRS was conducted by Erol et al. (1995) for the 6-18 age group. In these adaptations, the internal consistency ($\alpha = .88 - .95$) and test-retest ($r = .84$) values were adequate (Erol et al., 1995). The internal

consistency coefficients for internalizing, externalizing and total problems measured in this study were .87, .91 and .95, respectively.

2.2.3. Process Measures

2.2.3.1. Psychotherapist's Nonverbal Coordination Coding System

The scale was developed by Catay, Downing & Steele (2023) and it measures how the psychotherapist uses their body, dynamic movements and their facial and vocal expressions to support the overall goals of psychotherapy. Also, it measures if the therapist appropriately respond to the nonverbal qualities that the child exhibits during the session.

It is an observer-based rating system in which trained coders watch video recordings of child psychotherapy sessions and provide a 3-point rating to the nonverbal traits of the therapists. Trained coders reviewed three sessions per child from the initial, middle, and end phases of therapy. Within each session, a 6-minute segment was analyzed, consisting of 3 consecutive minutes from the beginning and 3 consecutive minutes starting from 30th minute of the session. If these minutes could not be coded due to difficulty in seeing the therapist or the child due to the camera angle, the closest corresponding minutes were coded.

For all variables, a rating of 3 indicates 'good coordination', which includes nuanced, well-articulated, highly attuned, purposeful use of nonverbal movement qualities and high degree of flexibility and a wide range in the use of nonverbal qualities. Rating of 2 is considered as 'satisfactory coordination', where the clinician's use of body is to be mostly coordinated with the child in a way that is good enough to keep the interaction, play, exploration going, but without any significant contribution. There might be slight uncoordinated moments but these are not significantly affecting the play. On the other hand, a rating of 1 indicates 'unsatisfactory coordination', where the therapist is mostly uncoordinated with the movement qualities of the child. Therapist might be too passive, delayed, disengaged, with closed body shape or with poor positioning in the room.

Five categories of therapist's nonverbal coordination are assessed by this system. These consist of the following: Location; Body Shape; Movement Dynamics (Timing, Use of Force/Weight, Use of Gaze/Space); Facial Coordination, and Vocal Coordination. For the aim of this study, only the Vocal Coordination scores from the coding system will be used. Vocal coordination scores are given based on the concepts of tempo, use of rhythmic quality, variations in pitch, variability on intensity, use of punctuation, use of melodic quality and the degree of vocalizing. Good vocal coordination scores of 3 indicate skillful, nuanced, sensitive and responsive use of vocal coordination in a way that communicates openness, playfulness, responsiveness and makes an active contribution to the interaction, expression or child's state of regulation, engagement, quality of play or processing. On the other hand, unsatisfactory vocal coordination scores of 1 indicates that clinician's use of vocal coordination may lack in range, can be rigid, fixed, show significant lack of rhythmic, melodic qualities or there may be too little vocalization which can lead to a sense of disconnection or too much of it as being too intrusive.

The coding system is developed under the study "Therapist Nonverbal Coordination in Psychodynamic Child Psychotherapy: Its Connection to Children's Symbolic Play, Affect Regulation and Outcome" by Ph.D. Zeynep Çatay. The intercoder reliability training took place from October 2022 through March 2023. 8 graduate level coders were trained through online training meetings that took place weekly for 1,5 hours. The training involved reviewing coding criteria, engaging in embodied exercises, viewing sample videos, coding them as a group and independent video coding assignments. The initial training phase took approximately 50 hours in total. The interrater reliability coefficient (ICC) in the training process was at least .70. After the training process, coders were randomly assigned to groups of 2 people. For data analysis, an average vocal coordination code was calculated for each session by averaging the codes assigned by the coders. The interrater reliability coefficient (ICC) in the coding process was calculated as .95 (Min = 0.70, Max = 1.00, *SD* = 0.08). During the coding process coders'

meetings were held every other week in order to prevent rater drift and to discuss the coding for minutes that could not be resolved by the coder dyad.

2.2.3.2. Turkish Form of the Therapeutic Alliance Observational Coding System (TPOCS-A)

TPOCS-A is a scale that uses session observation to assess the alliance between therapist and child. It has 9 items about the relationship of the dyad in the session. Items such as how much positive emotion the child expresses toward the therapist in the session, how uncomfortable the dyad appears in their interactions with each other, or how well the dyad works together on therapeutic tasks are coded. The items are rated on a 6-point Likert scale (0=not at all to 5=a great deal). Original items of the scale has good intraclass correlation ranged from .52 to .82 (McLeod et al., 2021) Turkish Form of the TPOCS-A has good internal consistency of .73 (Halfon et al., 2020). In the current study, the codings were made by 6 graduate level research assistants in clinical psychology master's program. The coders had 6 hours of theoretical and practical training from coding educators. The interrater reliability coefficient in the training process was at least .70, coders with a minimum ICC value of .70 were participated in coding. After the training process, codings were made by randomly created groups of 2 people. Then, the coders were randomly assigned to sessions and the analysis was done by taking mean scores of the pairs. The interrater reliability coefficient (ICC) in the coding process was calculated as .91 (Min = 0.71, Max = 1.00, SD = 0.05) and the measure had good internal consistency (α = .87).

2.2.3.3. Vocal Pitch Synchrony

For extracting F0 values and calculating vocal pitch synchrony between the therapist and child, a computer software called PRAAT (Boersma & Weenink, 2012) is being used. PRAAT is a program developed to study acoustic measurements of audio recordings in terms of their pitch, intensity and rhythm. For the aim of current study, fundamental frequency (f_0) values are extracted from the audio recordings of the selected sessions. The fundamental frequency, F0, represents the rate at which the vocal cords oscillate when producing voiced speech sounds, which shows how high or low the one speaks in terms of their pitch (Lee & Humes, 2012). On the other hand, a speech turn is one part of the dialogue where the speaker continues their speaking without an interruption. The minimum duration of speech turn or silence is 250 milliseconds. The threshold is decided as 250ms as other studies also used around this threshold (Holtz, 2003; Jaffe et al., 2001). Figure 2.1 shows the software interface and how labeling of the speaker and fundamental frequency curves look like.

Figure 2.1. PRAAT Software Interface, Waveform, Fundamental Frequency Curves and Speaker Labeling (T= Therapist, C= Child)
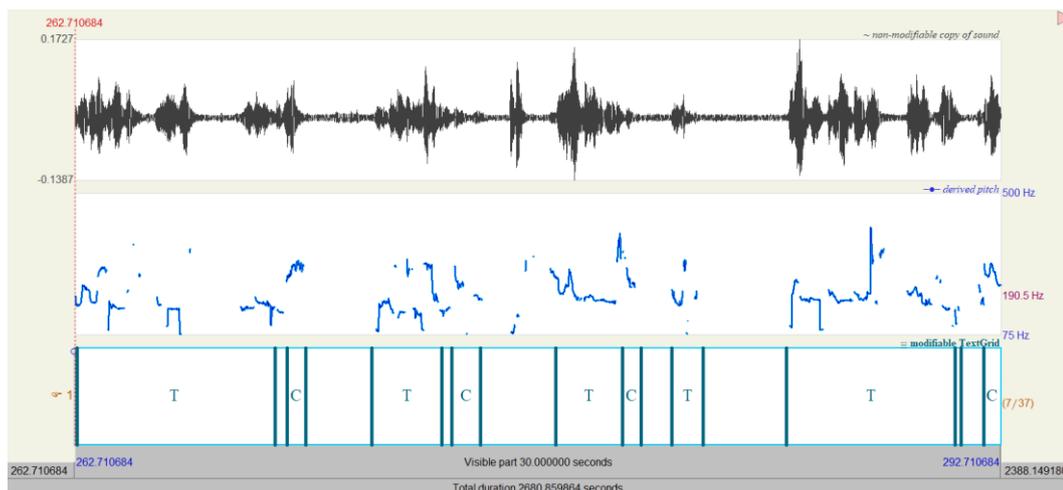
For analyzing the pitch synchrony scores for selected sessions, audio recordings of the sessions were used. As both the therapist and client speech is

recorded by the same audio recorder device in a single audio track, a manual labeling to identify the durations therapist and client talks was needed. Therefore, as a first step, the parts where therapist and child talks in each session was manually labeled as T and C. When labeling, the threshold of 250ms was used as the minimum duration of vocalization. The labelling process took approximately 3-4 hours for each session. After the labelling process, fundamental frequency (f_0) values for each speech turn was calculated with the PRAAT software. As a data analytical procedure, the correlation between f_0 values of each speech turn dyads of therapist and client was calculated to have an overall pitch synchrony score for each session.

In addition to that, therapist-leading and therapist following synchrony values were analyzed as the previous studies in the literature differentiated these two synchrony scores from the overall synchrony score. Therapist-leading score is consisted of the speech turn dyads that are first elicited by therapist's question or comment while therapist-following score is consisted of the speech turn pairs of the dyad where the therapist is mirroring the child's statement or gives an answer to child's question.

CHAPTER 3
RESULTS

3.1. DATA ANALYSIS

The first hypothesis examining the relationship between nonverbal vocal coordination and therapeutic alliance within the MBT-C framework was tested with a multilevel modeling analysis. Multilevel modeling is a frequently used method for longitudinal data that produces interdependent results in psychotherapy research (Tasca & Gallop, 2009). In this multilevel modeling analysis, sessions were nested within clients and clients were nested within therapists. Before conducting the analyses, three-level and two-level 'null' models were tested to see which model was more appropriate for the data.

Since many clients worked with the same therapists, the three-level model was tried first in order to measure the variance in the data that may be due to therapists. In this model, sessions were defined as Level 1, clients as Level 2, and therapists as Level 3. Therapeutic alliance measures (TPOCS-A) were separately assigned to these three-level models as dependent variables and the models were run without predictor variables. It was concluded that therapists explained less than 1% of the variance in the null model for therapeutic alliance scores ($p = .356$). In contrast, in the two-level model (when Level 1 sessions were nested within Level 2 clients), it was found that clients explained approximately 35% of the variance for TPOCS-A (TPOCS-A ICC: .34.7, $p < .001$). For this reason, it was concluded that the two-level model was more appropriate for multi-level modeling analyses, and a two-level model was used to examine Hypothesis 1.

In the model, there are three time points for TPOCS-A (Time 0, Time 1 and Time 2). Therefore, the first level variables consist of these repeated measures ($n = 269$) and the second level variables consist of client-level variables ($n = 101$).

The second hypothesis was testing whether pitch synchrony existed in selected sessions of high and low alliance. For that, four sessions were chosen from the dataset, using the TPOCS-A alliance ratings as criteria. Two sessions were

drawn from the group with the lowest alliance scores, falling one standard deviation below the mean, while two sessions were selected from the group with the highest alliance scores, from the group above one standard deviation above the mean. After selecting the sessions, the sessions were manually labelled in terms of each speech turn of the speaker and the type of synchrony. Therefore, the segments were created to calculate the mean pitch frequency for each speech turn. While labelling, consecutive speech turn dyads were also categorized as therapist-leading and therapist following. Therapist-leading dyads include speech turn pairs initiated by the therapist's questions or comments. On the other hand, the therapist-following dyads comprise the speech turns where the therapist reflects the child's words or answers their questions. Thus, there were 3 categories of speech turn pairs; therapist-leading and therapist-following categories and an overall category including every speech turn pair in the session. To extract the mean pitch frequency values, the computer program PRAAT was used. Then, mean pitch frequency values of each consecutive speech turns were collected in a file. Lastly, the correlation between consecutive speech turn dyads were calculated using IBM SPSS Statistics (Version 26).

Also, before analyzing the pitch synchrony scores for the selected sessions, the effect of duration of speech turns were checked as the number of speech turns among sessions were varied. For this procedure, duration values (in seconds) for each speech turn dyads (IPUs) of therapist and child in a selected session were added to have a duration variable for each IPU. Then, the correlation between the duration variable and frequency values were analyzed to see if there is a significant relationship between the duration of speech turns and pitch values. However, the correlation between two variables was non-significant, $r(50)= .007$, $p > .5$. Therefore, the duration variable was not added as a control variable while analyzing pitch synchrony scores.

Lastly, to explore the pitch characteristics of speech turns in selected sessions with high and low alliance, descriptive statistics of range, min-max, mean and standard deviation for each speaker were calculated using IBM SPSS Statistics (Version 26).

3.2. RESULTS

3.2.1. Nonverbal Vocal Coordination and Therapeutic Alliance

Descriptive scores for nonverbal vocal coordination scores and TPOCS-A alliance scores are presented below in Table 3.1. The possible maximum score that can be obtained from TPOCS-A was 45.00; on the other hand, the possible maximum score for vocal coordination was 3.00.

Table 3.1. Descriptive Statistics of Nonverbal Vocal Coordination and TPOCS-A Scores

	N	Mean	SD	Min	Max	Skewness		Kurtosis	
						Statistic	Std	Statistic	Std
Voc. Coord.	269	2.08	0.37	1.00	3.00	.143	.149	.537	.296
TPOCS-A	269	27.46	5.78	6.00	38.00	-1.11	.149	1.56	.296

Note. Std = Standard error.
Voc. Coord. = Vocal Coordination

Three different time points were used for each client to capture the effect of nonverbal vocal coordination on the change of therapeutic alliance scores. In addition, it was decided to include client-level variables as control variables in the model: accordingly, the age and sex of the child were added to the model as second-level variables. The age and sex of the child were selected as the control variables for the reason that they were founded to have a relationship with therapeutic alliance in child psychotherapy (Abrishami & Warren, 2013; Accurso & Garland, 2015; Langer et al., 2011). Therefore, the formula for measuring the effect of nonverbal vocal coordination variable on therapeutic alliance scores in two-level modeling is as follows:

Level 1 : $\text{TPOCS\_A}_{ti} = \pi_{0i} + \pi_{1i}*(\text{VOCALCOO}_{ti}) + e_{ti}$

Level 2 : $\pi_{0i} = \beta_{00} + \beta_{01}*(\text{AGE}_i) + \beta_{02}*(\text{SEX}_i) + r_{0i}$

$\pi_{1i} = \beta_{10}$

The scores of TPOCS-A scales were analyzed by assigning them as dependent variable in the models. The equation reflects the alliance score of client i with TPOCS-A in session t. β_{00} is the intercept of the regression equation and β_{03} is the main effect of the vocal coordination.

The findings showing the predictive effect of nonverbal vocal coordination on the therapeutic alliance are presented in Table 3.2. According to the results of the multilevel modeling analysis conducted with this formula, it was found that nonverbal vocal coordination significantly predicted the therapeutic alliance (TPOCS-A scores). Nonverbal vocal coordination scores have a positive and significant effect on TPOCS-A therapeutic alliance scores ($p = .006$). These results show that there is a significant positive relationship between the therapist's vocal coordination scores and the therapeutic alliance scores obtained during the therapy process.

Table 3.2. Summary of Multilevel Model Predicting Therapeutic Alliance (TA) by Age, Sex and Vocal Coordination

Intercept and Predictors	TA		
	ß	*SE*	*t*
Intercept (β_{00})	30.06	1.35	22.35**
Age (β_{01})	1.03	.20	5.10**
Sex (β_{02})	-1.62	.81	-2.01*
Vocal Coordination (β_{03})	3.59	1.29	2.78**

Note. Sex was dummy coded as "1" = female, "2" = male.
* $p < .05$, ** $p < .01$.

In addition to the significant relationship between vocal coordination and therapeutic alliance, controlling variables of age and sex have also a significant relationship with therapeutic alliance. Results show that older children have higher therapeutic alliance scores than younger ones ($p < .001$), and female children has higher therapeutic alliance scores than male children ($p = .047$).

3.2.2. Pitch Synchrony

Session A and Session B were the examples of sessions with strong therapeutic alliance, whereas Session C and Session D were examples of sessions with weak therapeutic alliance.

In the pitch synchrony analysis, Session A showed a significant correlation in overall synchrony score ($p = .03$). Significant correlation was found in Session B for overall ($p < .001$) and therapist-following scores ($p < .001$). In the weak therapeutic alliance sessions, all three synchrony scores of overall, therapist-leading and therapist-following were significantly correlated. Session C showed significant correlation in pitch for overall ($p = .003$), therapist-leading ($p = .016$) and therapist following ($p = .049$) scores. Lastly, Session D also showed significant correlation in overall ($p = .005$), therapist-leading ($p = .017$) and therapist-following ($p = .04$) synchrony. Scores of overall, therapist-leading and therapist-following synchrony correlation coefficients are presented below in Table 3.3.

Table 3.3. Correlation Coefficients for Pitch Synchrony

	Overall	Therapist-Leading	Therapist-Following
Session A	0.272*	0.263	0.270
Session B	0.322**	0.122	0.420**
Session C	0.251**	0.316*	0.224*
Session D	0.323**	0.338*	0.451*

Note. Session A and B = High alliance, Session C and D = Low alliance
*= $p < .05$, ** = $p < .01$

3.2.3. Exploratory Analysis of Pitch Characteristics

In the exploratory analysis of pitch characteristics of each speaker in each session, descriptive statistics of range, min-max, mean and standard deviation were explored. These parameters were selected as they were potentially good indicators

for understanding the pitch characteristics of the speaker within a session. The range parameter is the difference between minimum and maximum mean pitch used in the session, which can indicate the width of pitch variety. On the other hand, mean of the pitch content demonstrates how high or low the speaker is speaking in overall term. Lastly, standard deviation indicates the amount of variation in the mean frequency values of speech turns. Descriptive statistics for pitch content of the therapist and child for each session is presented in Table 3.4 below.

Table 3.4. Descriptive Statistics of Speech Turns and Mean Frequencies

	Alliance	N	Mean	SD	Min	Max	Range
Session A_T	37.00	64	259.85	45.48	185.60	418.50	232.90
Session A_C		64	232.57	29.43	159.90	311.30	151.40
Session B_T	36.50	132	224.13	26.51	156.80	326.80	170.00
Session B_C		132	237.73	27.85	180.10	348.20	168.10
Session C_T	11.00	137	215.72	35.23	143.10	315.10	172.00
Session C_C		137	291.53	47.59	156.50	392.00	235.50
Session D_T	13.50	74	226.81	39.07	149.40	307.20	157.80
Session D_C		74	260.38	60.91	120.70	376.80	256.10

Note. T = Therapist, C = Child

For the pitch content of therapist and child in the sessions, the descriptives show that children in strong therapeutic alliance sessions uses a narrower pitch range in the session, whereas children in the weak therapeutic alliance sessions uses a broader pitch range, as it is illustrated in Figure 3.1.

Figure 3.1. Mean Pitch Range of Children in Each Session
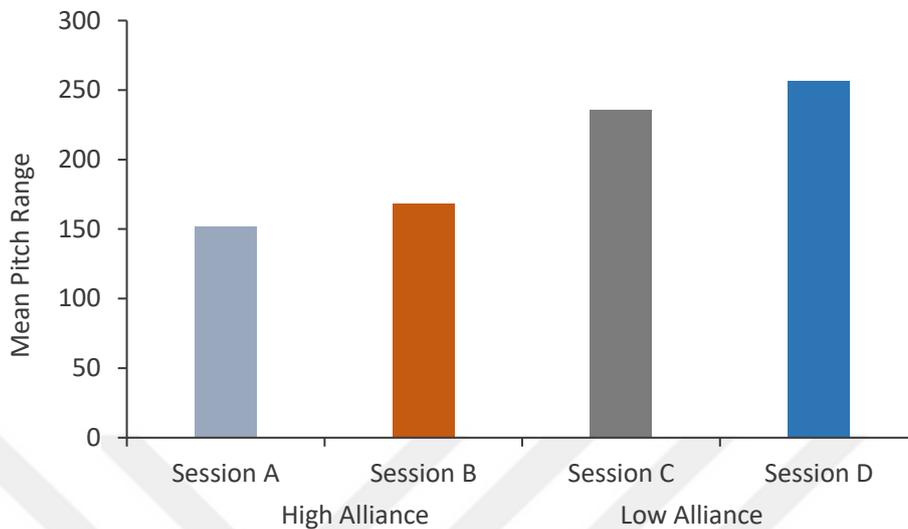
Secondly, as shown in Figure 3.2, the average pitch of children's speech was higher in sessions with a weak therapeutic alliance compared to sessions with a strong therapeutic alliance.

Figure 3.2. Mean Pitch of Children in Each Session
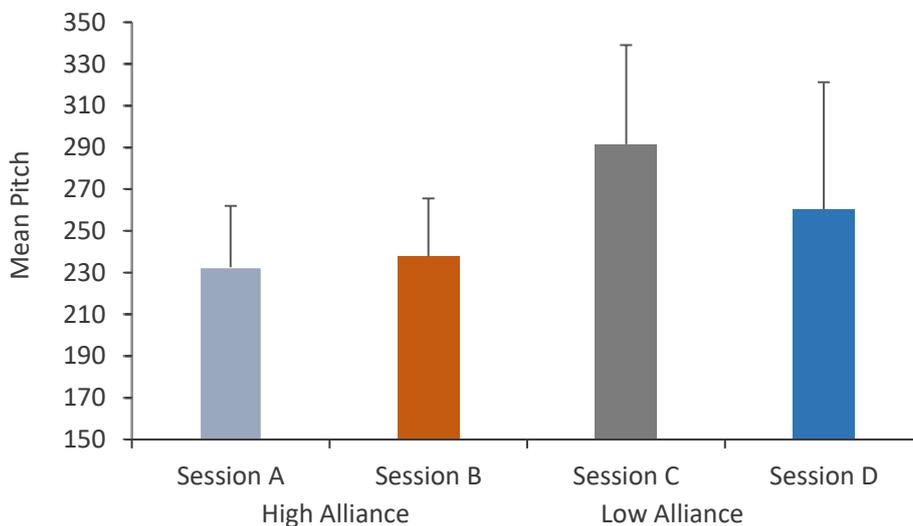
Lastly, the pitch content of children in weak therapeutic alliance sessions shows higher standard deviation compared to the children in the strong alliance sessions. It is illustrated in Figure 3.3.

Figure 3.3. Pitch Standard Deviation of Children in Each Session
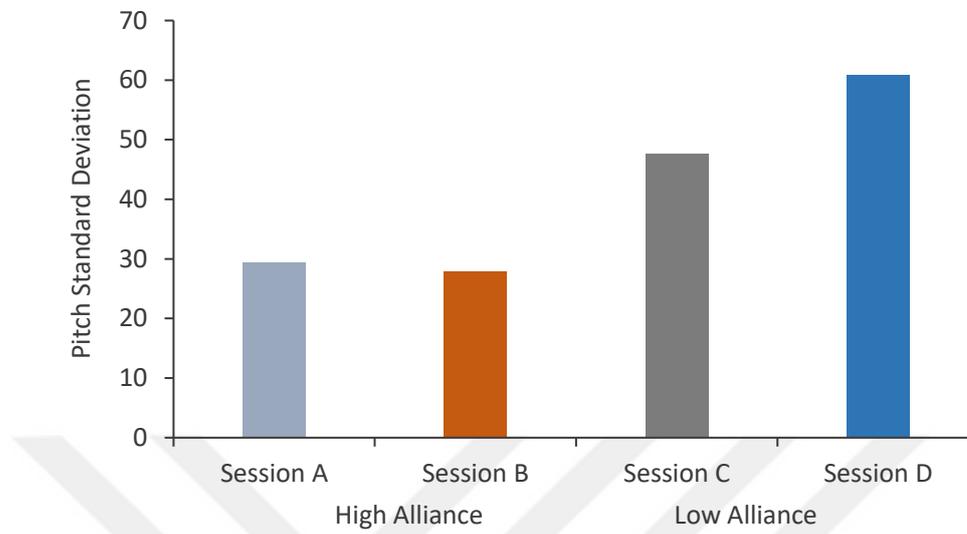
To visualize the pitch content of therapist and child in the sessions selected, the line graphs of the mean pitch of speech turns for each session can be found below. In sessions A and B, where the therapeutic alliance is high, child's vocal pitch behavior has less variance and narrower range. In contrast, the vocal pitch behavior of children in low alliance sessions of Session C and D are more dysregulated and has broader range compared to the high alliance context.

Figure 3.4. Line Graph of Vocal Pitch in Session A
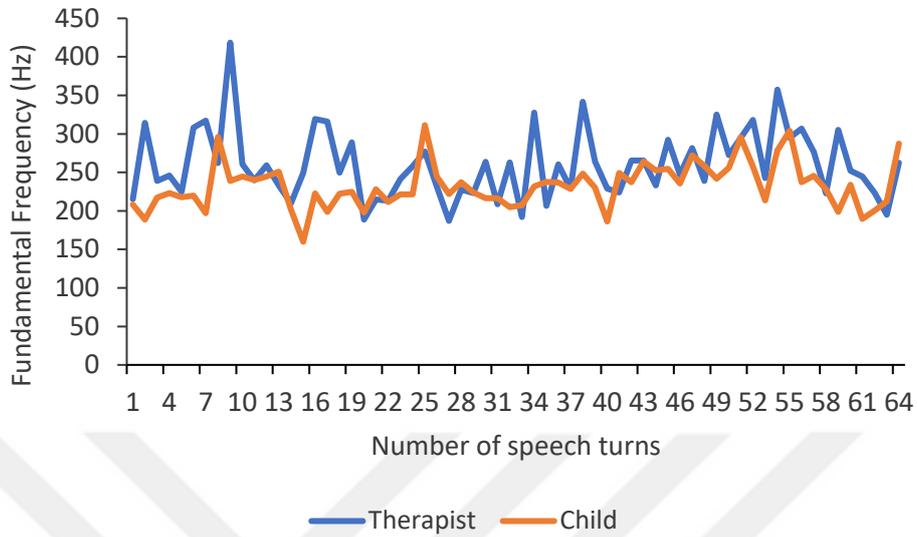
Figure 3.5. Line Graph of Vocal Pitch in Session B
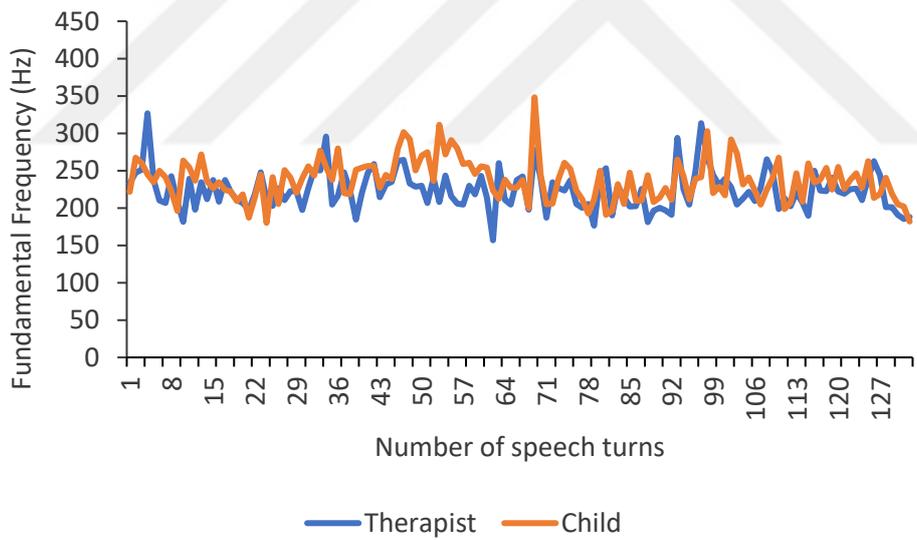
Figure 3.6. Line Graph of Vocal Pitch in Session C
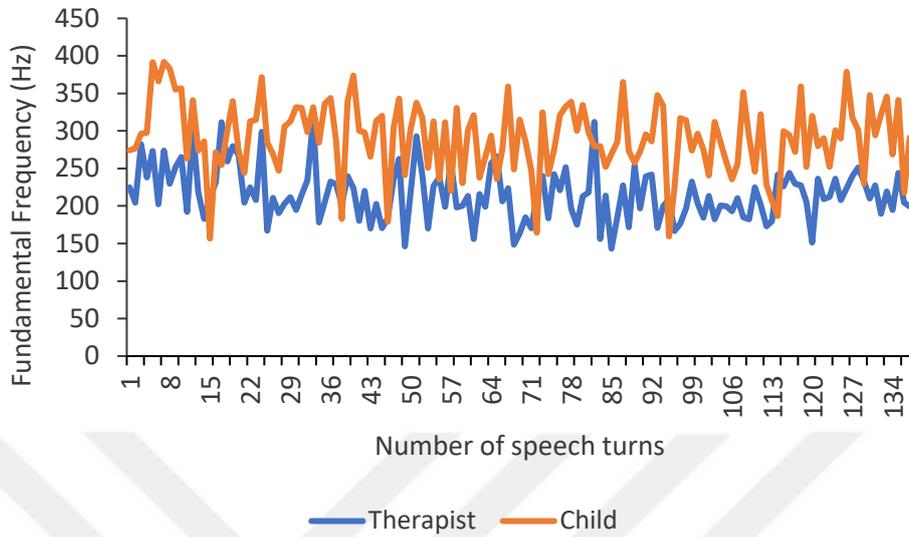
Figure 3.7. Line Graph of Vocal Pitch in Session D
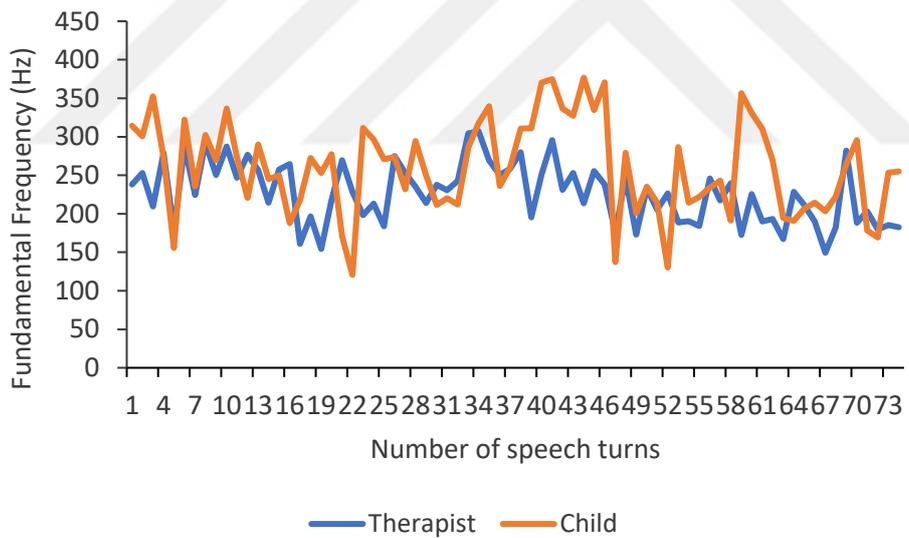
CHAPTER 4
DISCUSSION

The aim of this study was to explore the relationship between vocal coordination, pitch synchronization and therapeutic alliance in child psychotherapy. It was hypothesized that (a) nonverbal vocal coordination would positively predict therapeutic alliance, (b) child and therapist's vocal pitch would be correlated in selected sessions. Then, descriptive characteristics of the pitch content in the selected sessions were explored.

Vocal coordination was coded based on assessing variety of parameters such as use of tempo, rhythm, pitch, volume and quantity of vocalizations. the results showed that the vocal coordination between the therapist and child positively predicts the therapeutic alliance; and age negatively predicts therapeutic alliance while sex predicts therapeutic alliance as females has higher alliance scores than males.

Also, the in-depth analysis of pitch synchrony comparing the sessions with strong and weak therapeutic alliance showed that the dyads had higher pitch synchrony in weak therapeutic alliance context. The analysis of pitch content showed that the children in weak alliance context used wider pitch range, had higher mean of their fundamental frequency through the session and displayed higher standard deviation in their use of pitch. In this section, the results of the hypotheses and the exploratory analysis of vocalization and pitch synchrony will be discussed in detail.

4.1. HYPOTHESES

4.1.1. The Relationship Between Vocal Coordination and Therapeutic Alliance

One of the goals of this study was to examine the relationship between therapist's vocal coordination and therapeutic alliance in mentalization based child psychotherapy. The results of the multilevel modeling analysis supported our hypothesis that the nonverbal vocal coordination of the therapist predicts the therapeutic alliance. In other words, therapists' use of vocalization and vocal attunement are associated to therapeutic alliance.

Although there is no previous study in predicting the relationship between vocal coordination and therapeutic alliance in the context of child psychotherapy, there are some studies on the relationship between vocal synchrony and therapeutic alliance in adult psychotherapy literature. Most of the studies in the adult psychotherapy literature have reported that there is a positive effect of vocal synchrony on therapeutic alliance and empathy (Bryan et al., 2018; Imel et al., 2014; Xiao et al., 2013; Xiao et al., 2015), which supports our findings on the positive relationship between vocal coordination and therapeutic alliance. On the other hand, the study by Pérez-Rosas et al. (2017) found a negative relationship between pitch synchrony and empathy ratings, and Reich et al. (2014) found that there is a negative correlation between the vocal pitch synchrony and therapeutic alliance in adult psychotherapy process.

One of the reasons our results contradict the previous literature on the negative correlation between vocal synchrony and therapeutic alliance might be that those studies in the context of adult psychotherapy specifically focus on one aspect of vocal coordination, such as pitch synchrony. In contrast, the coding system utilized in this study (Psychotherapist's Nonverbal Coordination Coding System, Catay et al., 2023) takes into account a broader spectrum of vocal coordination aspects, including tempo, speed, pitch variation, intensity, punctuation, melodic quality, and the degree of vocal expression. Therefore, the coding system relies not on measuring frequencies or decibels, but on observational data from coders

assessing the quality of the therapist's vocal coordination. Furthermore, the vocal coordination scores in the coding system are context-dependent, meaning they are based on the immediate interaction between the dyad. For instance, a therapist's minimal vocalizing within a minute might be coded as good coordination if it actively contributes to the child's regulation. However, the same amount of vocalization might be coded as unsatisfactory coordination in a different context if it leads to a sense of disconnection between the therapist and the child. Thus, the dataset is unique in its way of coding and gathering data from the video recordings.

The fact that the relationship between vocal coordination and therapeutic alliance was found in the context of MBT-C may have some implications within the principles of the therapy model. As mentioned before, one of the aims of the MBT-C is to improve the capacity of mentalizing for children (Midgley et al., 2017). In terms of the interventions used, implicit mentalization skills, in which the therapist uses nonverbal elements extensively such as body posture or tone of voice, come to the fore in MBT-C interventions of attention control and emotion regulation. When performing these nonverbal interventions in MBT-C, synchrony and attunement between the child and the therapist play an important role. In this context, the results of the current study may indicate that vocal coordination in MBT-C might be an important part of synchrony and attunement for establishing the therapeutic alliance with the child.

Also, there exists a theoretical foundation regarding the relationship among vocal synchrony, attunement, and therapeutic alliance. In the context of infant-caregiver interaction, when infants and their primary caregivers interact in a synchronized manner, it contributes to building social relationships (Feldman, 2007). As its reflection in a therapeutic relationship, many researchers have concluded that nonverbal behavior of therapists plays a crucial role in forming and sustaining a therapeutic alliance in psychotherapy (Philippot et al., 2003). Therefore, as the result of the current study supports, the therapist's vocal coordination seems to lay the groundwork for the establishment of a therapeutic alliance in child psychotherapy.

4.1.2. The Associations Between Pitch Synchrony and Therapeutic Alliance

In the context of the relationship between pitch synchrony and therapeutic alliance, the study aimed to conduct an exploratory analysis of pitch synchrony in 4 selected sessions with low and high therapeutic alliance, by 2 sessions from each. During the analysis, a correlational study of the therapist's and child's mean pitch values was conducted using their speech turns as sample units, consistent with the standard method employed in previous research on pitch synchrony (Imel et al., 2014; Reich et al., 2014; Schoenherr et al., 2021). The analysis showed that dyads were tended to exhibit greater and more significant pitch synchrony in low alliance sessions than in high alliance sessions.

In MBT-C, establishing a therapeutic alliance is thought to be achieved through empathic attunement and genuine interaction with the child's inner world. While working with children who are too disorganized and chaotic in the therapy room, therapist's use of empathic attunement and vocal synchrony is thought to be one of the possible interventions that might be helpful (Midgley et al., 2017). In this context, the finding that pitch synchrony between the therapist and child is higher in low alliance sessions might be discussed as reflecting a greater need for empathic attunement and vocal synchrony.

To our knowledge, there is not any study on the relationship between pitch synchrony and therapeutic alliance in child psychotherapy literature, therefore, the studies in adult psychotherapy on pitch synchrony and therapeutic alliance can be mentioned. In the study by Reich et al. (2014), higher levels of pitch synchrony was founded to be related with poorer therapeutic relationship. Moreover, Schoenherr et al. (2021) founded that high pitch synchrony had a negative influence on alliance and outcome. Thus, the results of the previous literature presented above support the results of this study. However, the current study contributes to the literature as bringing information about the qualities of pitch synchrony in child psychotherapy context while comparing low and high therapeutic alliance situations.

On the other hand, Imel et al. (2014) stated that vocal pitch synchrony between therapist and client was founded to be positively related with therapist

empathy rated by the observers. Furthermore, Bryan et al. (2018) founded that higher pitch synchrony was related with patient rated working alliance. The reason why our results contradicts with these findings might be that the constructs in these studies are different than ours, which are observer rated therapist empathy and patient rated working alliance. However, the construct examined in this study is observer rated therapeutic alliance, which is coded by the trained observers with the video recordings of the sessions. Therefore, it can be a reason for why the results of these studies are opposing results of the current study. Secondly, the difference between the context of adult psychotherapy and child psychotherapy can be another reason for this contradiction. The relationship established with the child in MBT-C differs from adult therapy in terms of the stance taken by the therapist, where the therapist shows a sincere engagement in the relationship to connect with the child's subjective experiences through attunement. Additionally, children may have a greater developmental need for nonverbal interventions and synchrony compared to adults, a need that is addressed in MBT-C (Midgley et al., 2017). Therefore, the differences in the quality of relationship in child psychotherapy and the greater need for nonverbal interventions might explain why these results conflict with previous findings in adult literature.

Another finding of the current study is that therapist-leading synchrony is significant and higher in low alliance sessions however it is lower and not significant in high alliance sessions. This finding could be contextualized within MBT-C, where therapists employ implicit mentalization through their tone of voice and utilize vocalizations to facilitate child engagement and regulation. It might suggest that therapists may adopt a more proactive stance, taking the lead in providing support and involving the child in low alliance sessions. In terms of the previous literature, this finding is matching with what Reich et al. (2014) was reporting, as the only significant relationship between the pitch synchrony and therapeutic alliance was in the therapist-leading pitch synchrony. An explanation of this result can be that if clients perceive a rupture in the therapeutic alliance, they might react by becoming more in tune with the therapist's behavior, attempting to restore the relationship (Safran et al., 2011). On the other hand, if the dyad already

has a strong therapeutic alliance, they don't need to be perfectly attuned to each other, which means they can be more flexible in their use of vocal behavior. This explanation of the finding is also can be thought in terms of the psychoanalytic literature as the period we need the perfect attunement or harmonious dyadic interaction most is the infancy, where the one is more agitated and regressed (Sroufe & Rutter, 1984). Therefore, the need of the children to be attuned to the therapist more in the low alliance situation can be understood as a result of the agitated and dysregulated emotional state.

4.1.3. The Characteristics of Pitch Content and Therapeutic Alliance

Exploratory analysis of the pitch synchrony between the child and the therapist, which was one of the aims of the study, also provided results regarding the acoustic properties of children's speech in the low alliance and high alliance sessions, in terms of descriptive statistics. Firstly, it was observed that children in low therapeutic alliance sessions showed higher standard deviation in their mean pitch of the speech turns. Second finding was that in sessions with a low therapeutic alliance, the average pitch for children is higher compared to sessions where the alliance is stronger.

As the first finding suggests, higher standard deviation in the mean pitch values of speech turns of the children in low therapeutic alliance sessions can be discussed in terms of emotional intensity changes. The fundamental frequency of the speech is found to be an indicator of emotional intensity (Juslin et al., 2005). Therefore, more variations in mean pitch of the speech turns can be thought as more variations in the intensity of emotions in the session. In the study by Bryan et al. (2018), it is reported that in the intervention sessions for acutely suicidal military personnel, stronger emotional bond between the clinician and the patient was linked to the clinician's ability to regulate the patient's emotional arousal, resulting in less pronounced fluctuations in the patient's vocal pitch. Therefore, the finding supports that lower variations in vocal fundamental frequencies might be a sign of an association with emotion regulation.

Second finding was that the mean value of the speech turns for the children in low therapeutic alliance sessions had higher mean values than children in high therapeutic alliance sessions. This finding can also be thought in the frame presented above, as the higher fundamental frequency is founded to be related with higher intensity of emotions (Juslin et al., 2005). Therefore, it might be that children in the low alliance sessions were expressing higher intensity of emotions during the session, compared to the children in high alliance sessions. This finding might suggest an association between mean pitch during the session and emotional intensity.

4.1.4. The Associations Between Age, Sex and Therapeutic Alliance

Age and sex were the control variables in the study while conducting a multilevel analysis on the relationship between therapist's vocal coordination and therapeutic alliance. As a result, both variables were significantly predicting the therapeutic alliance. Age exhibited a positive correlation with therapeutic alliance scores, indicating that older children tended to have higher levels of alliance with their therapists. Moreover, girls were having significantly higher therapeutic alliance scores than boys.

Firstly, the results showed that children age positively predicts the therapeutic alliance scores. The finding is contrary with the findings in the previous literature in child and adolescent psychotherapy, as the predominant research revealed a negative correlation (Abrishami & Warren, 2013; DeVet et al., 2003) or not significant relationship between age and therapeutic alliance (Chu et al., 2014; Halfon et al., 2019). The contradictory results may be discussed in terms of the age range of the population sample in those studies. The studies mostly had both children and adolescent participants in their studies, whereas the current study has the sample of children between 5-12 ages. The studies involving adolescent sample reported that the children under 12 ages had higher therapeutic alliance scores. Therefore, the results of the current study suggest that in the between the ages of 5-12, the children built stronger therapeutic alliance in older children.

Secondly, previous literature supports the finding that girls develop stronger therapeutic alliance than boys over the treatment course (Accurso & Garland, 2015; Langer et al., 2011; Zorzella et al., 2015). The relationship between sex and therapeutic alliance can be discussed under several topics. First of all, studies indicate that girls tend to open up to their friends and seek advice from them more often than boys do. (Gould & Mazzeo, 1982; Lansford & Parker, 1999; Rose, 2002; Zarbatany et al., 2000). Thus, girls may have been tended to express about their inner world such as their feelings, wishes, thoughts and needs to the therapist, more than boys did. Secondly, as nearly all of the therapists were female, there could be a possible effect of same-sex dyads, as the girls were founded to develop therapeutic alliance easier with same-sex therapists as they perceive them more compatible as play partners (Langer et al., 2011; Maccoby, 1990).

4.2. CLINICAL IMPLICATIONS

Findings of the study showed that vocal coordination of the therapist predicts therapeutic alliance through the process of mentalization based child psychotherapy. Furthermore, the effect of nonverbal vocal coordination was discussed that it might be laying the groundwork for the strengthening of the therapeutic alliance between the dyad. The therapist's synchronization of their vocal responses with the child's expressions is a key aspect of nonverbal vocal coordination. Therefore, the therapists should give importance to the nonverbal vocal characteristics they use in the therapy room to help improving the therapeutic alliance.

Effective use of vocalization depends on the nuanced and flexible use of different features, including tempo, pitch, and intensity. The therapist's vocal elements might reflect the child's, they could respond in a harmonious way, or they could build on the child's vocal qualities to amplify them. To exemplify, descriptions and examples of good use of the elements of vocal coordination in the coding system will be explained below in detail.

Firstly, the therapists may vary their tempo to enhance the quality of child's behavior. For instance, therapists can stretch out the final sound of a cheer as the child throws a ball, as it reflects the gradual pace of a ball in motion. While being related to the tempo, rhythm is created by combining moments of silence with the length of a vocalization. Thus, therapists should use their vocal rhythm both for regulating the game's and child's speed. For instance, they can match their vocal rhythm with the rhythm of the child's steps while playing chase game, then they can vary their vocal rhythm to help the child to regulate.

Another domain of the nonverbal vocal qualities includes pitch and melody. In terms of the pitch and melody, the therapists may use diverse and high pitch voice to match with child's intense emotional expression or they may continue to use a low, monotonous voice to help the child regulate, as a tool for synchrony. In addition, by increasing or decreasing the intensity of their voices, therapists should better engage the child's play and reflect their movement characteristics, such as reacting with a louder voice when the child hits an object hard with a toy sword in her hand. Finally, quantity of vocalization is another prominent element in vocal coordination. Long periods of no vocalization by the therapist should be avoided as they may be perceived as a lack of engagement and interest and may cause the child to withdraw. Also, excessive use of vocalization by the therapist should be avoided as it may feel intrusive and create anxiety.

On the other hand, as descriptive characteristics of the exploratory pitch analysis showed several characteristics of the low alliance and high alliance contexts, observing the child's use of vocal quality in terms of their pitch may contribute to the clinical skills of the therapists to understand children better. For example, perceiving the child's voice as being narrow and monotone in their pitch may signal that the child feels safe in the room and open to interact with therapist and deepen the therapeutic material. On the other hand, observing the child's use of high pitch may signal that they might be angry or there is a challenging moment in terms of the therapeutic alliance. For this reason, therapists should also pay attention to the use of vocal pitch in the session in order to better understand the child and the relationship between the dyad.

4.3. LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

There were several limitations in the current study. Firstly, the minutes coded in the nonverbal coordination coding system were limited as only 6 minutes from each session were coded while selecting 3 sessions from the process. Therefore, the in-session time sampling is very limited. Further research may extend the amount of time sampling to collect more data on the nonverbal vocal coordination of the therapists. In addition to that, further studies may also include more measures regarding speech prosody, such as durational patterns and amplitudinal fluctuations. Also, important moments in psychotherapy such as rupture-repair moments can be identified and the nonverbal vocal coordination of those moments can be examined in future studies.

Secondly, the nonverbal coordination coding system is observer based, thus the precision of the coding might be lower than the computer-based analysis. On the other hand, encoding the data with two encoder pairs is a strength in terms of the reliability of the data. In terms of the nature of the coding system, the nonverbal coordination coding system is context dependent and looks at the dyadic relationships and interactions. For this reason, it might be a less precise coding system and maybe we were not able to find fine-tune capacity as we used a 3-point Likert system, as coding the therapist's coordination as satisfactory, good or unsatisfactory.

Moreover, the therapeutic alliance coding system was also observer-based, however the therapeutic alliance scores from the children and therapists might have been used too. Further research might use both observational, participant-report and therapist-report therapeutic alliance scores to have more representative data on alliance.

In terms of the characteristics of the therapists in the study, therapists were in the early stages of their career and the therapist based variation were low. Therefore, further research might have more diverse sampling of the therapists to represent the clinician population better.

Since manual labeling was performed for exploratory analysis of pitch quality and pitch synchrony, the number of sessions used was limited. Thus, it was a pioneering discovery for subsequent studies. Further research may look at the relationship between pitch quality, pitch synchrony and alliance in child psychotherapy with a larger sample set using computer-based calculations. In addition to that, further studies may investigate the possible relationship between children's pitch standard deviation in the sessions and their emotion regulation skills. Lastly, the relationship between pitch synchrony and therapeutic alliance can be further investigated specifically on the rupture-repair moments in child psychotherapy process.

CONCLUSION

The study aimed to examine the relationship between vocal coordination, pitch synchrony and therapeutic alliance in child psychotherapy setting. The study was one of the preliminary studies investigating the relationship in the context of child psychotherapy. The results showed that vocal coordination of the therapist positively predicts the therapeutic alliance between the dyad, while age and sex have also significant effect. Also, the exploratory analysis of pitch characteristics and the analysis of pitch synchrony showed that the dyad tends to have higher pitch synchrony in low alliance setting. Finally, the children had higher mean, variance and range of their pitch in the low alliance sessions.

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APPENDIX A: Clinical Trial Protocol

ClinicalTrials.gov PRS
Protocol Registration and Results System

ClinicalTrials.gov Protocol Registration and Results System (PRS) Receipt
Release Date: September 23, 2023

ClinicalTrials.gov ID: NCT05290714

Study Identification

Unique Protocol ID: MBT-C Trial

Brief Title: The Effectiveness and Change Mechanisms of Mentalization Based Therapy for Children (MBT-C)

Official Title: The Effectiveness and Change Mechanisms of Mentalization Based Therapy for Children (MBT-C)

Secondary IDs:

Study Status

Record Verification: September 2023

Overall Status: Active, not recruiting

Study Start: March 15, 2022 [Actual]

Primary Completion: January 1, 2024 [Anticipated]

Study Completion: February 1, 2025 [Anticipated]

Sponsor/Collaborators

Sponsor: Istanbul Bilgi University

Responsible Party: Principal Investigator
Investigator: Sibel Halfon [shalfon]
Official Title: Assistant Professor
Affiliation: Istanbul Bilgi University

Collaborators: The Scientific and Technological Research Council of Turkey
Anna Freud National Centre for Children and Families

Oversight

U.S. FDA-regulated Drug: No

U.S. FDA-regulated Device: No

U.S. FDA IND/IDE: No

Human Subjects Review: Board Status: Approved
Approval Number: 2021-40024-48
Board Name: Istanbul Bilgi University Committee on Ethics in Research on Human
Board Affiliation: Istanbul Bilgi University
Phone:
Email:

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Address:

Istanbul Bilgi University
Santralistanbul Eski Silahtarağa Elektrik Santrali Kazim Karabekir Cad. No: 2/13

Data Monitoring: No
FDA Regulated Intervention: No

Study Description

Brief Summary: The main aim of the project is to investigate the effectiveness and change mechanisms of Mentalization Based Therapy for Children (MBT-C; Midgley et al., 2017). MBT-C is a transdiagnostic treatment for children aged between 5 to 12 years old with the main aim of increasing mentalization and restoring epistemic trust. Parallel parental work takes place to increase parental mentalization. This project will test the effectiveness of MBT-C in a parallel group single blind pragmatic Randomized Controlled Trial (pRCT) conducted in Turkey in comparison to a parenting and social skills group. The sample will include 220 children between 5-12 years old with internalizing and externalizing and comorbid internalizing/externalizing problems and their parents. During the study, the patients will be randomized to two arms, and the treatment's effectiveness will be investigated both at short (8th and 12th weeks) and long terms (24th and 36th weeks) to also assess relapse prevention. The large sample size and the longitudinal evaluation of primary (decrease in problems), and secondary outcomes will enable the investigation of mediators and moderators.

This project will also undertake a rigorous psychotherapy process study within the RCT, examining for the first time, for which children and under what circumstances MBT-C may be most effective, meaningfully linking process with outcome. For this purpose, patients' baseline characteristics, especially attachment security and mentalization deficits that may interact with treatment outcome (moderators) and different dimensions of mentalization that develop over the course of the treatment (change mechanisms/mediators) will be assessed.

Detailed Description:

Conditions

Conditions: Mental Disorder, Child

Keywords: mentalization
internalizing problems
externalizing problems
comorbid internalizing/externalizing problems

Study Design

Study Type: Interventional
Primary Purpose: Treatment
Study Phase: N/A
Interventional Study Model: Parallel Assignment
Number of Arms: 2

Arms and Interventions

Arms	Assigned Interventions
Experimental: Mentalization Based Treatment for Children (MBT-C) Mentalization Based Therapy for Children (MBT-C) is a transdiagnostic time-limited (12 weekly sessions) and manualized treatment for children aged between 5 to 12 years old with the main aim of increasing mentalization and restoring epistemic trust. Parallel parental work takes place to increase parental mentalization.	Behavioral: Mentalization-Based Treatment for Children (MBT-C) MBT-C will involve 12 paralel individual sessions with the parents and children separately conducted by two different therapists.
Active Comparator: Parenting and Social Skills Group Parenting groups will run for 12 weeks with 10 parents per group. They will involve activities to help parents develop effective parenting skills via working on a family genogram, providing information on child development, developing acceptance and empathy, setting boundaries and anger regulation. The social skills groups will run for 12 weeks and will be conducted with 10 children per group. They will involve activities on self-presentation, peer communication, play skills, empathy and anger management.	Behavioral: Parenting and Social Skills Group Parenting/social skills groups will be co-led by two therapists and involve 12 group therapy sessions with the parents and their children separately (10 parents and children per group).

Outcome Measures

Primary Outcome Measure:

1. Change from Baseline to 36th week on the Child Behavior Checklist (CBCL)
The Child Behavior Checklist (CBCL; Achenbach, 1991) is a widely used method of identifying problematic behaviors in children with two separate versions for ages 1.5–5 and 6–18. The CBCL asks the parents to indicate how true a series of 112 problem behavior items are for their child in the past two months on a 3-point likert scale (0 = "not true", 1= "sometimes true", and 2 = "very true or often true"). Outcomes can be determined for significant problems for Internalizing (e.g., depression, anxiety), Externalizing (e.g., aggression, violence) or Total Problems. The scale has been adapted to Turkish with good reliability and validity (Erol et al., 1995).

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2), 24th week (T3), 36th week (T4)]

Secondary Outcome Measure:

2. Change from Baseline to 36th week on the Me and My Feelings Questionnaire (M&MF)
Me and My Feelings Questionnaire (M&MF; Deighton et al., 2013) is a child-report measure consisting of total short 16-items: 10-items of emotional difficulties scale and 6-items of behavioral difficulties scale. It is scored on a 3-point likert scale (0 = "never expressed", 1 = "sometimes expressed", 2 = "always expressed"). Total score of scales are calculated as the sum of item scores with threshold values 10 for the emotional difficulties and six for the behavioral difficulties. Higher scores of each set of difficulties indicate the probability of mental health problems. The scale has been adapted to Turkish with good reliability and validity (İlnem, 2020).

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2), 24th week (T3), 36th week (T4)]

3. Change from Baseline to 36th week on the Emotion Regulation Checklist (ERC)
Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) is a parent-report measure of children's emotion regulation characteristics and involves 24-items rated on a 5-point likert scale (1 = "never" to 5 = "always"). It taps

into two factors one of which is emotional lability and negativity defined as arousal, anger dysregulation, and mood changes; and the second is emotion regulation defined as socially appropriate emotional displays, empathy, and emotional selfawareness. The scale has been adapted to Turkish with good reliability and validity (Batum & Yagmurlu, 2007).

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2), 24th week (T3), 36th week (T4)]

4. Change from Baseline to 12th week on the Children's Global Assessment Scale (CGAS)
The Children's Global Assessment Scale (CGAS; Schaffer et al., 1983) is a numeric scale (from 1 to 100) used by mental health clinicians to rate the global functioning of children under the age of 18 on a scale of 0 to 100. 90–81 range is scored when there is "good functioning in all areas"; security in family, school, and with peers with only transient difficulties and everyday worries"; 50–41, when there is "moderate degree of interference in functioning in most social areas or severe impairment of functioning in one area"; and 20–11, when there is "need for considerable supervision to prevent hurting others or self or to maintain personal hygiene or gross impairment in all forms of communication". The scale has been adapted to Turkish with good reliability and validity (Gökler et al., 2004).

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2)]

5. Change from Baseline to 36th week on the Parental Stress Index - Short Form (PSI-SF)
Parental Stress Index – Short Form (PSI-SF; Abidin, 1983) is a 36-item parent-report scale.The PSI-SF contains 36 items divided into three subscales, each composed of 12 items: "Parental distress"; "Parent-child dysfunctional interaction"; "Difficult child". Each item is rated on a 5-point likert scale from 1 = "strongly disagree" to 5 = strongly agree". The PSI-SF gives three subscores and a total distress score. The scale has been adapted to Turkish with good reliability and validity (Mert et al., 2008).

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2), 24th week (T3), 36th week (T4)]

6. Change from Baseline to 36th week on the Parent Reflective Functioning Questionnaire (PRF-Q)
Parental Reflective Functioning Questionnaire (PRFQ; Luyten et al. 2017) includes 18 items divided into three subscales that measure PRF. A 7-point likert scale from 1 (strongly disagree) to 7 (strongly agree) is used to score each item. The PRFQ gives three subscales pertaining to "curiosity and interest in mental states", "prementalizing modes" and "certainty about mental states". The scale is in the process of being adapted to Turkish by our research group.

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2), 24th week (T3), 36th week (T4)]

7. Change from Baseline to 36th week on the Difficulties in Emotion Regulation Scale (DERS)
Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is an instrument measuring emotion regulation problems in adults (to be used with parents in the current study). The scale comprises 36 items that are rated on a 5-point likert scale from 1 = "almost never" to 5 = "almost always", with higher scores indicating a difficulty of emotion regulation. The scale produces scores on the following subscales: (a) lack of awareness of emotional responses; (b) lack of clarity of emotional responses; (c) nonacceptance of emotional responses; (d) limited access to effective strategies; (e) difficulties in controlling impulsive behavior when experiencing negative affect; and (f) difficulties in engaging goal directed behavior when experiencing negative affect as well as a total disregulation score. The scale has been adapted to Turkish with good reliability and validity (Yiğit & Güzey-Yiğit, 2017).

[Time Frame: Baseline (T0), 8th week (T1), 12th week (T2), 24th week (T3), 36th week (T4)]

Other Pre-specified Outcome Measures:

8. Screening: Brief Symptom Inventory (BSI)
Parents' initial psychopathology levels will be screened by the Brief Symptom Inventory (BSI; Derogatis, 1992). The BSI is an 53 item self-report scale and assesses three symptom scales, covering nine symptom dimensions: Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation and Psychoticism; and three global indices of distress: Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total. Items are rated on a 5-point likert scale from 1 = "never" to 5 = "a lot". The Turkish adaptation of the scale was conducted by Şahin and Durak (1994).

[Time Frame: Baseline (T0)]

9. Screening: Schedule for Affective Disorders and Schizophrenia for School Aged Children (6-18 Years) (K-SADS-PL DSM-5)
Schedule for Affective Disorders and Schizophrenia for School Aged Children (6-18 Years) (K-SADS-PL DSM 5; Kaufman et al., 2016) is a semi-structured interview that probes child psychiatric disorders according to DSM-5 criteria. If a primary symptom is endorsed, further questions are asked to determine whether diagnostic criteria are met. In

the study, specific components of the instrument will be selected to screen for psychosis, autistic spectrum disorders, substance abuse and dependence, acute risk of harm to self and others. It was adapted to Turkish by Ünal et al. (2019).

[Time Frame: Baseline (T0)]

10. Screening: Kaufman Brief Intelligence Test-Second Edition (KBIT-2)
Kaufman Brief Intelligence Test-Second Edition (KBIT-2, Kaufman & Kaufman, 1990) will be used to screen for general intelligence in children and their parents. The Verbal Scale contains two kinds of items—Verbal Knowledge and Riddles—both of which assess crystallized ability.The Nonverbal Scale includes a Matrices subtest that assesses fluid thinking—the ability to solve new problems by perceiving relationships and completing analogies. The KBIT-2 provides Verbal and Nonverbal Scores, plus a composite IQ. The scale was adapted to Turkish with good reliability and validity (Savasan, 2006).

[Time Frame: Baseline (T0)]

11. Screening: BAPIRT Alcohol and Drug Questionnaire
BAPIRT Alcohol and Drug Questionnaire (Ogel et al., 2017) is a risk-screening questionnaire appropriate for Turkish cultural characteristics in detection of alcohol- and drug-use level through utilization of Addiction Profile Index (API). BAPİRT-alcohol and BAPİRT-drug subscales each involve 6 questions rated on a 3 point likert scale (0 = "none", 1 = "often", 2= "very frequently"). The scale was constructed for use in the Turkish culture by Öğel et al. (2017).

[Time Frame: Baseline (T0)]

12. Baseline Moderator: Adverse Childhood Experiences Scale (ACE)
In order to measure parents' and children's early trauma history, an adapted version of the Adverse Childhood Experiences (ACE) questionnaire (Dube et al., 2003; Murphy et al., 2007) will be used. ACE is a parent-report scale and assesses retrospectively forms of abuse, neglect, and household dysfunction (i.e., witnessing domestic violence, separation and mental illness in the family) both for the parent's and child's early history. Scores range from 0–10 on the ACE, with the latter representing full exposure at some point in the first 18 years of life, to all forms of household dysfunction and abuse detailed in the questionnaire. The scale has been adapted to Turkish by Gunduz et al. (2018).

[Time Frame: Baseline (T0)]

13. Baseline Moderator: Attachment Doll Story Completion Task (ASCT)
An adapted version of the Attachment Doll Story Completion Task (ASCT; Bretherton et al., 1990) will be used to assess the quality and the security of attachment-related representations of children's relationships with their caregivers. ASCT was originally designed for three-year-olds and later adapted to school age children by Granot and Mayseless (2001). ASCT comprises of five storystems that aim to elicit stories from children on attachment-related day-to-day issues. A set of family figure dolls and related props are used to prime children and invite them to complete unfinished stories. Children are classified as secure, fairly secure or insecure based on their responses. The scale was adapted to Turkish by Uluç (2005).

[Time Frame: Baseline (T0)]

14. Baseline Moderator: Kerns Security Scale (KSS)
The Kerns Security Scale (KSS; Kerns et al., 1996) will be used to assess children's baseline attachment security. KSS is a child-report scale and comprises of 15 items measuring (a) the extent to which children believe that their attachment figures are sensitive and available; (b) their tendency to trust attachment figures under stress; and (c) their level of willingness to communicate with attachment figures. Children complete the form separately from both their mother and fathers. The items are rated on a 4-point likert scale "Some kids . . . Other kids. . ." format with higher scores indicating a more secure attachment. The scale was adapted to Turkish by Sümer and Anafarta-Şendağ (2009).

[Time Frame: Baseline (T0)]

15. Baseline Moderator: Experiences in Close Relationships Scale-II (ECR-II)
Experiences in Close Relationships Scale-II (ECR-II; Fraley et al., 2000) will be used to assess the attachment patterns of the parents at baseline. The ECR-II consists of a total of 36 items, 18 in the anxiety and 18 in the avoidance sub-dimensions. The items are answered on a 7-point likert scale (1= "Never Agree", 7= "Strongly Agree"). The scores for each attachment dimension are calculated by taking the average of the item total score. The increase in scores indicates an increase in the anxious or avoidant attachment patterns. The adaptation study of the ECR-II Turkish Form was conducted by Selcuk et al. (2005).

[Time Frame: Baseline (T0)]

16. Baseline Moderator: Child Attachment Interview (CAI)
The Child Attachment Interview (CAI; Target et al. 2003) is a 19-question, semi-structured interview for 8- to 12-year-olds that assesses children's attachment representations of their current relationships with their primary caregivers. CAI coders rate videotapes and verbatim transcripts on 11 9-point scales (e.g., idealization of attachment figures, balance of positive/negative references to attachment figures).

[Time Frame: Baseline (T0)]

17. Experience of Service Questionnaire (ESQ)
The Experience of Service Questionnaire (ESQ, Brown et al., 2014) consists of 12 items rated on a 3-point likert scale (1 = "not true"; 3 = "certainly true") and 3 free text sections looking at what the respondent liked about the service, what they felt needed improving, and any other comments.

[Time Frame: 12th week (T2)]

18. Therapeutic Alliance Scale for Children-revised (TASCr-C, TASCr-T, TASCr-P)
The Therapeutic Alliance Scale for Children-revised (TASC-r, Shirk et al., 2011) will be used as a measure of therapeutic alliance across treatment. The TASC is a 12-item, 4-point Likert-type scale completed by the children and parents and there is a parallel version for the therapist to complete. Each item is rated on a 4 point scale ranging from 1 = "not at all" to 4 = "very much".

[Time Frame: 3rd week (T1) 8th week (T2) 12th week (T3)]

Eligibility

Minimum Age:	5 Years
Maximum Age:	12 Years
Sex:	All
Gender Based:	No
Accepts Healthy Volunteers:	No
Criteria:	Inclusion criteria

1. Child age 5 to 12 years old
2. Clinical levels of child internalizing, externalizing and comorbid internalizing/externalizing problems (clinical levels on CBCL)

Exclusion criteria Children

1. a clinical diagnosis of autistic spectrum disorders (ASD) (meets KSADS-PL threshold criteria)
2. severe intellectual impairment (below 5th percentile on KBIT-2)
3. a clinical diagnosis of psychosis (meets KSADS-PL threshold criteria)
4. severe conduct disorder (clinical range on CBCL DSM-Oriented Conduct Problems scale)
5. severe substance abuse and dependence (meets KSADS-PL threshold criteria)
6. acute risk of harm to self and others (KSADS-PL risk item scores = 3)
7. an emergency/crisis referral, where an immediate response to a significant risk is required

Parents

1. risk of psychotism (clinical on BSI psychotism scale)
2. severe intellectual impairment (below 5th percentile on KBIT-2)
3. severe substance abuse and dependence (positive case on BAPIRIT)
4. acute risk of harm to self and others (BSI item 9, 39 & 40 = 4)
5. an emergency/crisis referral, where an immediate response to a significant risk is required

Contacts/Locations

Central Contact Person: SİBEL HALFON, PhD
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Central Contact Backup:

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Sub-Investigator: BURCU BESIROGLU, MA
Sub-Investigator: PELİNSU BULUT, MA

IPDSharing

Plan to Share IPD: Yes
After publication of the primary objective, published data might be provided to
interested scientists on request for meta-analyses or secondary analyses of
variables of interest in an anonymized way, with permission from the trial team.

Supporting Information:
Study Protocol
Statistical Analysis Plan (SAP)
Informed Consent Form (ICF)

Time Frame:
At the end of the study

Access Criteria:
URL:

References

Citations: Midgley, N., Ensink, K., Lindqvist, K., Malberg, N., & Muller, N. (2017).
Mentalization-based treatment for children: A time-limited approach. American
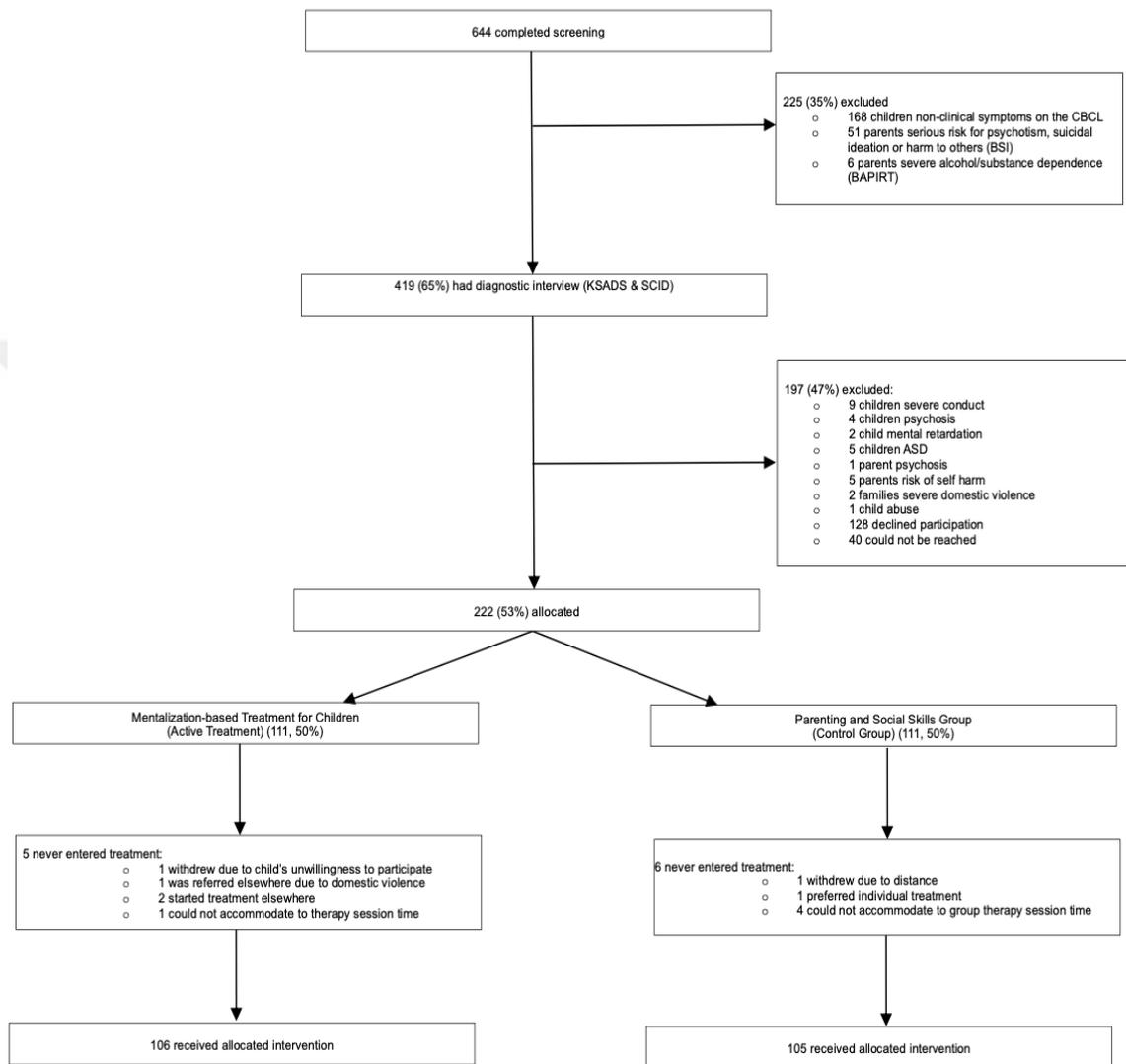Psychological Association. https://doi.org/10.1037/0000028-000

Links:

Available IPD/Information:

APPENDIX B: The CONSORT (Consolidated Standards for Reporting Trials) Flow Diagram

APPENDIX C: Child Behavior Checklist for Ages 1.5-5 (CBCL/1.5-5)

ÇOCUĞUN;
Cinsiyeti: ___ ERKEK ___ KIZ
Yaşı:
Doğum Tarihi: GÜN___AY___YIL_____
Kreşe, anaokuluna gidiyor mu? ___ HAYIR ___EVET (Okulun
adı: _____)

ANNE BABANIN İŞİ (Ayrıntılı bir biçimde yazınız, örneğin emekli,
ilkokul öğretmeni, şoför, oto tamircisi, avukat gibi) EĞİTİMİ (Son
bitirilen okula göre eğitim durumunuz)
BABANIN İŞİ: _____ EĞİTİMİ:
_____ YAŞI: ____
ANNENİN İŞİ: _____ EĞİTİMİ:
_____ YAŞI: ____

FORMU DOLDURAN:
___ Anne
___ Baba
___ Diğer (Çocukla olan ilişkisi:
_____)

Çocuğunuzun davranışlarıyla ilgili bu formu lütfen görüşlerinizi
yansıtacak biçimde yanıtlayınız. Her bir madde ile ilgili bilgi verebilir
ve 2. sayfadaki boşluklara yazabilirsiniz. Lütfen bütün maddeleri
işaretlemeye çalışınız. Teşekkür ederiz.

Aşağıda çocukların özelliklerini tanımlayan bir dizi madde bulunmaktadır. Her bir madde çocuğunuzun **şu andaki ya da son 6 ay** içindeki durumunu belirtmektedir. Bir madde çocuğunuz için **çok ya da sıklıkla doğru ise 2, bazen ya da biraz doğru ise 1, hiç doğru değilse 0** sayılarını yuvarlak içine alınız. Lütfen tüm maddeleri işaretlemeye çalışınız.

0: Doğru değil (Bildiğiniz kadarıyla) 1: Bazen ya da biraz doğru 2: Çok ya da sıklıkla doğru

0 1 2   1. Ağrı ve sızıları vardır (tıbbi nedenleri olmayan).
0 1 2   2. Yaşından daha küçük gibi davranır.
0 1 2   3. Yeni şeyleri denemekten korkar.
0 1 2   4. Başkalarıyla göz göze gelmekten kaçınır.
0 1 2   5. Dikkatini uzun süre toplamakta ya da sürdürmekte güçlük çeker.
0 1 2   6. Yerinde rahat oturamaz, huzursuz ve çok hareketlidir.
0 1 2   7. Eşyalarının yerinin değiştirilmesine katlanamaz.
0 1 2   8. Beklemeye tahammülü yoktur, her şeyin anında olmasını ister.

0: Doğru değil (Bildiğiniz kadarıyla)   1: Bazen ya da biraz doğru   2: Çok ya da sıklıkla doğru

0	1	2	9. Yenmeyecek şeyleri ağzına alıp çiğner.
0	1	2	10. Yetişkinlerin dizinin dibinden ayrılmaz, onlara çok bağımlıdır.
0	1	2	11. Sürekli yardım ister.
0	1	2	12. Kabızdır, kakasını kolay yapamaz (hasta değilken bile).
0	1	2	13. Çok ağlar.
0	1	2	14. Hayvanlara eziyet eder.
0	1	2	15. Karşı gelir.
0	1	2	16. İstekleri anında karşılanmalıdır.
0	1	2	17. Eşyalarına zarar verir.
0	1	2	18. Ailesine ait eşyalara zarar verir.
0	1	2	19. Hasta değilken bile ishal olur, kakası yumuşaktır.
0	1	2	20. Söz dinlemez, kurallara uymaz.
0	1	2	21. Yaşam düzenindeki en ufak bir değişiklikten rahatsız olur.
0	1	2	22. Tek başına uyumak istemez.
0	1	2	23. Kendisiyle konuşulduğunda yanıt vermez.
0	1	2	24. İştahsızdır. (açıklayınız):_____
0	1	2	25. Diğer çocuklarla anlaşamaz.
0	1	2	26. Nasıl eğleneceğini bilmez, büyümüş de küçülmüş gibi davranır.
0	1	2	27. Hatalı davranışından dolayı suçluluk duymaz.
0	1	2	28. Evden dışarı çıkmak istemez.
0	1	2	29. Güçlükle karşılaştığında çabuk vazgeçer.
0	1	2	30. Kolay kıskanır.
0	1	2	31. Yenilip içilmeyecek şeyleri yer ya da içer (kum, kil, kalem, silgi gibi). (açıklayınız):_____
0	1	2	32: Bazı hayvanlardan, ortamlardan ya da yerlerden korkar. (açıklayınız) _____
0	1	2	33. Duyguları kolayca incinir.
0	1	2	34. Çok sık bir yerlerini incitir, başı kazadan kurtulmaz.
0	1	2	35. Çok kavga dövüş eder.
0	1	2	36. Her şeye burnunu sokar.
0	1	2	37. Anne-babasından ayrıldığında çok tedirgin olur.
0	1	2	38. Uykuya dalmakta güçlük çeker.
0	1	2	39. Baş ağrıları vardır (tıbbi nedeni olmayan).
0	1	2	40: Başkalarına vurur.
0	1	2	41. Nefesini tutar.
0	1	2	42. Düşünmeden insanlara ya da hayvanlara zarar verir.
0	1	2	43. Hiçbir nedeni yokken mutsuz görünür.
0	1	2	44. Öfkelidir.
0	1	2	45. Midesi bulanır, kendini hasta hisseder (tıbbi nedeni olmayan).
0	1	2	46. Bir yerleri seyirir, tikleri vardır (açıklayınız): _____
0	1	2	47. Sinirli ve gergindir.
0	1	2	48. Gece kabusları, korkulu rüyalar görür.
0	1	2	49. Aşırı yemek yer.

0: Doğru değil (Bildiğiniz kadarıyla)   1: Bazen ya da biraz doğru   2: Çok ya da sıklıkla doğru

0	1	2	50: Aşırı yorgundur.
0	1	2	51. Hiçbir neden yokken panik yaşar.
0	1	2	52. Kakasını yaparken ağrısı, acısı olur.
0	1	2	53. Fiziksel olarak insanlara saldırır, onlara vurur.
0	1	2	54. Burnunu karıştırır, cildini ya da vücudunun diğer taraflarını yolar. (açıklayınız): _____
0	1	2	55. Cinsel organlarıyla çok fazla oynar.
0	1	2	56. Hareketlerinde tam kontrollü değildir, sakardır.
0	1	2	57. Tıbbi nedeni olmayan, görme bozukluğu dışında göz ile ilgili sorunları vardır. (açıklayınız):_____
0	1	2	58. Cezadan anlamaz, ceza davranışını değiştirmez.
0	1	2	59. Bir uğraş ya da faaliyetten diğerine çabuk geçer.
0	1	2	60. Döküntüleri ya da başka cilt sorunları vardır (tıbbi nedeni olmayan).
0	1	2	61. Yemek yemeyi reddeder.
0	1	2	62. Hareketli, canlı oyunlar oynamayı reddeder.
0	1	2	63. Başını ve bedenini tekrar tekrar sallar.
0	1	2	64. Gece yatağına gitmemek için direnir.
0	1	2	65. Tuvalet eğitimine karşı direnir. (açıklayınız):_____
0	1	2	66. Çok bağırır, çağırır, çığlık atar.
0	1	2	67. Sevgiye, şefkate tepkisiz görünür.
0	1	2	68. Sıkılgan ve utangaçtır.
0	1	2	69. Bencildir, paylaşmaz.
0	1	2	70. İnsanlara karşı çok az sevgi, şefkat gösterir.
0	1	2	71. Çevresindeki şeylere çok az ilgi gösterir.
0	1	2	72. Canının yanmasından, incinmekten pek az korkar.
0	1	2	73. Çekingen ve ürkektir.
0	1	2	74. Gece ve gündüz çocukların çoğundan daha az uyur. (açıklayınız): _____
0	1	2	75. Kakasıyla oynar ve onu etrafa bulaştırır.
0	1	2	76. Konuşma sorunu vardır. (açıklayınız): _____
0	1	2	77. Bir yere boş gözlerle uzun süre bakar ve dalgın görünür.
0	1	2	78. Mide-karın ağrısı ve krampları vardır (tıbbi nedeni olmayan).
0	1	2	79. Üzgünken birden neşeli, neşeli iken birden üzgün olabilir.
0	1	2	80. Yadırganan, tuhaf davranışları vardır. (açıklayınız): _____
0	1	2	81. İnatçı, somurtkan ve rahatsız edicidir.
0	1	2	82. Duyguları değişkendir, bir anı bir anını tutmaz.
0	1	2	83. Çok sık küser, surat asar, somurtur.
0	1	2	84. Uykusunda konuşur, ağlar, bağırır.
0	1	2	85. Öfke nöbetleri vardır, çok çabuk öfkelenir.
0	1	2	86. Temiz, titiz ve düzenlidir.

0 1 2   87. Çok korkak ve kaygılıdır.

0: Doğru değil (Bildiğiniz kadarıyla) 1: Bazen ya da biraz doğru   2: Çok ya da sıklıkla doğru

0 1 2   88. İşbirliği yapmaz.
0 1 2   89. Hareketsiz ve yavaştır, enerjik değildir.
0 1 2   90. Mutsuz, üzgün, çökkün ve keyifsizdir.
0 1 2   91. Çok gürültücüdür.
0 1 2   92. Yeni tanıdığı insanlardan ve durumlardan çok tedirgin olur. (açıklayınız): _____
0 1 2   93. Kusmaları vardır (tıbbi nedeni olmayan).
0 1 2   94. Geceleri sık sık uyanır.
0 1 2   95. Alıp başını gider.
0 1 2   96. Çok ilgi ve dikkat ister.
0 1 2   97. Sızlanır, mızırdanır.
0 1 2   98. İçe kapanıktır, başkalarıyla birlikte olmak istemez.
0 1 2   99. Evhamlıdır.
0 1 2   100. Çocuğunuzun burada değinilmeyen başka sorunu varsa lütfen yazınız:
0 1 2   _____
0 1 2   _____
0 1 2   _____

LÜTFEN TÜM MADDELERİ YANITLAYINIZ.

SİZİ KAYGILANDIRAN MADDELERİN ALTINI ÇİZİNİZ.

APPENDIX D: Child Behavior Checklist for Ages 6-18 (CBCL/6-18)

ÇOCUĞUN;
Cinsiyeti: ___ ERKEK   ___ KIZ
Yaşı:
Doğum Tarihi: GÜN___AY___YIL_____
Kreşe, anaokuluna gidiyor mu?   ___ HAYIR   ___EVET (Okulun
adı: _____)

ANNE BABANIN İŞİ (Ayrıntılı bir biçimde yazınız, örneğin emekli,
ilkokul öğretmeni, şoför, oto tamircisi, avukat gibi) EĞİTİMİ (Son
bitirilen okula göre eğitim durumunuz)
BABANIN   İŞİ: _____   EĞİTİMİ:
_____   YAŞI: ____
ANNENİN   İŞİ: _____   EĞİTİMİ:
_____   YAŞI: ____

FORMU DOLDURAN:
___ Anne
___ Baba
___ Diğer (Çocukla olan ilişkisi:
_____)

Çocuğunuzun davranışlarıyla ilgili bu formu lütfen görüşlerinizi
yansıtacak biçimde yanıtlayınız. Her bir madde ile ilgili bilgi verebilir
ve 2. sayfadaki boşluklara yazabilirsiniz. Lütfen bütün maddeleri
işaretlemeye çalışınız. Teşekkür ederiz.

I. Çocuğunuzun yapmaktan hoşlandığı sporları a, b, c şıklarına yazınız.
Örneğin: Yüzme, futbol, basketbol, voleybol, atletizm, tekvando, jimnastik,
bisiklete binme, güreş, balık tutma gibi.
___ Hiç yok.
Çocuğunuz her birine ne kadar zaman ayırır?

	Normalden az	Normal	Normalden Fazla	Bilmiyorum
a. _____	O	O	O	O
b. _____	O	O	O	O
c. _____	O	O	O	O

Çocuğunuz her birinde ne kadar başarılıdır?

	Normalden az	Normal	Normalden Fazla	Bilmiyorum
a. _____	O	O	O	O
b. _____	O	O	O	O
c. _____	O	O	O	O

II. Çocuğunuzun spor dışındaki ilgi alanlarını, uğraş, oyun ve aktivitelerini a, b, c şıklarına yazınız. Örneğin: Bilgisayar, satranç, araba, akvaryum, el işi, kitap, müzik aleti çalmak, şarkı söylemek, resim yapmak gibi. (Radyo dinlemeyi ya da televizyon izlemeyi katmayınız).

___ Hiç yok.

Çocuğunuz her birine ne kadar zaman ayırır?

	Normalden az	Normal	Normalden Fazla	Bilmiyorum
a. _____	O	O	O	O
b. _____	O	O	O	O
c. _____	O	O	O	O

Çocuğunuz her birinde ne kadar başarılıdır?

	Normalden az	Normal	Normalden Fazla	Bilmiyorum
a. _____	O	O	O	O
b. _____	O	O	O	O
c. _____	O	O	O	O

III. Çocuğunuzun üyesi olduğu kuruluş, kulüp ya da takımları a, b, c şıklarına yazınız. Örneğin: Spor, müzik, izcilik, folklor gibi.

___ Hiç yok.

Çocuğunuz her birinde ne kadar başarılıdır?

	Normalden az	Normal	Normalden Fazla	Bilmiyorum
a. _____	O	O	O	O
b. _____	O	O	O	O
c. _____	O	O	O	O

IV. Çocuğunuzun evde ya da ev dışında yaptığı işleri a, b, c şıklarına yazınız. Örneğin: Gazete alma, bakkala gitme, pazara gitme, bahçe-tarla işleri, hayvancılık, elektrik-su faturası yatırma, çocuk bakımı, sofra kurma-kaldırma, bir dükkanda çalışma gibi. Ödeme yapılan ve yapılmayan her şeyi katınız.

___ Hiç yok.

Çocuğunuz her birinde ne kadar başarılıdır?

	Normalden az	Normal	Normalden Fazla	Bilmiyorum
a. _____	O	O	O	O
b. _____	O	O	O	O
c. _____	O	O	O	O

V. a. Çocuğunuzun yaklaşık olarak kaç yakın arkadaşı vardır? (Kardeşlerini katmayınız).

Hiç yok	1	2 ya da 3	4 ya da fazla
O	O	O	O

b. Çocuğunuz okul dışı zamanlarda haftada kaç kez arkadaşlarıyla birlikte olur? (Kardeşlerini katmayınız).

1'den az	1 ya da 2	3 ya da daha fazla
O	O	O

VI. Yaşıtlarıyla karşılaştırıldığında çocuğunuzun:
a. Kardeşleriyle arası nasıldır?

Kötü	Normal Sayılır	Oldukça İyidir	Kardeşi Yoktur
O	O	O	O

b. Diğer çocuklarla arası nasıldır?

Kötü	Normal Sayılır	Oldukça İyidir	Kardeşi Yoktur
O	O	O	O

c. Size karşı davranışları nasıldır?

Kötü	Normal Sayılır	Oldukça İyidir	Kardeşi Yoktur
O	O	O	O

d. Kendi başına oyun oynaması ve iş yapması nasıldır?

Kötü	Normal Sayılır	Oldukça İyidir	Kardeşi Yoktur
O	O	O	O

VII. 1. Çocuğunuzun okul başarısı nasıldır? Çocuğunuz okula gitmiyorsa lütfen nedenini belirtiniz: _____

	Başarısız	Orta	Başarılı	Çok Başarılı
a. Türkçe / Türk Dili Edebiyatı	O	O	O	O
b. Hayat Bilgisi / Sosyal Bilgiler	O	O	O	O
c. Matematik	O	O	O	O
d. Fen Bilgisi	O	O	O	O

Diğer derslerde nasıldır?
Örneğin: Yabancı dil, bilgisayar. (Beden eğitimi, resim ve müziği katmayınız)

	Başarısız	Orta	Başarılı	Çok Başarılı
e. _____	O	O	O	O
f. _____	O	O	O	O
g. _____	O	O	O	O

2. Çocuğunuz özel alt sınıf ya da bir özel eğitim kurumunda okuyor mu?
O Hayır   O Evet – Ne tür bir sınıf ya da okul? _____

3. Çocuğunuz hiç sınıfta kaldı mı?
O Hayır   O Evet – Kaçıncı sınıfta ve nedeni: _____

4. Çocuğunuzun okulda ders ya da ders dışı sorunları oldu mu?
O Hayır   O Evet – Açıklayınız: _____

Bu sorunlar ne zaman başladı? _____
Sorunlar bitti mi?
O Hayır   O Evet – Ne zaman?_____

Çocuğunuzun herhangi bir bedensel hastalığı ya da zihinsel engeli var mıdır?
O Hayır   O Evet – Açıklayınız: _____

Çocuğunuzun sizi en çok üzen, kaygılandıran ve öfkelendiren özellikleri nelerdir?

Çocuğunuzun en beğendiğiniz özellikleri nelerdir?

Aşağıda çocukların özelliklerini tanımlayan bir dizi madde bulunmaktadır. Her bir madde çocuğunuzun **şu andaki ya da son 6 ay** içindeki durumunu belirtmektedir. Bir madde çocuğunuz için **çok ya da sıklıkla doğru ise 2, bazen ya da biraz doğru ise 1, hiç doğru değilse 0** sayılarını yuvarlak içine alınız. Lütfen tüm maddeleri işaretlemeye çalışınız.

0: Doğru değil (Bildiğiniz kadarıyla) 1: Bazen ya da biraz doğru 2: Çok ya da sıklıkla doğru

0 1 2   1. Yaşından çok çocuksu davranır.
0 1 2   2. Anne babanın izni olmadan içki içer.
0 1 2   3. Çok tartışan bir çocuktur.
0 1 2   4. Başladığı etkinlikleri (oyunu, dersleri, işleri) bitiremez.
0 1 2   5. Hoşlandığı ya da zevk aldığı çok az şey vardır.
0 1 2   6. Kakasını tuvaletten başka yerlere yapar.
0 1 2   7. Bir şeylerle övünür, başkalarına hava atar.
0 1 2   8. Bir konuya odaklanamaz, dikkatini uzun süre toplayamaz.
0 1 2   9. Kafasından atamadığı, onu rahatsız eden bazı düşünceleri vardır (mikrop bulaşma, simetri takıntısı, okul sorunları, bilgisayar gibi) (açıklayınız):_____
0 1 2   10. Yerinde sakince oturamaz, çok hareketli ve huzursuzdur.
0 1 2   11. Gereken gayreti göstermeden, sırtını tamamen büyüklere dayayıp her şeyi onlardan bekler.
0 1 2   12. Yalnızlıktan şikayet eder.
0 1 2   13. Kafası karışık, zihni bulanıktır.
0 1 2   14. Çok ağlar.
0 1 2   15. Hayvanlara eziyet eder.
0 1 2   16. Başkalarına eziyet eder, kötü davranır, kabadayılık eder.
0 1 2   17. Hayal kurar, hayallere dalıp gider.
0 1 2   18. Kendine bilerek zarar verdiği ya da intihar girişiminde bulunduğu olmuştur.
0 1 2   19. Hep dikkat çekmeye çalışır.
0 1 2   20. Eşyalarına zarar verir.
0 1 2   21. Ailesine ya da başkalarına ait eşyalara zarar verir.
0 1 2   22. Evde söz dinlemez.
0 1 2   23. Okulda söz dinlemez.
0 1 2   24. İştahsızdır.
0 1 2   25. Başka çocuklarla geçinemez.
0 1 2   26. Hatalı davranışından dolayı suçluluk duymaz, oralı olmaz, aldırmaz.

0: Doğru değil (Bildiğiniz kadarıyla) 1: Bazen ya da biraz doğru   2: Çok ya da sıklıkla doğru

0 1 2	27. Kolay kıskanır.
0 1 2	28. Ev, okul ya da diğer yerlerde kurallara uymaz, karşı gelir.
0 1 2	29. Bazı hayvanlardan, durumlardan (yüksek yerler) ya da ortamlardan (asansör, karanlık gibi) korkar (okulu katmayınız). (açıklayınız):
	_____
0 1 2	30. Okula gitmekten korkar, okul korkusu vardır.
0 1 2	31. Kötü bir şey düşünebileceği ya da yapabileceğinden korkar.
0 1 2	32. Kusursuz, dört dörtlük ve her konuda başarılı olması gerektiğine inanır.
0 1 2	33. Kimsenin onu sevmediğinden yakınır.
0 1 2	34. Başkalarının ona karşı olduğu, zarar vermeye, ya da açığını yakalamaya çalıştığı hissine kapılır.
0 1 2	35. Kendini değersiz, önemsiz ya da yetersiz hisseder.
0 1 2	36. Bir yerlerini kaza ile sık sık incitir.
0 1 2	37. Çok kavga çıkarır, kavgaya karışır.
0 1 2	38. Çok fazla sataşılır, dalga geçilir.
0 1 2	39. Başı belada olan kişilerle dolaşır.
0 1 2	40: Olmayan sesler ve konuşmalar işitir (açıklayınız):
	_____
0 1 2	41. Düşünmeden hareket eder, aklına eseni yapar.
0 1 2	42. Başkalarıyla birlikte olmaktansa yalnız olmayı tercih eder.
0 1 2	43. Yalan söyler, hile yapar, aldatır.
0 1 2	44. Tırnaklarını yer.
0 1 2	45. Sinirli ve gergindir.
0 1 2	46. Kasları oynar, seğirmeleri ve tikleri vardır (açıklayınız):
	_____
0 1 2	47. Geceleri kabus görür.
0 1 2	48. Başka çocuklar tarafından sevilmez.
0 1 2	49. Kabızlık çeker.
0 1 2	50: Çok korkak ve kaygılıdır.
0 1 2	51. Başı döner, gözleri kararır.
0 1 2	52. Kendini çok suçlu hisseder.
0 1 2	53. Aşırı yer.
0 1 2	54. Sebepsiz yere çok yorgun hissettiği olur.
0 1 2	55. Fazla kiloludur.
	56. Sağlık sorunu olmadığı halde;
0 1 2	a. Ağrı ve sızılardan yakınır (baş ve karın ağrısı dışında)
0 1 2	b. Baş ağrılarından yakınır (şikayet eder)
0 1 2	c. Bulantı, kusma duygusu olur
0 1 2	d. Gözle ilgili şikayetleri olur (Gözlük, lens kullanma dışında) (açıklayınız): _____

0: Doğru değil (Bildiğiniz kadarıyla) 1: Bazen ya da biraz doğru 2: Çok ya da sıklıkla doğru

0 1 2	e.	Döküntü, pullanma ya da başka cilt hastalığı olur
0 1 2	f.	Mide-karın ağrısından şikayet eder
0 1 2	g.	Kusmaları olur
0 1 2	h.	Diğer (açıklayınız): _____
0 1 2	57.	İnsanlara vurur, fiziksel saldırıda bulunur.
0 1 2	58.	Burnunu karıştırır, derisini ya da vücudunu yolar, saç ve kirpiğini koparır. (açıklayınız): _____
0 1 2	59.	Herkesin içinde cinsel organıyla oynar.
0 1 2	60.	Cinsel organıyla çok fazla oynar.
0 1 2	61.	Okul ödevlerini tam ve iyi yapamaz.
0 1 2	62.	El, kol, bacak hareketlerini ayarlamada güçlük çeker, sakardır.
0 1 2	63.	Kendinden büyük çocuklarla vakit geçirmeyi tercih eder.
0 1 2	64.	Kendinden küçüklerle vakit geçirmeyi tercih eder.
0 1 2	65.	Konuşmayı reddeder.
0 1 2	66.	İstemeyerek de olsa, belli bazı davranışları tekrar tekrar yapar (elini defalarca yıkama, kapı kilidini tekrar tekrar kontrol etme gibi) (açıklayınız): _____
0 1 2	67.	Evden kaçar.
0 1 2	68.	Çok bağırır.
0 1 2	69.	Sırlarını kendine saklar, hiç kimseyle paylaşmaz.
0 1 2	70.	Olmayan şeyleri görür. (açıklayınız): _____
0 1 2	71.	Topluluk içinde rahat değildir, başkalarının kendisi hakkında ne düşünecekleri ve ne söyleyecekleriyle ilgili kaygı duyar.
0 1 2	72.	Yangın çıkartır.
0 1 2	73.	Cinsel sorunları vardır. (açıklayınız): _____
0 1 2	74.	Gösteriş meraklısıdır, maskaralık yapar.
0 1 2	75.	Çok utangaç ve çekingendir.
0 1 2	76.	Diğer çocuklardan daha az uyur.
0 1 2	77.	Gece ve/veya gündüz diğer çocuklardan daha çok uyur. (açıklayınız): _____
0 1 2	78.	Dikkati kolayca dağılır.
0 1 2	79.	Konuşma problemi vardır. (açıklayınız): _____
0 1 2	80.	Boş gözlerle bakar.
0 1 2	81.	Evden bir şeyler çalar.
0 1 2	82.	Ev dışındaki başka yerlerden bir şeyler çalar.
0 1 2	83.	İhtiyacı olmadığı halde birçok şey biriktirir. (açıklayınız): ____
0 1 2	84.	Tuhaf, alışılmadık davranışları vardır (eşyaların belli bir düzende ve sırada olmasını isteme gibi). (açıklayınız): _____
0 1 2	85.	Tuhaf, alışılmadık düşünceleri vardır (bazı sayıları, sözcükleri tekrarlama ve bunları zihninden atamama gibi). (açıklayınız): _____
0 1 2	86.	İnatçı ve huysuzdur.

0: Doğru değil (Bildiğiniz kadarıyla)   1: Bazen ya da biraz doğru   2: Çok ya da sıklıkla doğru

0	1	2		87. Ruhsal durumu ya da duyguları çabuk değişir.
0	1	2		88. Çok sık küser.
0	1	2		89. Şüphecidir, kuşku duyar.
0	1	2		90. Küfürlü ve açık saçık konuşur.
0	1	2		91. Kendini öldürmekten söz eder.
0	1	2		92. Uykuda yürür ve konuşur. (açıklayınız): _____
0	1	2		93. Çok konuşur.
0	1	2		94. Başkalarına rahat vermez, onlara sataşır, onlarla çok dalga geçer.
0	1	2		95. Öfke nöbetleri vardır, çabuk öfkelenir.
0	1	2		96. Cinsel konuları fazlaca düşünür.
0	1	2		97. İnsanları tehdit eder.
0	1	2		98. Parmak emer.
0	1	2		99. Sigara içer, tütün çiğner.
0	1	2		100. Uyumakta zorlanır. (açıklayınız): _____
0	1	2		101. Okuldan kaçar, dersini asar.
0	1	2		102. Hareketleri yavaştır, enerjik değildir.
0	1	2		103. Mutsuz, üzgün ve çökkündür (depresyondadır).
0	1	2		104. Çok gürültücüdür.
0	1	2		105. Sağlık sorunu olmadığı halde madde kullanır (içki ve sigarayı katmayınız) (açıklayınız): _____
0	1	2		106. Çevresindeki kişi ve eşyalara kasıtlı olarak zarar verir, zorbalık eder.
0	1	2		107. Gündüz altını ıslatır.
0	1	2		108. Gece yatağını ıslatır.
0	1	2		109. Mızırdanır, sızlanır.
0	1	2		110. Karşı cinsiyetten biri olmayı ister.
0	1	2		111. İçine kapanıktır, başkalarıyla kaynaşmaz.
0	1	2		112. Evhamlıdır, her şeyi dert eder.
				113. Çocuğun yukarıdaki listede belirtilmeyen başka sorunu varsa lütfen yazınız:
0	1	2		_____
0	1	2		_____
0	1	2		_____

APPENDIX E: Psychotherapist's Nonverbal Coordination Coding System

This is an observer rated coding system to evaluate how well therapists are able to coordinate their body movement, facial and vocal expression in a way that appropriately responds to the nonverbal qualities evidenced by the child during session and supports the overall goals of child psychotherapy.

Coding is carried out through trained coders watching videotaped sessions and rating each minute along a number of dimensions. This coding system has a dyadic, interactional focus that is specific to the context of therapy where body/movement coordination is at the service of enhancing regulation, emotional expression, intimacy and expanding symbolic play and verbal reflection. In this coding system coordination is not defined as one-to one matching of actions or movement qualities. Depending on the context, good coordination could be evidenced as joining in, matching, complementing with an opposite quality, marking and modulating or amplifying the dynamic qualities of the child's movements. Therapist's bodily, vocal and facial expressions are coded in relation to child's bodily/nonverbal qualities for each minute on a 3-point Likert scale where a score of 3 indicates 'good coordination', 2 indicates 'satisfactory coordination' and 1 indicates 'poor coordination'. A score of 3 shows that the therapist is exhibiting a skillful, selective and nuanced use of nonverbal elements with flexibility and varied range, and making a contribution to the child's level of regulation, engagement, self-expression, development of the play or reflectiveness etc. A score of 1 on the other hand, indicates that the therapist exhibited poor coordination through most of the minute due to being too rigid, passive, disengaged in his/her nonverbal expressions or mirroring the child too closely in a way that risks being dysregulating. A coding of 2, or "satisfactory coordination," is assigned when the therapist's body is deemed to be mostly coordinated with the child in a way that is good enough to keep the interaction, play, and exploration going. However, no significant contribution is observed from the therapist.

Below is a list of all the 7 subcategories that receive rating and the three combined scores that are based on certain subcategories:

A- *Combined Location and Shape Score*

    1) *Body Location*

    2) *Body Shape*

B- *Combined Movement Dynamics Score*

    3) *Time*

    4) *Weight*

    5) *Space and Gaze*

C- *Combined Face and Vocal Coordination Score*

    6) *Facial Coordination*

    7) *Vocal Coordination*

The 3 combined scores are averaged to calculate the *Total Coordination Score.*

APPENDIX F: Scoring Sheet for the Therapy Process Observational Coding System-Alliance Scale (TPOCS-A)

A. Bağ Alt Ölçeği

Aşağıdaki ölçeği kullanarak, lütfen çocuk ve terapistin bu seanstaki bağlarına dair değerlendirmenizi belirtin. Bu ölçekte bağ, çocuk ile terapistin ilişkisinde ne kadar 1) Olumlu duygulanım (örn. sevmek, anlamak, önemsemek) ve 2) Karşılıklı güven olduğudur. Lütfen aşağıdaki her puanlamayı tüm seansı düşünerek yapın. İlgili numarayı sorunun yanında bırakılan boşluğa yazın.

0	1	2	3	4	5
Hiç			Biraz		Çok

1. Çocuk ne sıklıkta/yoğunlukta terapistin anlayışlı ve destekleyici olduğunu belirtti? ___
2. Çocuk ne sıklıkta/yoğunlukta terapiste düşmanca, eleştirel veya savunmacı bir tutumla davrandı? ___
3. Çocuk ne sıklıkta/yoğunlukta terapiste olumlu duygular ifade etti? ___
4. Çocuk ne sıklıkta deneyimini terapist ile paylaştı? ___
5. Çocuk ne sıklıkta terapist ile etkileşiminde rahatsız görünüyordu? ___
6. Çocuk ve terapist ne sıklıkta birbirleriyle etkileşim halindeyken huzursuz veya rahatsız görünüyorlardı? ___

B. Görev Alt Ölçeği

Aşağıdaki ölçeği kullanarak, lütfen bu seanstaki terapötik görevlere dair değerlendirmenizi belirtin. Bu ölçekte terapötik görev, 1) Terapist tarafından uygulanan terapötik müdahaleler (yorum yapmak, soru sormak, terapötik sınır koymak, vb.) ve 2) Çocuğun terapötik müdahaleleri kullanma ve takip etmeye dair (oyun oynamak, duygu ve düşüncelerini ifade etmek, terapistin söylediğini detaylandırmak, konulan sınıra uymak, vb.) istekliliği. Lütfen aşağıdaki her puanlamayı tüm seansı düşünerek yapın. İlgili numarayı sorunun yanına yazın.

0	1	2	3	4	5
Hiç			Biraz		Çok

7. Çocuk ne sıklıkta/yoğunlukta terapötik görevleri seans dışında, hayatında değişiklik yapmak için kullandı? ___
8. Çocuk ne sıklıkta/yoğunlukta terapötik görevlere uyum göstermedi? ___
9. Çocuk ve terapist ne sıklıkta/yoğunlukta terapötik görevler üzerinde beraber, eşit bir şekilde çalıştılar? ___

ETHICS BOARD APPROVAL

Ethics Board Approval is available in the printed version of this dissertation.