Effectiveness and Feasibility of a Joint Attention (JA)-Based Parent-Mediated Intervention (PMI) for Malaysian Children with Autism Spectrum Disorder (ASD): Cultural Considerations

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Abstract

Background

Social interaction and social cognition models underpinning joint attention (JA)-based parent-mediated interventions (PMIs), advocate family-centred practices and child-directed interactions as current best practices for autism spectrum disorder (ASD) early language intervention. PMIs place emphasis on Speech-language Therapist (SLT)-parents partnership. Parents are coached to become co-therapist by learning and applying a series of interaction and language facilitation strategies, aimed to enhance parent-child interactions and support their children's JA, language, and social communication development. While the effectiveness of PMIs is mainly grounded on evidence from Western and high-resource countries, the effectiveness of PMIs in other cultures is unknown.

Objective

This study aimed to investigate (a) the effects of the Malay-based Hanen More Than Words (M-HMTW), a PMI, on mothers' beliefs in family-centred intervention and practices of mother-child interactions; (b) the effects of the M-HMTW on the following child outcomes, i.e. JA, language, and social communication; and (c) the feasibility of implementing the M-HMTW among the Malay mothers of preschool children with ASD in Malaysia.

Method

Participants included 59 dyads of Malay mothers and their preschool children aged two to five years old with a provisional and/or diagnosis of ASD. 31 dyads were randomly assigned to the M-HMTW group, and 28 dyads were randomly assigned to a treatment-as-usual (TAU) group (i.e. conventional one-to-one therapist-mediated language intervention). The interventions were provided in four months. Mothers' beliefs in family-centred intervention and practices of mother-child interactions were measured through the Parental Beliefs and Practices Questionnaire (Pappas et al., 2008; Simmons & Johnston, 2007). Pre- (T1) and post- (T2) intervention child measures in joint engagement (JE), total vocabulary, and social communication skills were measured via the Joint Engagement Rating Inventory (JERI; Adamson et al., 2016), the Trilingual MacArthur-Bates

Communicative Development Inventories (Trilingual MCDI; Low, 2009), and the Language Use Inventory (LUI; O'Neill, 2009), respectively. The feasibility of the M-HMTW was examined through attrition rates and Gadke et al.'s (2021) ten dimensions of feasibility protocol.

Results

Only 32 dyads ($n_{\text{M-HMTW}} = 14$; $n_{\text{TAU}} = 18$) completed the four months intervention. They were included in the per-protocol and gain scores to analyse the effectiveness of the M-HMTW. The study found only a medium effect of the M-HMTW intervention on mothers' beliefs in family-centred intervention. A lack of intervention effects was found on the gain scores in the practices of mother-child interactions and all child outcomes between the two groups. Within the M-HMTW group, from T1 to T2, the children showed significant increases in their total expressive vocabulary and social communication skills. Within the TAU, the only significant increase observed from T1 to T2 was the children's social communication skills. Following Gadke et al.'s (2021) feasibility protocol, this M-HMTW study showed adequate feasibility in the dimensions of practicality, adaptability, and implementation; partial feasibility in the dimensions of data collection, design procedure, social validity, integration, and effectiveness; and poor feasibility in the dimensions of recruitment capability and generalisability.

Conclusions

This study preliminary shows the impact of the M-HMTW intervention in changing the Malay mothers' beliefs in family-centred intervention. Issues such as attrition rates, assessment time points, and sensitivity of instruments that limited the feasibility of the study were discussed.

Keywords: parent-mediated intervention (PMI), early language intervention, autism spectrum disorder (ASD), effectiveness, feasibility, Malay culture

Preface and Financial Support

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Potential Conflicts of Interest

The author and the research team have no affiliations and conflicts of interest with the participants and institutions where the data were collected.

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Presentations Relevant to Dissertation

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Chee, Z. W., Wong, T. P., Low, H. M., & Mayor, J. (2019, August). *The effects of a parent-mediated early language intervention on the oral language skills of bilingual children with autism spectrum disorder (ASD)*. Paper session presented at the 28th Malaysian English Language Teaching Association International Conference, Kuching, Malaysia.

Chee, Z. W., Wong, T. P., Low, H. M., Mayor, J., Ismail, J., & Mohd Zawawi, N. S. (2019, September). *The cultural influences of an early language parent-mediated intervention (PMI) on children with autism spectrum disorder (ASD) of Malay ethnicity in Malaysia*. Paper session presented at the Special Education International Conference, Putrajaya, Malaysia.

Table of Contents

List of Figures

List of Tables

List of Appendices

List of Abbreviations

APA	American Psychiatric Association
ASD	Autism spectrum disorder
CONSORT	Consolidated Standards of Reporting Trials
CPP	Communication Play Protocol
DIR	Developmental, Individual-difference and Relationship-based
EEG	Electroencephalogram
JA	Joint attention
JE	Joint engagement
JERI	Joint Engagement Rating Inventory
HMTW	Hanen More Than Words
LUI	Language Use Inventory
MCDI	MacArthur-Bates Communicative Development Inventories
M-CHAT	Modified Checklist for Autism in Toddlers
M-HMTW	Malay-based Hanen More Than Words
PMI	Parent-mediated intervention
RCT	Randomised controlled trial
SLT	Speech-language therapist
T1	Pre-intervention
T2	Post-intervention
TAU	Treatment-as-usual
Trilingual MCDI	Trilingual MacArthur-Bates Communicative Development Inventories
UK	United Kingdom
US	United States
WHO	World Health Organisation
WWC	What Works Clearinghouse

ZPD	Zone of Proximal Development

Chapter 1: Introduction

This chapter provides an overview of the dissertation by describing the context and the background of the study. It then highlights the research gap that contributed to the purpose of this study. This chapter first defines autism spectrum disorder (ASD), then discusses its prevalence and the provision of support, and early language interventions for ASD in Malaysia. It continues with an introduction to contemporary intervention approaches and discusses how cultural influences affect interventions for ASD. Finally, this chapter summarises the problem statement and states the research purpose, research questions, and hypotheses of this study.

The Context of the Study

This study intended to investigate the effects of an early language joint attention (JA)-based parent-mediated intervention (PMI) for children with ASD in Malaysia. The study specifically compared pre-intervention (T1) and post-intervention (T2) measures that were related to mothers and their children with ASD. The mother measures were their beliefs in family-centred intervention and practices in mother-child interactions. The child measures were JA, language, and social communication skills. This study focused on the mothers and children from the Malay ethnic group, a dominant culture in the country that constitutes 63.1% of the total Malaysian population (Department of Statistics Malaysia, 2011). Malay families mainly speak Malay as their first language but the majority of families are bilingual or multilingual due to the inevitable exposure to multiple languages in Malaysia (S. H. Chan & Abdullah, 2015; David & Govindasamy, 2003; How et al., 2015).

Definition and Prevalence of ASD

ASD is a type of neurological disorder that is characterised by social communication and interaction impairments as well as restricted interests and repetitive behaviours (American Psychiatric Association [APA], 2013). These characteristics are present from early childhood and they often limit everyday functioning. Studies have indicated that children with ASD exhibit a core deficit of JA (Adamson et al., 2019; Mundy et al., 1986; Paparella et al., 2011). JA is the ability to coordinate attention between a communicative partner and a referent (Mundy, 2016; Mundy et al., 1994). JA

develops in the first year of life and is associated with the development of language, social cognition, and social competencies both in children with typical development (Bakeman & Adamson, 1984; Mundy & Newell, 2007) and ASD (Adamson et al., 2019; Bottema-Beutel, 2016; Mundy, 2016). Deficits in JA can affect early language development (Adamson et al., 2019; Bakeman & Adamson, 1984; Toth et al., 2006) such as vocabulary gain (Tomasello & Farrar, 1986; Tomasello & Todd, 1983). Deficits in JA can also impact on later academic achievement and social competence (Howlin et al., 2000; Venter et al., 1992).

ASD as a diagnosis is acknowledged across many countries regardless of social economic status, race, ethnicity, lifestyle, and parental educational level. Various prevalence rates of ASD have been reported across studies and countries. According to the World Health Organisation (WHO; 2019), the estimated global median prevalence of ASD is one in 160 children (0.62%). The prevalence rates were higher in individual countries, e.g. 1.68% or 1:59 in the US (US Centres for Disease Control and Prevention, 2018) and 1.10% or 1:91 in England (The National Health Service Information Centre England, 2012). In the Asian context, a recent study in China reported that the prevalence rate in Jilin city was similar to rates published in Western countries, around 1.08% or 1:93, (Sun et al., 2019). In Southeast Asia, the published prevalence rates were similar to those reported by the WHO (2019), thus, slightly lower than rates reported in individual Western countries. Singapore reported that one in 150 children (i.e. 0.67%) has ASD (Ng, 2016). Meanwhile, one in 133 children (i.e. 0.75%) aged between 18 and 30 months has ASD in Vietnam (Hoang et al., 2019).

In Malaysia, there is neither a published report nor any local epidemiological study on ASD prevalence in the country (Ministry of Health Malaysia, 2014; Neik et al., 2014). However, according to the Family Health Division of the Ministry of Health Malaysia (2006), a pilot study that utilised the Modified Checklist for Autism in Toddlers (M-CHAT) as the tool for identifying ASD among children aged between 18 and 36 months old, suggested an ASD rate of 1.6 in 1000 children (0.16% or 1:625). The suggested rate was based on a small-scale study in five cities and as such, may not represent the true and current prevalence of ASD in Malaysia.

Although the ASD prevalence rates differ between countries, the comparison might be inconclusive as these reported prevalence rates differ substantially due to factors such as geographic location, date of publication, sample source, and methods. However, studies over the past five decades have indicated a global rise in ASD prevalence rates (WHO, 2018). For example, the prevalence of ASD in the US increased from 1:150 in 2010 to 1:59 in 2014 (US Centres for Disease Control and Prevention, 2018). In Asia, Sun and Allison (2010) also suggested an increase in ASD prevalence, based on their review of prevalence studies in Asia from 1980 to 2008. Based on these emerging rising trends, it is similarly presumed that the ASD prevalence in Malaysia is now higher than the suggested rate that was provided 14 years ago by the Family Health Division of the Ministry of Health Malaysia (2006). Brugha et al. (2011) argued that the escalation might not represent an actual increase in ASD prevalence but due to improved identification (US Centres for Disease Control and Prevention, 2012), broadened diagnostic criteria (Atladóttir et al., 2016), increased advocacy and awareness, funding, and better services allocation for ASD (Ramsey et al., 2016), variation in study methodology, and environmental factors (Herbert, 2010; Landrigan, 2010), or genetic abnormalities (Bailey et al., 1995; Betancur, 2011). The rising prevalence of ASD indicates lifelong implications to many children and adults with ASD and families than was previously expected (Ayres et al., 2018; Rice et al., 2012; Sonido et al., 2020). Besides having to face challenges in social communication and interaction, academic learning and employment (Howlin et al., 2000), children and adults with ASD are also susceptible to co-existing challenges, including intellectual disability (Bishop-Fitzpatrick & Rubenstein, 2019), non-social and social cognitive functioning (Velikonja et al., 2019), social-emotion (i.e. depression, anxiety; Bishop-Fitzpatrick & Rubenstein, 2019; Smith & White, 2020), and physical health (Bishop-Fitzpatrick & Rubenstein, 2019). To address the multiple long-term impacts that individuals with ASD face, there is an urgent need to provide effective interventions to children with ASD as early as possible. While a wide range of intervention options have been documented in the literature, the suitability of these options in the Malaysian context has not been empirically established.

Challenges Faced by Family and Individuals with ASD in Malaysia

While global awareness and resources for early identification of ASD have increased tremendously in the past few decades, the availability of support for intervention in Malaysia has always been criticised of being inadequate for the number of ASD diagnoses made (Ilias et al., 2017; Neik et al., 2014). As the presence of ASD in a family is associated with emotional and economic stress among carers and members of the community (Ilias et al., 2018; Sonido et al., 2020), this stress can be even more detrimental in regions with limited support, such as many rural regions in Malaysia and other Southeast Asia countries (Ilias et al., 2018; WHO, 2017).

Additionally, Neik et al. (2014) revealed gaps in the public's knowledge of ASD in Malaysia. Past local Malaysian studies have revealed that cultural factors such as traditional beliefs and religions may underlie public's misconception of ASD that are commonly found in Southeast Asia countries but less in Western countries (Ilias et al., 2017; Lim, 2015). Examples of cultural influence on ASD understanding include traditional Chinese families who believe that "bad deeds in past lives" cause ASD thus it is a punishment to the child and/or family (Ilias et al., 2017). Parents are Muslim and Christian may link the cause of ASD to their religion and spiritual beliefs, i.e. God's will (Ilias et al., 2017; Jiu & Rungreangkulkij, 2019; Neik et al., 2014). These cultural beliefs of ASD in Malaysia are rooted in family's cultural stigma of ASD across different ethnicities, income groups, and education levels (Lim, 2015). Lim (2015) argued these cultural factors may also influence parents' preferred approaches towards intervention when it comes to addressing the needs of their children with ASD. Families who accept their child as God's view engage in religious practices, such as praying and reading holy books (Ilias et al., 2017). Parents who have a false belief that ASD could be "cured" (Lim, 2015), may rely on lay beliefs (Ilias et al., 2017) and tap into complementary and alternative treatments. Most often, these types of treatment have insufficient or conflicting evidence, have potentially harmful effects (Ministry of Health Malaysia, 2014; Ministry of Health Singapore, 2010), could be waste of time, thus are not recommended for preschool children with ASD.

Parents of children with ASD also commonly complain about insufficient support systems

and resources tailored to the ASD population in Malaysia (Chu et al., 2018; Ilias et al., 2017; Lim, 2015; Low & Zailan, 2018). For instance, these parents face challenges in getting affordable intervention services because of long waiting lists at public hospitals (Chu et al., 2018; Lim, 2015) and high intervention costs at private early intervention settings which are often not subsidised by medical insurance or the Malaysian government (Chu et al., 2018). Additionally, parents often face difficulties in finding a school that meets the needs of their children (Ilias et al., 2017), and in finding teachers or therapists who have experience and knowledge in managing their children's difficulties (Ilias et al., 2017).

As a result of limited support systems and resources, certain parents become resilient as they proactively search for more information and alternative solutions from the internet, books, and seminars to support their children's and their own well-being (Ilias et al., 2017). The active involvement of these parents is in line with recent evidence that suggest PMIs are integral for ameliorating early language and social communication difficulties in children with ASD (Fuller & Kaiser, 2019; Heidlage et al., 2020). However, many online resources that are accessible from Malaysia are those developed in the English language by organisations from countries in the West that have more established support and resources than Malaysia. Although Malaysia is generally a multilingual country, many Malay families may not be proficient enough in English to fully benefit from those freely available online resources. There are limited ASD resources in the Malay language, the first language of many Malay families in Malaysia. Consequently, parents who are not proficient in the English language face language barrier in understanding ASD-related resources that are available online.

Besides the scarcity of linguistically-responsive resources, many existing resources about intervention were originally developed for mainstream cultures in Western industrialised countries. These resources may contain elements or concepts that are potentially biased for local Malaysian families whose cultures are different from the mainstream Western cultures (Joginder Singh et al., 2016; Yong & Wong, 2015). The WHO Southeast Asia Regional Strategy on ASD (2017) outlined

several strategic areas for action, including increasing local empirical studies to guide support provision for children with ASD and developmental disabilities. WHO (2017) promotes early support and resources that are both linguistically and culturally relevant for families of individuals with ASD.

Provision of Early Langauge Intervention for ASD in Malaysia

As ASD is a complex neurological and developmental disorder that is present since toddlerhood, early intervention holds promising potentials for ameliorating the social, behavioural, academic, emotional, and employment challenges that people with ASD often face. Although ASD is not primarily a language disorder (American Psychiatric Association, 2013), children with ASD often require early language intervention to address their speech, language, and social communication challenges. The effectiveness of an early intervention is supported by evidence associated with improvements in receptive vocabulary and language (Roberts & Kaiser, 2011), expressive vocabulary (Adamson et al., 2019; Heidlage et al., 2020; Roberts & Kaiser, 2011), expressive language (Hampton & Kaiser, 2016; Heidlage et al., 2020; Roberts & Kaiser, 2011), and social communication skills (Binns et al., 2019; Fuller & Kaiser, 2019).

Yeo and Lu (2012) indicated that Malaysian parents of children with ASD commonly identified speech and language delays as one of the first red flags in their children's development. As such, it is common for Malaysian parents to approach a speech-language therapist (SLT) first before obtaining a referral to a healthcare professional for an ASD diagnosis. However, there is currently a severe shortage of SLTs in Malaysia (Joginder Singh et al., 2011; Malay Mail, 2016; Ministry of Health Malaysia, 2016). With the ratio of one SLT per population of 156,760 (Ministry of Health Malaysia, 2016), the number of SLTs is significantly lower in Malaysia than the ratios between 1:2,500 and 1:4,700 in the US, United Kingdom (UK), Australia, and Canada (Wylie et al., 2013). Furthermore, in 2015, it was estimated that 104 or 34.7% of the country's SLTs served in public hospitals (Ministry of Health Malaysia, 2016), the only setting that provides intervention at no or very low cost to families in Malaysia. The shortage in manpower has resulted in long waiting lists among families to access these public service providers and long gaps between each speech-language intervention session.

Consequently, children with ASD might be detected or diagnosed at a later age or miss the opportunity to receive optimal speech-language and other interventions at an early age.

Unlike many developed countries, there is a severe lack of SLTs in early intervention and educational settings in Malaysia. Conventionally, speech-language interventions for children with ASD in Malaysia are delivered as outpatient services in private and public hospitals via one-to-one sessions (Joginder Singh et al., 2016). In these settings, the SLTs usually work directly with the children. Joginder Singh et al. (2011) found that Malaysian SLTs tend to conduct assessments and interventions through informal observations of the children's performance in clinical settings as opposed to naturalistic environments at home. Through a questionnaire that was answered by 56 Malaysian SLTs, Joginder Singh et al. (2016) concluded that the duration of the one-to-one intervention sessions varied between 45 and 60 minutes. In private settings, caregivers pay to obtain weekly or fortnightly intervention sessions but families who access services in Malaysian public hospitals are regarded as outpatients and often given intervention once every three to five months (Fadzillah & Lee, 2017). One of the reasons for the great difference in the frequency of intervention between private settings and public hospitals (Joginder Singh et al., 2016) is public hospitals lack financial resources to meet the high demands of early language intervention services for children with language and communication delays. It is therefore proposed that local SLTs include other models of intervention in their practices as alternatives to the current one-to-one intervention (Joginder Singh et al., 2016; Yong & Wong, 2015).

Intervention models such as PMIs (Sokmum et al., 2017; Yong & Wong, 2015) and child-centred interactions (Yong & Wong, 2015) have been suggested to bridge the service delivery gap in early language interventions for children with ASD in Malaysia, particularly in settings such as public hospitals, where SLTs cannot cope with the demands of their local communities. This suggestion to provide PMIs in early intervention in hospital settings is in line with the Malaysian ASD Clinical Practice Guidelines (Ministry of Health Malaysia, 2015) and WHO (2017)'s recommendation of including parents in their children's education and support provision.

Existing early interventions such as the Developmental, Individual-difference and Relationship-based (DIR) Floortime (Greenspan, 1992; Greenspan & Wieder, 1999, 2006), the Son-Rise Programme (Kaufman, 1994), and the Hanen More Than Words Programme (HMTW; Sussman, 1999; Sussman et al., 2016) are largely based on parent-mediated and child-centred practices. These PMIs are based on the philosophy of family-centred practices or working together with families by honouring and respecting their values and choices (Trivette et al., 2010; Van Kleeck, 1994). As JA is a common deficit among children with ASD, it is often included as a primary goal in ASD interventions. In JA-based PMIs, parents are trained to be child-centred and to use interaction and language facilitation strategies (Sussman et al., 2016) that are contingently responsive to their children's behaviours and language production (Girolametto & Weitzman, 2006; Killmeyer & Kaczmarek, 2017). These strategies include follow their children's lead (Eyberg & Robinson, 1982), join in and respond to their children's current focus of attention (Akhtar et al., 1991), and expand on back-and-forth communication with their children. Incorporating JA in the intervention also promotes the quality of parent-child relationships (Adamson et al., 2019; Schertz & Odom, 2004). When parents become child-centred, they are able to establish JA with their children easily and simultaneously provide rich language input to facilitate their children's language development (Adamson et al., 2019; Tomasello & Farrar, 1986), thereby maximising opportunities to engage with their children in naturalistic environments.

The practices of JA-based PMIs and child-centred approaches are not new to Malaysian SLTs (Yong & Wong, 2015). In the last decade, SLTs in Malaysia have access to training in conducting PMIs for parents of children with ASD, particularly, the Hanen's More Than Word (HMTW) programme. Although there is a growing number of certified SLTs in the HMTW (Sokmum et al., 2017), empirical evidence about its effectiveness within this multilingual and multicultural nation has yet to be established.

Problem Statement

Evidence from intervention studies for children with language disorder or ASD that are PMI-based predominantly are based on Western middle- and upper-class families (Oono et al., 2013; Roberts et al., 2019; Van Kleeck, 1994) but still strongly influence current fundamental practices of language intervention in many countries including those with low resources to support people with ASD (Hwa-Froelich & Vigil, 2004; Joginder Singh et al., 2011). However, early language intervention is intertwined with not just the child's development but cultural practices. Evidence to support the effectiveness of PMIs in non-Western contexts is limited. In Malaysia, PMIs such as HMTW were introduced in the recent decade (Sokmum et al., 2017), mainly delivered in the English language and conducted according to protocols originally developed for Western families. As evidence supporting the effectiveness of PMIs in the Malaysian context is scarce, a study on the effectiveness of the PMIs on not just the developmental but also the cultural measures in a non-Western context is warranted.

Research Purposes

This study aimed to investigate the effectiveness of a PMI, specifically the HMTW, with mothers and their children with ASD, from the Malay cultural heritage, in Malaysia. Specifically, the intervention effects were compared between the target intervention, i.e. a Malay-based Hanen More Than Words (M-HMTW) group; and a conventional one-to-one therapist-mediated language intervention provided by the Malaysian public hospitals, i.e. treatment-as-usual (TAU). To achieve this aim, the research examined whether there were differences in their mothers' beliefs in family-centred intervention and practices of mother-child interactions following the intervention. The study also aimed to examine the changes in JA, language, and social communication skills of children with ASD after the completion of their respective types of intervention. Lastly, the study aimed to investigate the feasibility of implementing the target intervention, M-HMTW, in Malaysia. The findings would provide evidence for the impact of JA and PMI on Malaysian families as well as insights to understand how synchronised the Malaysian parents are with the principles of PMIs.

Research Questions and Hypotheses

Based on the research purposes, three research questions and hypotheses were formulated:

1. Are there any differences in the mothers' beliefs in family-centred intervention and practices of mother-child interactions between mothers who completed the M-HMTW intervention and the TAU intervention?

   H_1: Mothers from the M-HMTW would improve more in beliefs in family-centred intervention and practices of mother-child interactions than mothers who completed the TAU intervention.

2. Are there any differences in the children's JA, language, and social communication skills between children who completed the M-HMTW intervention and the TAU intervention?

   H_1: Children from the M-HMTW would improve more in JA, language, and social communication skills than children who completed the TAU intervention.

3. What is the feasibility of the M-HMTW implementation among the Malay mothers of children with ASD in Malaysia?

Structure of this Dissertation

The next chapter provides a literature review of the key areas of this study. Chapter 3 offers a detailed description of the methodology employed to answer the research questions delineated above. Chapter 4 presents the findings based on the intervention variables measured. Chapter 5 provides a discussion of the findings in relation to the research questions raised and relevant literature. Conclusions of the study with implications for early language intervention for ASD in Malaysia are presented in Chapter 6.

Chapter 2: Literature Review

This chapter aims to present a review of the literature relevant to this study. It first discusses the definition of JA, the development of JA and language in both children with typical development and with ASD. This chapter then discusses the theories underpinning the development of JA. This is followed by the fundamental of JA-based PMIs and an examination of intervention effects that focus on PMIs for children with ASD. The final section of this chapter examines the cultural influences on JA-based PMIs.

Definition of JA

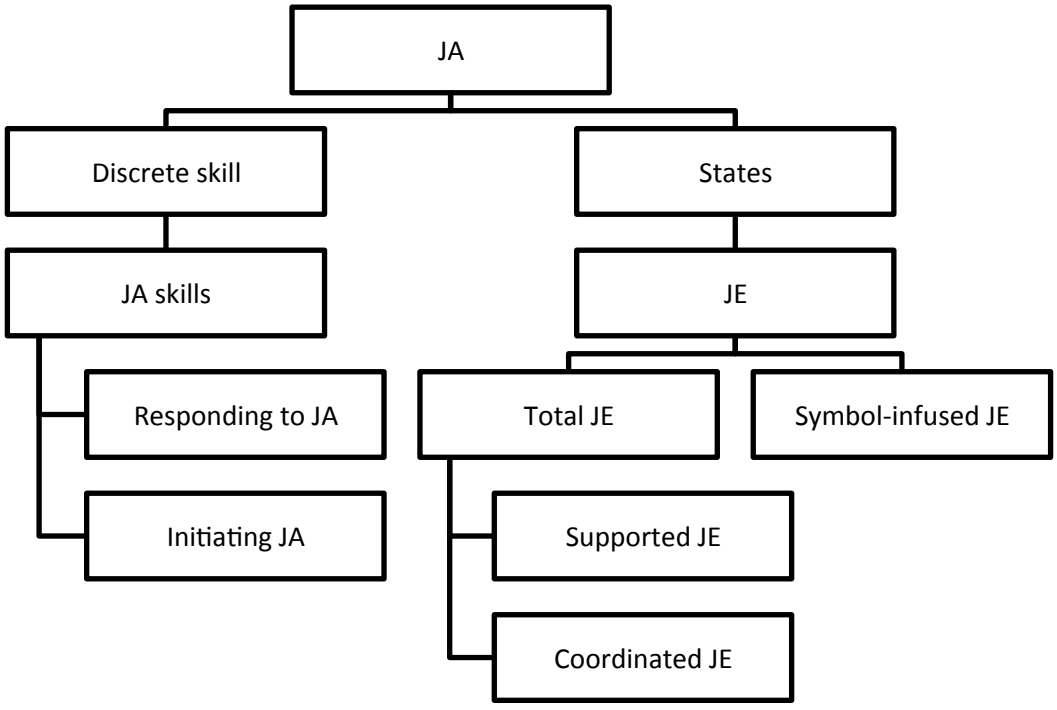
JA has been defined and conceptualised differently in the literature. There are two commonly known JA constructs: (a) JA skills and (b) joint engagement (Figure 2.1). The first construct, JA skills, describe JA as a set of discrete skills that involves the use of communication acts such as pointing, showing, and looking, to direct others' attention to a shared moment or a referent point (Bottema-Beutel, 2016; Mundy, 2016). The referent point can be an object, people, or event. There are two types of JA skills: (a) responding to JA and (b) initiating JA. Responding to JA refers to how an individual responds to others' communication bids (Bottema-Beutel, 2016). Specifically, Mundy (2018) defines responding to JA as an ability to use communication acts such as gazes and gestures to follow the direction of others' attention. On the other hand, initiating JA is a communication act that "starts" an interaction with a partner (Bottema-Beutel, 2016). Initiating JA involves spontaneity in directing others' attention to an object or event of interest (Mundy, 2018). In the early development, infants use gestures and eye alternation to get others' attention or to direct others' attention to objects, events, and/or themselves (Mundy & Newell, 2007).

The second construct of JA is joint engagement (JE). JE refers to a child's flow of attention when both the child and parent are attending to the same referent over a period of back-and-forth interactions (Adamson et al., 2016; Patterson et al., 2014). Under the JE construct, Adamson et al. (2016) proposed a state-based coding system, namely the Joint Engagement Rating Inventory (JERI) to describe children's JE. Adamson et al.'s (2016) JERI coding system comprises four types of JE: (a)

total JE, (b) supported JE, (c) coordinated JE, and (d) symbol-infused JE. Total JE is the sum of time a child is involved in supported JE and coordinated JE. In supported JE, the child engages with the parent, with the parent's support. During supported JE, the child shares the same referent with the parent but the child does not independently switch engagement from the referent to the parent's gaze, and vice-versa, from the parent's gaze to the referent. However, in coordinated JE, the child is able to independently and actively alternate attention between the referent and the parent. Supported JE and coordinated JE can be non-symbol-infused or symbol-infused. In symbol-infused JE, the child attends and understands symbolic content, and produce symbolic acts such as language.

Figure 2.1

The Two Constructs of Joint Attention (JA), JA skills, and Joint Engagement (JE)



In this dissertation, JA was measured using Adamson et al.'s (2016) construct of supported JE and coordinated JE. Unlike discrete JA skills which are often measured as the frequency of occurrences, Adamson et al.'s (2016) JE is characterised by a state attention for at least three

seconds, and excludes any fleeting glance to the parent, a quick point to or a glance at an object, and object engagement only behaviour (Adamson et al., 2016).

JA and Language Development in Children with Typical Development

The development of JA begins in the first year of life. Newborns typically look briefly at people, objects, or events in their social environment (Adamson & Chance, 1998; Trevarthen & Aitken, 2001) but from the second month onwards, they engage with parents through face-to-face interaction or person engagement. These back-and-forth dyadic interactions between infants and their parents create the foundation for attention and affect sharing with others (Adamson & Chance, 1998; Trevarthen & Aitken, 2001). Concurrently, through trial and error parents learn to pacify their infants' needs and attach meaning to the unintentional communication that infants expressed through non-referential sounds and gestures. The stage of unintentional communication where infants rely on non-referential sounds and gestures, is also known as the prelocutionary stage (Bates, 1979). Through continuous face-to-face interactions, infants learn to value and participate in interpersonal relationships, sustain longer attention, and intentionally exchange facial expressions and affects with parents. At this stage, infants are still fully dependant on parents to support the initial sharing of interests and to exchange communicative turns with them.

When infants are approximately six months old, their interests shift from face-to-face interaction to object engagement, and they begin to explore and manipulate objects. At this stage, infants still continue to engage with people around them but at a reduced rate as they tend to focus on objects in their environments (Adamson & Chance, 1998; Trevarthen & Hubley, 1978). They are proficient at paying attention to either their parents or an object at any one time but not in shifting attention from their parents to the object or vice-versa (Sussman et al., 2016). Parents' continued engagement with their infants' referent of interest leads their infants to the state of supported JE (Adamson et al., 2016; Adamson & Chance, 1998). In supported JE, infants focus almost exclusively at a referent and might not actively acknowledge their parents' involvement (Adamson et al., 2016) or pay attention to their parents explicitly through visual referencing (Adamson et al., 2004). The

engagement between infants and parents in supported JE is not through the eye contact but through a mutual interest in the referent (Bottema-Beutel et al., 2014).

As unintentional communication shifts to intentional, infants move to the illocutionary stage (Bates, 1979). This marks the emergence of coordinated JE where infants learn how to coordinate their interactive attention between their parents and a referent (Bakeman & Adamson, 1984). Both supported JE and coordinated JE can be observed from typically developing infants from the age of six months old onwards (Adamson & Chance, 1998; Bakeman & Adamson, 1984). In the beginning, supported JE is dominant while coordinated JE might be brief and not observable in every communicative context. Unlike supported JE, in coordinated JE, infants are able to actively attend to both parents and the referent, and sustain a shared interest while maintaining back-and-forth interactions with their parents (Adamson et al., 2004). They shift their eye gazes between their parents and the referent within an extended duration (Adamson et al., 2016; Bakeman & Adamson, 1984). By 18 months, coordinated JE is consolidated in typically developing children although they still continue to use supported JE for social communication purposes and learning.

Just like supported JE and coordinated JE, symbol-infused JE is also facilitated by continuous adult-child interactive exchanges. The interactions facilitate children's understanding of cultural symbols which include the conventions of language and social communication used by the family. When parents use symbols such as gestures, pretend play, or language in the interactions, they invite their children to focus on the same referent. By paying attention to symbols and associating symbols to referents, symbol-infused JE develops (Adamson & Bakeman, 2016). The shared attention provides a cultural context for children to match symbols to external referents (Adamson et al., 2004). For instance, children learn early words when their parents point to an object and label the word repeatedly in their daily routines. Eventually, children learn to attend to the language used in their cultural context, understand its meaning, and use the language to communicate with their parents. Children continue to use all forms of JE and language fluently and integrate them in daily interactions according to the demands of the communication contexts (Hahn et al., 2016).

JA and Language Development in Children with ASD

JA has been established as a skillset that children with ASD lack (Adamson et al., 2019; Mundy, 2018; Mundy & Sigman, 1989). Deficits in JA, one of the earliest signs of ASD (Werner & Dawson, 2005) can differentiate ASD from typically developing infants (Mundy, 2018; Mundy & Newell, 2007) and toddlers (Adamson et al., 2019; Bottema-Beutel, 2016). By two years old, toddlers with typical development would have mastered their JA skills and JEs, but children with ASD or at risk of ASD generally have pervasive JA difficulties (Adamson et al., 2019). Adamson et al.'s (2019) recent longitudinal empirical study found that 24-month-old toddlers with ASD or at risk for ASD have significantly lower mean scores in responding to JA, initiating JA, supported JE, coordinated JE, and symbol-infused JE when compared to typically developing toddlers of similar age and background.

Bottema-Beutel (2016) postulated that the presence of a JA threshold or an optimal level of JA is needed for children require to kick-start their development of language. Since the early development of JA is intertwined with language acquisition, studies have suggested that JA is more tightly associated with language development in children with ASD than in children with typical development (Adamson et al., 2009, 2019; Bottema-Beutel, 2016). Specifically, in Bottema-Beutel's (2016) meta-regression analysis, it was found that children with ASD show greater effect sizes in the association between their receptive and expressive language, and JE than children without ASD. Bottema-Beutel's findings were further expanded by Adamson et al. (2019) who found that at 24-month-old, toddlers with ASD or at-risk for ASD ability in responding to JA and JEs significantly predicted later expressive vocabulary at 31 months. It was also found that supported JE, coordinated JE, and symbol-infused JE were significantly low in toddlers who were non-verbal but these JE skills could be distinctly developed once the toddlers started to talk.

Children with ASD who have persistent fleeting engagement (Adamson et al., 2001) spend more time in object engagement and less time in JE with their parents (Adamson et al., 2009). Adamson et al. (2009) found that 30-month-old toddlers with ASD, who have a persistent deficit in

coordinated JE can still develop their supported JE and language skills at a slow pace that is comparable to 18-month-old toddlers with typical development. Due to their deficits in JA, children with ASD often have difficulties alternating their attention between an object and their communicative partner, and therefore appear as unresponsive to their parents. When parents try to interact with these children, their children's unresponsiveness might be perceived as a rejection of social interaction (Adamson et al., 2001). These children may be left alone more often and spend lesser time interacting or playing with people in comparison to those who are responsive to interactional bids. As time spent in JE with parents predicts early use of communication skills (Carpenter et al., 1998), deficits in JA would have negatively influenced subsequent language and social communication development in these children (Adamson et al., 2009; Bakeman & Adamson, 1984; Bottema-Beutel et al., 2014).

The impact of a deviation in the JA development trajectory on later language development has also been shown in brain studies. In an electroencephalogram (EEG) coherence study, Kühn-Popp, Kristen, Paulus, Meinhardt, and Sodian (2016) found that 14-month-olds infants' frontal-central EEG coherence in the left hemisphere (i.e. brain connectivity in the left hemisphere that links to language function) is associated with declarative pointing, an initiating JA at 15 months old, and predicts the use of vocabulary that describes the mental status such as thinking, wishing, knowing, guessing, and believing in typically developing children at 48 months old.

In summary, research suggests that the development of JA in children with ASD is related to language development. However, the developmental patterns of JA in children with ASD do not necessarily follow the developmental sequence in typically developing children (Adamson et al., 2019; Bottema-Beutel, 2016). Although children with ASD may share the same core deficit of JA, their levels of deficits may differ, thus language difficulties in these children vary from one child to another (Baker-Ericzén et al., 2007; Pickles et al., 2014). Additionally, the influence of potential comorbidities such as intellectual impairment, language impairment, and/or catatonia (APA, 2013) make the children's language ability even more heterogeneous. The heterogeneous development is

evident between aged two and six years old (Pickles et al., 2014). After the age of six years old, Pickles et al. (2014) found that their language development patterns become less heterogeneous and more similar to each other. However, only a small proportion of children with ASD catch-up or partially catch-up with their delay by age six and later attain typical adult language outcomes. Therefore, JA difficulties, if not ameliorated, can widen the gap in language deficits when these children grow older.

Theories Underpinning the Development of JA

An understanding of how JA is positioned alongside other developmental domains (Schertz & Odom, 2004) provides insights for ASD intervention. JA has been conceptualised by different theories (Schertz & Odom, 2004). This section examines two main theories that underpin the development of JA: (a) social interaction and (b) social cognition.

Social Interaction Model

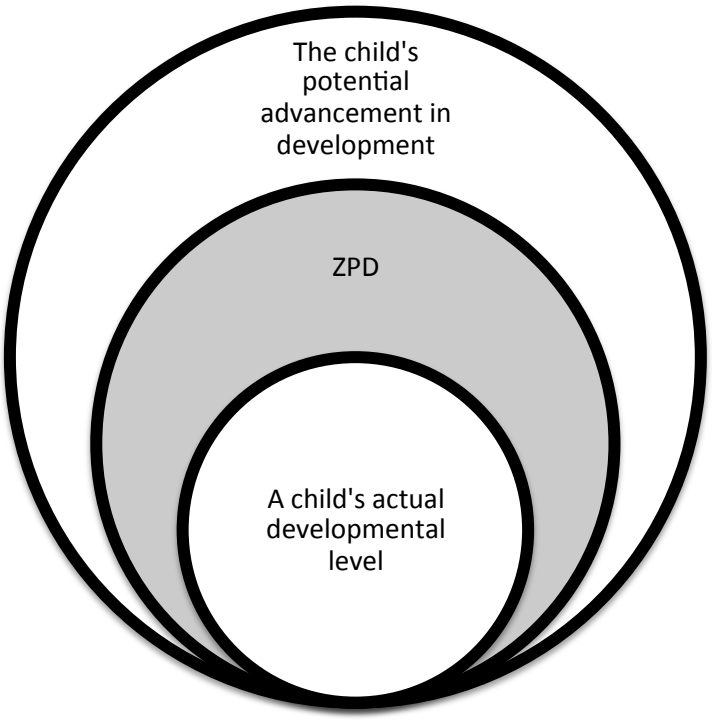
According to the social interaction model, learning and development are interrelated (Vygotsky, 1978) and are rooted in one's society and culture (Vygotsky, 1979). Learning takes place when a concept is introduced to children through social interaction with the people and the environment within their culture (Vygotsky, 1978, 1986). The environment is multi-layered and encompasses elements that surround children such as family, school, neighbours, community, and religion. Interactions between children and environmental influences are dynamic (Bronfenbrenner, 1979). Through shared attention in social interaction, children actively participate in their environment (Bronfenbrenner, 1979; Shatz, 1982; Snow, 1979) to learn and use language according to the cultural conventions used by people in their environment (Vygotsky, 1978, 1986).

According to Vygotsky (1978), learning is most likely to occur within each child's zone of proximal development (ZPD). The ZPD is defined as the distance between a child's actual developmental level, i.e. what a child can achieve independently; and potential advancement in development, i.e. what the child can achieve under a parent's guidance or in collaboration with a more capable peer (Figure 2.2). Parents scaffold children's JA development by enticing their

children's attention to form a shared referent with them through strategies such as shaking an object, pairing their gestures and body language with language, using exclamatory facial expression and speech, and more. Bakeman and Adamson (1984) showed that the scaffolding of JA is only observable in parent-infant interactions but not in infant-infant interactions. This observation acknowledges the role of parents in scaffolding their children's learning.

Figure 2.2.

Zone of Proximal Development (ZPD; Vygotsky, 1978)



Social interaction with a more knowledgeable and competent partner, such as parents mediates the type of language, social communication, cultural values, beliefs, and problem-solving skills that a child acquires. Thus, parents serve as the agents of change as they guide and influence their children's developmental learning processes (Bronfenbrenner, 1979; Bruner, 1977, 1983; Snow, 2017). Building on their culture-specific beliefs, parents may naturally employ an adult-centred or a child-centred approach to obtain their children's responses towards their JA bids during daily parent-child interactions. After gaining their children's JA, parents use language, culture-specific toys, games,

or books to interact with their children while they embed their cultural values, beliefs into the interactions. The children subsequently learn their family's language, how to play and engage with their physical environment, and eventually how to interact and use language in their culturally acceptable ways.

Social Cognitive Model

Social cognition includes any cognitive ability and process that involves social interaction. The social cognitive model posits that JA is a pivotal skill for other developmental skills, such as language, social communication, and theory of mind (Mundy, 2018). Mundy (2018) asserted that JA is an underlying mental aspect of "intentionality" when sharing attention with others (Bakeman & Adamson, 1984; Carpenter et al., 1998), and when understanding, and following others' intention (Carpenter et al., 1998; Landa et al., 2007). The intentionality aspect of JA is the foundation to develop other skills through social-interaction and imitation of others.

Mundy (2018) also claimed that the neural system of JA is widely distributed across the brain. Several cross-sectional neuroscience research studies confirmed that the neurodevelopment of JA involves a number of primary collective brain tissues, namely nodes in the human brain. These primary nodes are located at the (a) dorsal and medial frontal cortex, (b) orbital frontal/insula cortex, (c) anterior/posterior cingulate cortex, (d) superior temporal cortex, (e) precuneus/parietal cortex, and (f) amygdala and striatum (Caruana et al., 2014; Eggebrecht et al., 2017; Elison et al., 2013; Mundy et al., 2003; Oberwelland et al., 2016; Schilbach et al., 2010). Disturbance in the interactions between the neural systems and the organisation of social inputs for processing communication and interaction cause deficits in the neurodevelopment of JA (Mundy, 2018). Deficits in JA development simultaneously disrupt the development of language, social communication, conversational skills (Adamson et al., 2014), and childhood social-cognitive mentalising (Mundy, 2018; Mundy & Sigman, 1989).

In summary, social interaction and social cognitive models underpin the development of JA. The social interactive model emphasises that children learn within their ZPD through active

interaction with people and the environment while the social cognitive model emphasises JA as a pivotal skill. Due to deficits in JA, and the critical relationship between JA and children's development, current best practices for ASD early interventions regard parents as competent interactional partners for their children, and actively involve parents as mediators of their children's learning to address deficits in JA and other associated developmental challenges such as language, and social communication (Eggebrecht et al., 2017). The section below discusses the fundamentals of JA-based parent-mediated interventions (PMIs).

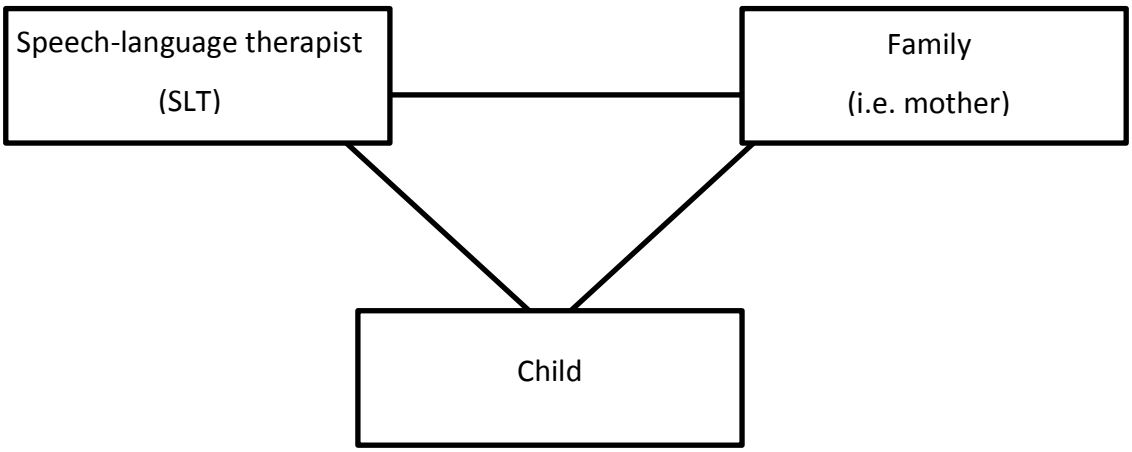
The Fundamental of JA-Based PMIs

PMIs are based on the social interaction model and philosophy of family-centred practices. Unlike traditional one-to-one therapist-mediated interventions which mainly focus on the SLT-child relationship, PMIs have a centre heavily on the shared relationships among the SLT, family, and child (Brown & Woods, 2016). As shown in Figure 2.3, PMIs regard parents as crucial in the dynamic exchange between children and their environment (Bronfenbrenner, 1979; Vygotsky, 1978). In PMIs, parents are viewed as equal partners. SLTs and intervention team members work collaboratively with parents during the process of assessing, determining goals, conducting intervention (Oono et al., 2013), and monitoring progress (Murray et al., 1990; Snow, 2017). Through this collaboration, parents learn to become co-therapists by modifying their interactive behaviours with their children, thereby maximising their children's learning within the family environment.

PMIs help parents enhance the quality and effectiveness of their interaction with their children. SLTs typically take the role of educator, and coach parents to use different interaction and language facilitation strategies that optimally support children's development (Charlop et al., 2018; Sussman, 1999; Sussman et al., 2016; US National Research Council, 2001). These key strategies are drawn from effective responsive interaction (Girolametto & Weitzman, 2006; Killmeyer & Kaczmarek, 2017) and child-directed speech (Snow, 1986), that fine-tune children's learning within their ZPD (Vygotsky, 1978).

Figure 2.3

The Speech-language Therapist (SLT), Family and Child Relationship in Parent-Mediated Interventions (PMIs)



Responsive interaction is when parents follow their children's interest, and match their responses to their children's preceding JA or utterances semantically and linguistically (Girolametto & Weitzman, 2006; Weitzman et al., 2017). The *responsivity hypothesis* (Girolametto & Weitzman, 2006), derived from the social-interactionist perspective posits that responsive interaction allow children to focus on language learning (Rocissano & Yatchmink, 1983), particularly in the area of vocabulary, syntax, and communication skills (Bohannon & Bonvillian, 1997). Examples of responsive interaction strategies are observe, wait and listen, follow children's lead, and take one turn at a time. Child-directed speech is usually characterised as simple, short, repetitive, and slow in tempo (Snow, 1986). Additionally, language input from responsive interactions is easy to process because parents align with their children's focus of attention or communication intent (Akhtar et al., 1991; Tomasello & Farrar, 1986), thus, providing a meaningful interpretation of the interaction and rich language experience to their children (Weisleder & Fernald, 2013). Girolametto and Weitzman (2006) also proposed a *structural hypothesis* that complements their *responsivity hypothesis*. They believed that parents could scaffold and increase the complexity of their own language input to keep up with their

children's language ZPD by providing child-directed speech or language modeling that is grammatically one step ahead of their children. Scaffolding is a dynamic process of adjusting the level and complexity of child-directed speech, parents fine-tune themselves to correspond to the continuous growth in their children's comprehension and/or production level (Snow, 1986). Examples of child-directed speech strategies are imitate, interprete child's message, and expand child's utterances. Both responsive interaction and child-directed speech strategies have been found to increase JA, language, and communication development among children with language delay as well as children with ASD (Perryman et al., 2013).

Effectiveness of PMIs for Children with ASD

There is growing evidence on the effectiveness (Kasari et al., 2015) and attributions (Oono et al., 2013) of PMIs for children with ASD. The US National Research Council (2001) recommended that children with ASD receive at least 25 hours of intervention per week. Patterson (2010) argued that such intensive intervention might not be feasible through the typical one-to-one intervention sessions but achievable when parents integrate intervention goals into their children's naturalistic environments. Researchers suggest that PMIs can have positive impacts on children's JA bids (Rocha et al., 2007), language (Nevill et al., 2018; Williams, 2016), and communication (Nevill et al., 2018) development in children with ASD, thus enhancing the quality of parent-child interactions (McConachie & Diggle, 2007; Oono et al., 2013).

In the long run, PMIs can be cost-effective as it reduces parents' dependence on therapists. Indirectly, PMIs help to overcome the issues of infrequent intervention sessions, a severe shortage of SLTs, and limited access to early intervention in rural areas and countries with limited resources such as Malaysia (Joginder Singh et al., 2016; Yong & Wong, 2015). By empowering parents as co-therapists, PMIs may also improve parents' well-being through stress reduction and increase their child caregiving competence (Hemdi & Daley, 2017; McConachie & Diggle, 2007).

However, not all children experience positive effects immediately post-PMIs (Beaudoin et al., 2014; Nevill et al., 2018; Oono et al., 2013). For example, Carter et al.'s (2011) randomised

controlled trial of HMTW, a short-term 14-week early language PMI on 62 toddlers with ASD, found a lack of intervention effects on the residualised gains in parental responsivity (Glass's Δ = .71) and toddlers' communication skills (Glass's Δ = .50). Carter et al. (2011) also revealed that the toddlers' communication outcomes were moderated by their object interest at baseline. Toddlers who had lower object interests at baseline showed greater improvements in their communication skills as compared to toddlers with higher object interests at baseline.

In a systematic review of 15 PMI studies for 484 toddlers with ASD, Beaudoin, Sébire, and Couture (2014) found inconsistent gains in child outcomes such as communication skills, social emotional functioning, symptom severity, and play skills. In contrast to these inconsistent child outcomes, improvements in parent outcomes such as attitudes and skills, satisfaction, and strategy implementation showed greater consistency post-intervention. Beaudoin et al. (2014) concluded that many of these studies could only show small effect sizes due to methodological limitations.

Similarly, two meta-analyses had highlighted the following findings. First, Oone et al's (2013) meta-analysis of 11 PMI studies reported no statistically significant gains in child outcomes (e.g. children's initiations, expressive language, social communication, and adaptive behaviours) post-intervention although parents perceived improvements in their children's receptive vocabulary, parent-child interactions, and ASD symptom severity (Oono et al., 2013). Second, Nevill et al's (2018) meta-analysis of 19 PMI studies reported significant effects in parent-reported children's communication-language skills but nil effect in children's socialisation (Nevill et al., 2018). The lack of consistency on the immediate effects of child outcomes could be potentially due to the heterogeneity of ASD (Baker-Ericzén et al., 2007) and short intervention duration (Wolstencroft et al., 2018).

Two local Malaysian studies that examined the impacts of two short-term PMIs (i.e. HMTW and DIR/Floortime) on Malaysian children with ASD found that the interventions resulted in increased parents' use of interaction and language facilitation strategies (Sokmum et al., 2017), enhanced parent-child interactions, increased parents' perceptions of life quality, anxiety, parenting

competence, stress level (Shamsudin, 2018), improved children's vocabulary, communication, and social skills (Sokmum et al., 2017) post-PMI. Both studies suggested that their targeted PMIs could be implemented on Malaysian families of children with ASD (Shamsudin, 2018; Sokmum et al., 2017). However, their results have to be interpreted within the constraints of the research designs used, i.e. single-subject study and quasi-experiment. Without a randomised control design and blinding of outcome measures, the studies were inclined to present with issues like selection bias.

Cultural Influences on JA-Based PMIs

Currently, the understanding of PMIs' effectiveness is largely drawn from Western mainstream cultures (Larson et al., 2020; Van Kleeck, 1994) and high-resource countries (Liu et al., 2020). These studies suggest that responsive toward children's JA, child-directed interactions, and/or speech are more facilitative and supportive of children's development than adult-directed interactions and/or speech (Levickis et al., 2018). Thus, existing PMIs mainly coach parents to apply a predetermined series of strategies to promote these specific interaction behaviours. These predetermined strategies may not always align with a family's cultural, ethnic, and linguistic group. By involving parents and enhancing parent-child interactions with child-centred practices, PMIs draw assumptions that parents are children's primary caretakers who view (a) children as equal communicator partners within their social organisation, (b) interaction behaviour within the family is equal and dyadic, (c) communicative intention is developed prior to children's speech development, (d) children learn language through engagement with their parents in their daily routines, and (e) talkative children are competent (Van Kleeck, 1994, 2013). These assumptions may be biased and not be congruent with all families and cultures because parent-child interaction behaviours are not universal across cultures. These cultural variables can affect PMIs' fidelity, engagement, and effects (Kumpfer et al., 2002; Larson et al., 2020).

Cross-cultural studies of Western mainstream and Asian cultures indicate that the parents from both cultures believe in the importance of child-centred interactions (Adaikkalasamy, 2015; Johnston & Wong, 2002; Yorke, 2016) but the way these parents interact with their children differ

across cultures (Rochanavibhata & Marian, 2020). Aligning with Vygotsky's (1979) cultural social interaction model, evidence supports parent-child interactions to be rooted in cultural-specific values, beliefs, and practices (Parada, 2013). Van Kleeck (1994) highlighted five key cultural dimensions that affect JA in parent-child interactions: (a) social organisation, (b) status of interaction, (c) beliefs about intentionality, and (d) language teaching beliefs, and (e) value of talk.

Cultural Differences in Beliefs and Practices of Parent-Child Interactions in Malaysia

Despite being the dominant culture in Malaysia, how the Malay culture influences parent-child interaction behaviours is unclear. This section outlines Van Kleeck's (1994) five cultural dimensions that may underlie the beliefs and practices of parent-child interactions among Malaysian parents. Table 2.1 compares Malaysian/Asian and Western parents' beliefs and practices of parent-child interactions.

Social Organisation. In contrast to largely equalitarian Western mainstream cultures, Malaysian, like other Asian countries uphold a hierarchical and patriarchal social structure (Keshavarz & Baharudin, 2009). SLTs and parents are likely to view the SLT as the sole expert in the SLT-parent team (Yong & Wong, 2015), and therefore, may reflect a top-down rather than equal SLT-parents partnership. When compared to their Australian counterparts, Malaysian SLTs are less likely to incorporate parents' decisions into intervention, less likely to involve parents actively in assessment and intervention; and more likely to retain parents' roles as mainly passive observers (Joginder Singh et al., 2011). On the other hand, parents may adopt a non-assertive role (Abdullah, 2005) and hold back their opinions when they disagreeing with the SLT's or not confident to be the co-therapist in PMIs. Additionally, Malay parents of children with ASD may feel obliged to make intervention decisions based on family rules determined by the grandparents instead of collaborating with the SLT (Hossain et al., 2005; Lian & Abdullah, 2001). A recent study by Sumari et al. (2019) found that over the years, there has been a gradual shift from patriarchy to equalitarian structures within the family in the Malay family's social organisation.

Table 2.1

Cultural Differences in Beliefs and Practices of Parent-child Interactions between Malaysia, Asian and Western Countries

Country	Malaysia, Asian countries	Western countries
Examples of cultural groups	Chinese, Chinese-Canadian, Guatemalan Mayan, Malaysian, etc.	British, Euro-Canadian, American, New Zealanders, etc.
Social organisation	Hierarchical and patriarchal (Keshavarz & Baharudin, 2009)	Equalitarian
	SLT practices: Less SLT-parent partnerships, SLTs are the experts while parents are the novice (Yong & Wong, 2015).	SLT practices: Parents are viewed as equal partners in an intervention (Yong & Wong, 2015).
Status of interaction	Adult-directed interactions	Child-directed interactions
Beliefs about intentionality	Parents prefer adult-directed teaching although they believe that children have their own communicative intentions (Adaikkalasamy, 2015)	Parents believe in developing children's communicative intentions prior to children's speech development (Girolametto et al., 2002; Mundy, 2018)
Language teaching beliefs	Direct language teaching; adult-directed speech (Adaikkalasamy, 2015; Hewitt & Maloney, 2000; Joginder Singh et al., 2015; Shamsudin, 2018)	Child-directed speech (i.e. follow children's lead, children are equal communicative partners)
Value of talk	Value children to be talkative than parents (Adaikkalasamy, 2015)	Value parents to be talkative than children (Adaikkalasamy, 2015)

Status of Interaction. Parent-child interaction behaviours such as following children's lead (i.e. child-directed and parental responsivity) and turn-taking are highlights of PMIs (Greenspan & Wieder, 2006; Sussman et al., 2016). However, parents from different cultures may adopt different types of control and thus respond differently towards their children's interaction. Cross-cultural studies have shown that Chinese, Chinese-Canadian, Guatemalan Mayan, and Malay parents are more adult-directed, and have a higher tendency to direct their children's attention (Vigil, 2002)

than British, Euro-Canadian, American, or New Zealander parents, who use more child-directed interactions when engaging with their children (Adaikkalasamy, 2015; Chavajay & Rogoff, 1999; Johnston & Wong, 2002; Parada, 2013; Rogoff et al., 1993; Simmons & Johnston, 2007; Yorke, 2016). Local Malaysian studies indicate that Malaysian parents also tend to be adult-directed when interacting with and teaching their children (Hewitt & Maloney, 2000; Joginder Singh et al., 2015). Joginder Singh et al. (2015) found that Malaysian mothers directed high rates of interactions with their children. However, instead of being ineffective, the directiveness used in initiating and creating turn-taking opportunities in these families' contexts were believed to facilitate their children's participation in reciprocal interactions and support children's language learning (Roach et al., 1998), suggesting culture-specific variation in the way parents support their children's social interactions.

Beliefs about Intentionality. PMIs holds the assumption that communicative intention is developed prior to speech (Girolametto et al., 2002; Mundy, 2018). Hence, parents are trained to listen and interpret children's sounds, vocalisation, or babbling even though their children are non-verbal. A cross-cultural study by Adaikkalasamy (2015) reported that both New Zealand and Malaysian mothers believed that intentionality begins before children talk. Although both mothers agreed that it was important for mothers to find out their children's intentionality, irrespective of their ethnicities, a more significant number of Malaysian mothers (70%) than New Zealand mothers (11.8%) preferred to teach and tell their children what to say because they believed that children were too young to think on their own.

Language Teaching Beliefs. Many language-based PMIs help parents enhance their application of language facilitation strategies on their children. However, a number of studies have generally reported that Malaysian parents employ adult-directed speech (Adaikkalasamy, 2015), request action, objects and information from their children (Joginder Singh et al., 2015), use response-control utterances, ask test questions, correct children's speech errors (Adaikkalasamy, 2015), and prefer their children's teachers to use formal teaching (i.e. adult-directed) more than play-based methods (i.e. child-centred) with their preschool children (Hewitt & Maloney, 2000).

Shamsudin (2018) interviewed 10 Malaysian parents of children with ASD who completed the DIR/Floortime (Greenspan, 1992; Greenspan & Wieder, 1999, 2006), a PMI, revealed that some of the parents believed that their children would disrespect them when they "follow their children's lead". These parents had doubts and faced challenges in the initial stage of the intervention due to their parenting styles and beliefs. The parents also expressed that they did not know how to play, and perceived play as a waste of time and had no benefit. Thus, cultural differences in language teaching beliefs may impose extra challenges for Malaysian SLTs using PMIs that focus on following the children's lead.

Value of Talk. Traditional Malays embrace high-context culture (Salleh, 2005), and often embed hidden messages in their spoken or written language (Nishimura et al., 2008). Making a request outrightly would be perceived as impolite in the traditional Malay culture. Chan & Chen (2011) also revealed that Asian parents may consider children as rude if the children interrupt their parents' speech. However, Adaikkalasamy's (2015) study found that more Malaysian mothers than New Zealand mothers believed it was important for their children to be talkative. The study further indicated that Malaysian mothers, regardless of their ethnicity tended to say a shorter mean length of utterance when compared with US English-speaking mothers with children of similar age. The findings suggest differences in the way parents of different cultures value talk with their young children.

In summary, previous studies suggest that Malaysian parents may: (a) value their children's talkativeness but not necessarily view them as equal communicating partners due to the hierarchical and patriarchal social organisation adopted by the community (Keshavarz & Baharudin, 2009), and (b) believe in the importance of children's communicative intention but prefer adult-directed interactions and a more directive language teaching approach (Adaikkalasamy, 2015; Hewitt & Maloney, 2000; Joginder Singh et al., 2015). These cultural dimensions are only partially aligned with the parent-child interactive principles that are emphasised in internationally practised PMIs such as the DIR/Floortime (Greenspan, 1992; Greenspan & Wieder, 1999, 2006) and HMTW (Sussman, 1999;

Sussman et al., 2016). Therefore, there is an urgency to establish the extent of effectiveness and feasibility of PMIs in Malaysia, in light of these cultural differences. Motivated by the lack of evidence to support the use of PMIs in the context of Malaysia, my study also aimed to investigate how Malay mothers of children with ASD view family-centred intervention and practices of parent-child interactions before and after attending the M-HMTW, a PMI.

Chapter 3: Method

This chapter presents the methodology employed to address the research purpose and research questions of the study. The study's design, participants, procedure, research instruments, and outcome measures are presented.

Study Design

The study employed a randomised controlled trial (RCT) experimental study to determine the effectiveness of the M-HMTW, a PMI. The RCT was used as it could eliminate selection bias, ensure the data's reliability, and the validity of the statistical analyses to produce robust findings when comparing the groups in the study. The effects of the study were compared between the M-HMTW (Sussman, Drake, Lowry, & Honeyman, 2016), and the treatment as usual (TAU) one-to-one therapist-mediated language intervention.

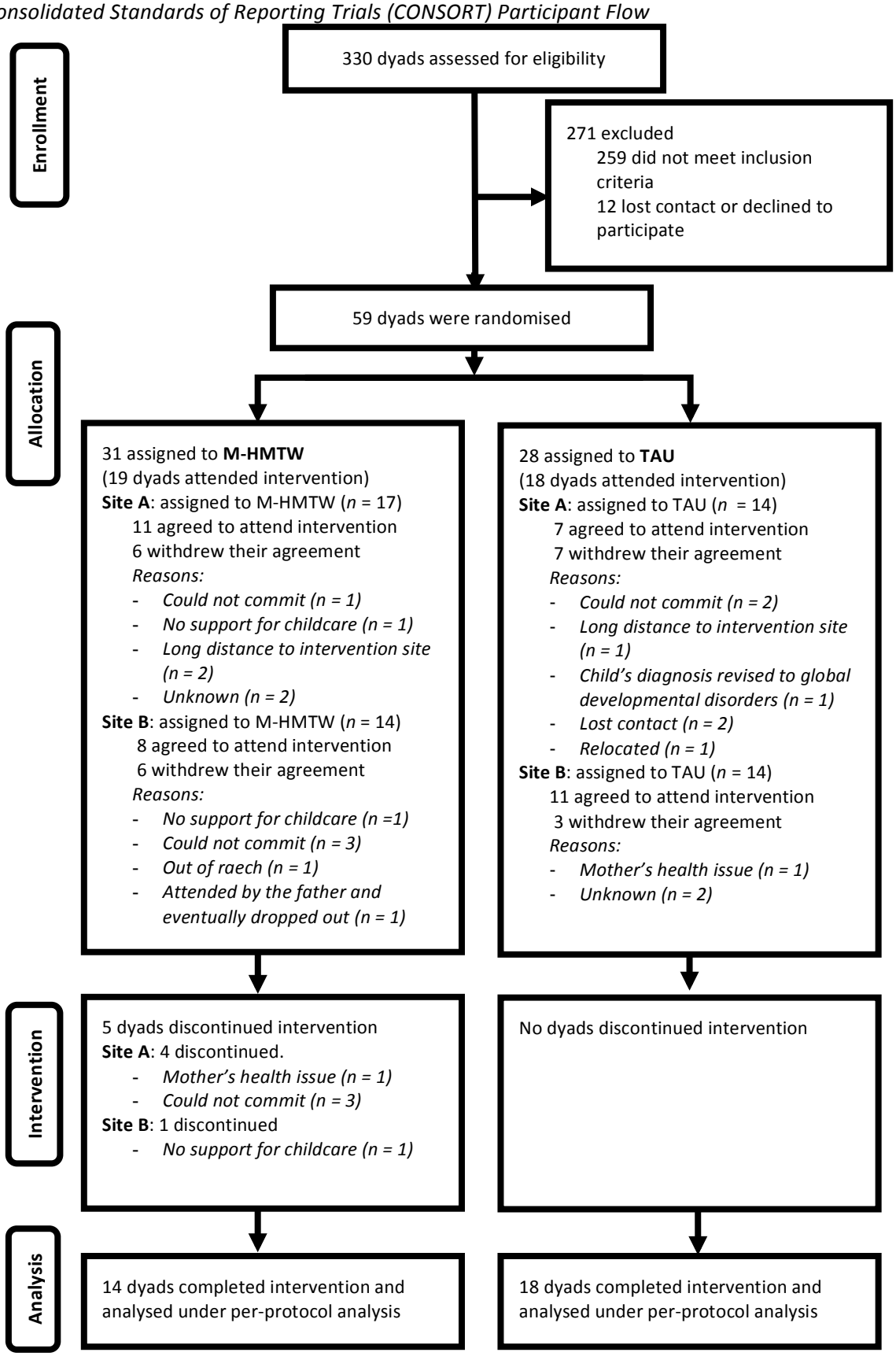
Participants

The participants were preschool children with ASD and their mothers. They were recruited to attend intervention at two sites, Site A and Site B. Both sites were located in an urban area in the central region of the Peninsular Malaysia. Site A was a speech-language intervention centre. Site A's participants were recruited from private intervention centres, non-governmental organisations, and parent support groups. Site B was a public hospital. The participants from Site B were recruited from the hospital's speech-language therapy waiting list.

Participant recruitment adhered to the Consolidated Standards of Reporting Trials (CONSORT). CONSORT is developed to enhance the reporting of randomised controlled trial and research quality in health-related research (CONSORT, 2010). The flow of participant recruitment is shown in Figure 3.1. A total of 330 mother-child dyads from both sites first responded to the call for participation in the research. Participant inclusion and exclusion criteria were established to control the effects of confounding variables such as the variation in cultural and language differences among the participants. The following inclusion and exclusion criteria were used to identify the eligibility of the mothers and their children for this study.

Figure 3.1

Consolidated Standards of Reporting Trials (CONSORT) Participant Flow



Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual

Inclusion Criteria

- A child with a provisional and/or diagnosis of ASD, ASD features, and social communication challenges;
- The child was between two and five years old during the course of intervention; and
- Both the mother and child belonged to the Malay ethnic group and were native speakers of the Malay language. Fathers were excluded due to father-mother differences in communication and interaction styles with children (Flippin & Watson, 2015).

Exclusion Criteria

- The child had a comorbidity of sensory impairment such as blindness or hearing impairment; and
- The mother had known mental health difficulties such as depression.
- Families who was at the time of the study, were participating in another PMI or family-centred intervention.

Of the 330 parents who expressed interest to participate in the study, 259 dyads were identified as ineligible (e.g. the child was older than five years old, not of Malay ethnicity, had isolated speech-language delays/disorders, or was diagnosed with other developmental disorders). Upon receiving further information about the study, 12 mothers were neither contactable nor interested to join while the remaining 59 mothers consented to the study. At this stage, they were only told that they would be randomly assigned to one out of the two types of language intervention. However, participants from the TAU group were given the option to join the next M-HMTW offered at their respective intervention sites.

Randomisation and Masking

An anonymous code was assigned to each of the 59 dyads to be used for simple randomisation and in research-related documents. As there were two pairs of twins at Site A, the same code was assigned to both pairs to ensure that they were assigned to the same group. To reduce selection bias, the list of anonymised codes was then sent to the core project's principal

investigator for randomisation to either the M-HMTW or the TAU group. The principal investigator had no contact with the participants. Using the Research Randomizer software (Urbaniak & Plous, 2013), the mother-child or mother-twins dyads were randomised to one of the two groups within the site where they were first recruited.

Following randomisation, 53% (n = 31) and 47% (n = 28) of the mother-child or mother-twins dyads were assigned to the M-HMTW group and the TAU group respectively. However, 22 dyads ($n_{\text{M-HMTW}}$ = 12; n_{TAU} = 10) did not commence intervention. They either withdrew before the pre-intervention assessment (T1) or before the start of the assigned intervention. The remaining 37 dyads ($n_{\text{M-HMTW}}$ = 19; n_{TAU} = 18) commenced the assigned intervention at their respective sites. Subsequently, five more dyads from the M-HMTW group discontinued intervention after attending a maximum of two sessions. In the end, only 32 dyads ($n_{\text{M-HMTW}}$ = 14; n_{TAU} = 18) completed their assigned intervention and attended the post-intervention assessment (T2).

Demographics

Participant demographics of intervention groups at T1 are displayed in Table 3.1. The final sample consisted of 32 mothers who were aged between 27 and 42 years old (M = 33.38, SD = 3.50) when they first participated in the study. Their children, 25 boys and seven girls, were aged between 23 and 56 months old (M = 43.78, SD = 9.16) when they first participated in the study. Group differences related to participant demographics were analysed using the Mann-Whitney (U), Chi-square (χ^2), or Fisher's Exact (χ^2) tests. No significant differences were found in relation to all the demographic variables between the M-HMTW and TAU groups. This indicated homogeneity in the demographic variables at T1 before the interventions commenced.

Table 3.1

Participant Demographics of Intervention Groups at Pre-Intervention (T1) Assessment

	M-HMTW			TAU			$U / \chi^2 / F^2$
	n	*M*	*SD*	*n*	*M*	*SD*	
Mother							
Age (year)	14	33.1	3.66	18	33.6	3.52	U = 117.5, p = .75, r = .06
Occupation							
Working (%)	8	52.6		5	27.8		$\chi^2(1, 32) = 2.815$, p = .09, φ = .30
Not working (%)	5	47.4		13	72.2		
Highest education level (%)							
< Tertiary	1	10.5		3	16.7		$F^2(1, 32) = 0.688$, p = .61, φ = -.14
≥ Tertiary	13	89.4		15	83.2		
Household income[a]							
< RM6,000 (%)	5	47.4		11	61.2		$\chi^2(1, 32) = 2.032$, p = .15, φ = -.25
≥ RM 6,001 (%)	9	52.6		7	38.9		
Child							
Age (month)	14	44.1	9.97	18	43.6	8.76	U = 119.0, p = .79, r = .05
Gender							
Male (%)	12	89.5		13	72.2		$F^2(1, 32) = 0.867$, p = .43, φ = .16
Female (%)	2	10.5		5	27.8		
Communication							
Non-verbal (%)	3	21.4		10	55.6		$\chi^2(1, 32) = 3.802$, p = .05, φ = -.36
Verbal (%)	11	78.6		8	44.4		
Time spent with mother (%)	14	49.3	18.88	18	48.3	15.81	U = 120.5, p = .83, r = .04

Note. M-HMTW = Malay translated Hanen More Than Words, TAU = treatment as usual.

[a]Based on an approximate median of RM5,228 and mean of RM 6,958 monthly household income in Malaysia

(Department of Statistics Malaysia, 2017).

Ethical Approvals

This study was conducted as part of a larger project that aimed to investigate the effectiveness of a JA-based and family-centred early language intervention for children with ASD and within the Malay cultural and linguistic context in Malaysia. Ethical approvals for the project were obtained from the University of Nottingham Malaysia. As Site B was a public hospital, ethical approvals were also obtained from the Malaysian National Medical Research Register, Medical Research and Ethics Committee, and the hospital itself. The ethical approvals ensured that the project maintained high ethical integrity and adhered to all the relevant codes of good research practice.

Procedures

After randomisation, I contacted the mothers to make arrangements for the T1 assessments. They were sent an online version of an information sheet for parents (Appendix A), a parental consent form (Appendix B), and a video consent form (Appendix C). The information sheet for parents comprised the study's aims and protocols, confidentiality issues, and the right to withdraw from the study at any time without giving any reasons. The mothers either provided their written consent online prior to or during the T1 assessment. Mothers who had limited internet access or difficulties in completing the forms online were given assistance to complete the forms on the day of the T1 assessment.

Pre-intervention (T1) Assessment

Baseline data of the mother and child outcomes were obtained through the assessment conducted before the intervention. It was conducted with each mother-child dyad at their assigned intervention site. The mothers were asked to fill out three online questionnaires: (a) the Parental Beliefs and Practices Questionnaire (Appendix D), (b) the Trilingual MacArthur-Bates Communicative Development Inventories (Trilingual MCDI; Low, 2009), and (c) the Language Use Inventory (LUI; O'Neill, 2009) at home before the assessment date. During the assessment, the mothers were given details about the type of intervention assigned to them. The mothers were not blinded to the

intervention type because the study required active maternal involvement (e.g. mothers attended the sessions and carried over the intervention at home). Qualified SLTs, who were also the children's interventionists in this study, conducted all the assessments. Each assessment took about 1.5 to two hours. The assessment started with a 45-minute case history taking and an informal assessment of the child's speech, language, and social communication skills. It allowed the SLT to determine the child's baseline and develop individual intervention goals. Then, I videotaped each mother-child dyad's interactions using a Panasonic video camera (model HC-VX980) in a quiet room. The interactions were guided by an adapted Communication Play Protocol (CPP; Adamson & Bakeman, 2016). After the video-recording session, mothers who did not manage to complete the three online questionnaires at home filled out the questionnaires with the first author's assistance via a Lenovo Tab 3 8 tablet.

Intervention

The interventions were short-term and delivered within four months. SLTs, who were independent of the research team and blind to the hypotheses and analyses of this study, administered the interventions at their sites. The SLTs were, however, aware of the two types of intervention involved in the study. As parental participation and communication with the interventionists improved when parents speak in their native language (Benson, 2002), both the M-HMTW and TAU interventions were carried out in Malay, the participants' native language.

M-HMTW. This study utilised the M-HMTW which is a Malay-based More Than Words intervention that was formulated through the translation of the fourth edition of the English-based Hanen More Than Words (HMTW) programme (Sussman et al., 2016). Only the HMTW presentation slides and parental handouts were translated. The translation was permitted by The Hanen Centre of HMTW and followed a systematic translation and adaptation process that was adopted from the WHO (2019). The process involved multiple stages of forward-and-backward translations by local Malay-English bilingual SLTs and expert consultation with two Malay language experts.

Adhering closely to the HMTW, the M-HTMW was primarily parent-mediated for parents of

children with ASD or communication difficulties. The ultimate goal of the M-HMTW was to empower parents as agents of change and equip them with responsive interaction and language facilitation strategies that promote their children's communication in naturalistic environments (Sussman, 1999; Sussman et al., 2016). The M-HMTW consisted of an orientation session, a pre-programmed consultation (conducted during the T1 assessment), and eight group sessions interspersed with three individual sessions. Appendix E outlines the structure of the HMTW.

The parental group sessions were conducted using various learning formats such as theoretical presentations, small group discussions, video observations, and role-play. In the group sessions, the parents were first taught to identify their children's communication stage. They also learned a series of Hanen strategies to provide responsive interactions (i.e. observe, wait and listen, follow the child's lead) and language facilitation (i.e. say less, stress, go slow, and show) to their children. With the guidance of their SLT, parents planned home activities in a structured sequence by focusing on their children's levels. At home, parents carried out the plan through daily routines and activities. Parents were required to report back their progress in the subsequent group session. Additionally, each mother also attended three one-to-one video-feedback sessions with her child. The mother interacted with her child based on her planned home activities while the SLT used a video recording to provide feedback, coach the mother on her use of interaction and language facilitation strategies.

In this study, the M-HMTW sessions were conducted once every two weeks and the entire intervention lasted over a course of four months. The total SLT-mother contact time was approximately 24.25 hours. Following the availability of the SLTs, the M-HMTW was delivered on weekends at Site A and weekdays at Site B. Both intervention sites used the same translated slides and handouts provided by the research team. Intervention fidelity of the M-HMTW implementation at both sites was established through adherence to the conduct of HMTW, Hanen's recommended content, activities, and group size. At each site, a qualified Malaysian Malay-speaking SLT who was also certified in conducting the original HMTW conducted the M-HMTW. Both SLTs held an active

Hanen membership and had attended a three-day HMTW workshop by an instructor from The Hanen Centre.

TAU. Four qualified Malaysian SLTs conducted the TAU, a primarily one-to-one therapist-mediated language intervention at the two sites (i.e. one SLT at Site A, three SLTs at Site B). The fidelity of the TAU structure was established by following the frequency and duration of language intervention sessions according to the protocol implemented at Malaysian public hospitals (Joginder Singh et al., 2011, 2016). For example, each TAU session lasted for about 45 minutes and the children received a session every four to six weeks across four months. The total TAU intervention time was only 2.25 hours. The intervention structure of the TAU was flexible in its delivery protocol that shared similar goals, delivery format, and practices as reported in Joginder Singh et al.'s (2011) study. The TAU intervention goals were predominantly language-based and specifically individualised according to the children's unique needs such as pre-verbal, social communication (i.e. requesting), play skills (Joginder Singh et al., 2011), and language skills. The SLT determined two to three intervention goals per session, then conducted activities that were relevant to the child's goals. The SLT provided the TAU directly to the child rather than worked through parents as intervention agents. The mothers' active involvements during the TAU sessions were not obvious. They attended their children's sessions, mainly as the observer. At the end of the session, a five-to-10-minute debriefing session was conducted with the mother. Then, the mothers were asked to carry over activities with their child at home.

Table 3.2 summarises the comparison between the M-HMTW and TAU interventions. The M-HMTW differs from the TAU in a number of ways that include scheduling, total intervention time, and parental involvement. Unlike the M-HMTW, the TAU did not follow any scheduled group-based topics. Thus, a cancelled session was always replaced with another session. Besides, compared to the M-HMTW that had a total of 24.25 hours of intervention time with the SLT, the TAU had a distinctly shorter duration of intervention time, only a total of 2.25 hours across four months. Both interventions involved mothers in a notable manner. The M-HMTW provided direct training, detailed

information, and explicit steps in coaching the mothers. In contrast, in the TAU, the mother observed how the SLT conducted the intervention on her child, before being expected to replicate and carry out the taught activities with her child at home until her child met the SLT again. Even so, both the M-HMTW and TAU interventions shared common characteristics which resembled the general SLTs' practices in Malaysia (Joginder Singh et al., 2011). For instance, mothers and all the SLTs utilised conventional activities, such as toy play, structured learning materials, and books to provide the interventions. None of them used technology, i.e., computer software and mobile applications. Besides, none of the SLTs targeted and introduced an augmentative and alternative communication to the child and family.

Post-intervention (T2) Assessment

A battery of T2 assessments was administered within one to two months after the intervention. The procedure was similar to that of the T1 except that case history taking was no longer conducted. Each assessment took about 1.5 hours. The assessment included the completion of the online Parental Beliefs and Practices Questionnaire (Pappas et al., 2008; Simmons & Johnston, 2007), Trilingual MCDI (Low, 2009), and LUI (O'Neill, 2009), and the videotaping of the mother-child dyad interactions according to the adapted CPP (Adamson & Bakeman, 2016). Eventually, the changes in the mother and child outcomes were measured after the interventions and compared with the baseline data.

Instruments and Outcome Measures

Table 3.3 shows the outcome measures of this study. Two mother outcomes and five child outcomes were generated from the five instruments. The mother outcomes (i.e. their beliefs in family-centred intervention and practices of mother-child interactions) were obtained through the Parental Beliefs and Practices Questionnaire (Pappas et al., 2008; Simmons & Johnston, 2007). The child outcomes, JE, language and social communication skills were rated from the video recordings using the Joint Engagement Rating Inventory (JERI; Adamson et al., 2016), the Trilingual MCDI (Low, 2009), and the LUI (O'Neill, 2009) respectively.

Table 3.2

Comparison between the Malay-based Hanen More Than Words (M-HMTW) and Treatment-as-usual (TAU) Interventions

Intervention	M-HMTW	TAU
Characteristics	PMIs	Therapist-mediated
Interventionist	Coach: Qualified Malaysian Hanen certified SLTs in HMTW (*n* = 2) Co-therapist: mothers	Therapist: Qualified Malaysian SLTs (*n* = 4)
Fidelity	Adhered to the conduct of HMTW (i.e, content, activities, and group size).	Adhered to the conventional conduct of language intervention at Malaysian public hospitals.
Frequency	Fortnightly, within four months	Four-six weeks once, within four months
Total intervention time	Total = 24.25 hours Three 45-minute 1:1 video feedback sessions One orientation session Eight 2.5-hour parent groups	Total = 2.25 hours Three 45-minute 1:1 sessions
Delivery format	Mix of 1:1 and group sessions. Theoretical presentations, small group discussions, video observations, and role-play.	1:1 Therapist–child Therapist planned and conducted intervention goals and activities.
Intervention goals	Focused on training and coaching the parents to increase child's communication using daily routines.	Language-based therapy Focused on child's pre-verbal, play, language, and communication (i.e. requesting) skills.
Parental involvement	Mothers received direct training, detailed information, explicit steps, and individual coaching through 1:1 video feedback sessions. Mothers planned their child's intervention goals and activities.	Mothers as observers. They saw how the SLT conducted the intervention and were expected to carryover activities from therapy to home until they met the SLT again.
Similarity		
Setting	Centre or clinic in the public hospital	
Language used	Malay (native language)	
Materials	Used toys, learning materials and books.	

Table 3.3

Instruments Used and Outcome Measures

Measures	Instruments	Remarks
Mother outcomes	Parental Beliefs and Practices Questionnaire (Pappas et al., 2008; Simmons & Johnston, 2007)	Parent-reported questionnaire
Beliefs in family-centred intervention		It was translated from part three of the Parental Involvement in Speech Intervention Survey (Pappas et al., 2008).
Practices of mother-child interactions		It was translated from part two of the Child-Rearing Practices and Beliefs Survey (Simmons & Johnston, 2007)
Child outcomes	JERI (Adamson et al., 2016)	Independent-rated measure
JE		Seven-point Likert scale rating of four CPP clips
Supported JE		
Coordinated JE		
Language	Trilingual MCDI (Low, 2009)	Parent-reported questionnaire
Total receptive vocabulary		
Total expressive vocabulary		
Social communication	LUI (O'Neill, 2009)	Parent-reported questionnaire
		It was verbally translated with the scripted LUI Malay translation

Note. CPP = Communication Play Protocol; JERI = Joint Engagement Rating Inventory; MCDI = MacArthur-Bates Communicative Development Inventory; LUI = Language Use Inventory

Parental Beliefs and Practices Questionnaire (Pappas et al., 2008; Simmons & Johnston, 2007)

The questionnaire was adapted and translated into Malay by Wong et al. (2017) based on two questionnaires: (a) Child-rearing Beliefs and Practices Survey (Simmons & Johnston, 2007) and (b) Parental Involvement in Speech Intervention Survey (Pappas et al., 2008). Both questionnaires were translated into Malay following permission for their adaptation and translation. The translation validity and factor analysis was determined through the forward-and-backward translation and Kaiser-Meyer-Olkin (KMO) Test, respectively (Wong et al., 2017).

The questionnaire comprised four sections. However, only data from Section A, B, and D were analysed. Section A was related to family demographic information that was translated from Simmons and Johnston's (2007) survey. The original questionnaire consisted of 15 items. Only five

items that were relevant to this study were used, such as participant's personal information (i.e. child's date of birth, diagnosis, and mother's age) and family's socioeconomic status (i.e. mother's occupation and household monthly income).

Section B was related to beliefs and practices in parental involvement in early language intervention, which was translated from part three of Pappas et al.'s (2008) survey. The section comprised 15 items, including typical involvement of parents in different phases of language intervention (e.g. present during a session, involve in goal-setting, decide final intervention goals, and conduct home programme) and intervention provision (family-centred versus therapist-centred practices). Responses were indicated on a five-point Likert scale, with one being "strongly disagree" and five being "strongly agree".

Section D was related to practices of mother-child discourse while interacting with a child (KMO =.78; Wong et al., 2017). The questions were translated from part two of Simmons and Johnston's survey (2007). This section consisted of 12 items, including the subdomain of (a) joint involvement in the children's daily routines (e.g. time spending with the children in activities such as going to the park, playing or reading a book), (b) conversational practices (e.g. topic continuing talk and provide language stimulation in daily activities), and (c) use of scaffolding techniques (e.g. expansion and follow-in questions). Except for the joint involvement activities (.60), Cronbach's alpha values for the other two practice dimensions were at an acceptable level (.73-.77; Wong et al., 2017).

The contents of the Parental Beliefs and Practices Questionnaire were presented to the mothers through an online Google Form. An online questionnaire was chosen as opposed to a paper-based questionnaire due to a few factors. Firstly, the use of the online form was cost-effective and environmentally friendly. Paper, printing and postage fees were saved. Secondly, the duration for data collection was significantly reduced. However, a paper-based questionnaire and tablet were also provided at the site of assessment for mothers who did not manage to fill out the online questionnaire prior to the assessment.

Communication Play Protocol (CPP; Adamson & Bakeman, 2016)

The CPP was used as a guideline for the mother-child dyads' interaction. As opposed to just free play in most studies, Adamson and Bakeman (2016) revealed that children's JE vary according to communication contexts. The CPP, therefore, provided a framework for structuring the samples of mother-child dyads' interaction in different contexts. The CPP originally comprised 14 scenes that allow for the systematic sampling of semi-structured adult-child dyads' interactions across four communication contexts (i.e. social-interacting, requesting, commenting, and narrating). The instructions for each scene were written on a specific cue card and given to the adult at the beginning of the scene.

The CPP is flexible in terms of adaption of its protocol, thus changes that suit the purpose of this study is permitted. Permission to adapt the CPP was granted by Lauren Adamson, the first author of CPP. The study utilised three scenes from the original CPP, i.e. "turn-taking" (social-interacting), "help me" (requesting), and "hidden objects" (commenting). A "book" scene (narrating) was added to this study to reflect a key topic of HMTW/M-HMTW. In this study, the written instructions for each scene were given in both English and Malay and displayed on an A4-sized cue card.

Before the video recording, the CPP protocol was briefly explained to the mother. The mother was encouraged to play and interact with her child as she normally would. The interaction began with three to five minutes' free play and was followed by four CPP scenes. The sequence of the scene presentation was randomly counterbalanced across all participants. At the beginning of each scene, the mother was given a bilingual instruction cue card to read. A unique set of toys was provided for each scene (refer to Appendix F) and the mothers were told to use any but not necessarily all of the toys provided. During any unforeseen conditions such as when a child was crying, got frustrated, threw a tantrum, or could not calm himself/herself, the video recording was discontinued.

Joint Engagement Rating Inventory (JERI; Adamson et al., 2016)

The JERI was first developed to rate the mother-child dyads' interactions using the CPP scenes or other dyadic interactions. JERI was also developed for young children with typical development, ASD, and other developmental challenges. As of 2019, the JERI comprises 18 rating items that were divided into four clusters: (a) the children's JE (i.e. total JE, supported JE, coordinated JE, and symbol-infused JE), (b) children's behaviour (e.g. expressive language use, initiation of communication), (c) caregiver (e.g. scaffolding, symbol highlighting, caregiver's affect), and (d) shared topic (e.g. fluency and connectedness, elaboration of a shared topic). Each item was rated on a seven-point Likert scale (1 = *a very low rating*, 4 = *anchor* or *midpoint*, and 7 = *a very high rating*). Similar to the CPP, the JERI is flexible and allows for adaptations to address specific research questions and/or cultural-specific analyses.

Rating Items. In this study, supported JE and coordinated JE were used to analyse the children's JE. Employing Adamson et al.'s (2016) definitions, supported JE is joint engagement time when both the child and the mother are actively involved with the same object or event but the child is not actively acknowledging the mother (see Table 3.4). Coordinated JE is defined as the joint engagement time when both the child and the mother are actively involved with the same object or event, and the child is actively and repeatedly acknowledging the mother. All recordings, obtained from a total of 44 participants x 4 CPP scenes (recorded before intervention, T1) and post- 32 x 4 CPP scenes (recorded right after intervention, T2) were equally distributed among four research assistants who were blind to the study's aims, participants' details (i.e. children's diagnosis, age, and language outcome), and assessment time points. The research assistants independently rated the videos assigned to them. They first rated each child's supported JE and coordinated JE in every CPP scene by using JERI's 7-point scale. After the scoring rates have been adjusted following the inter-rater reliability exercise, the mean scores of supported JE and coordinated JE were computed from all four scenes' rates. The mean scores were used as their supported and coordinated JE measures.

Table 3.4

Joint Engagement Rating Inventory (JERI) Rating Items

		Anchors		
Rating item	Definition	1 =	4 =	7 =
JE				
a) Supported JE	The child and the mother are actively involved with the same object or event but the child is not actively acknowledging the mother.	No episodes of the JE state	Spends about a third of the scene in supported JE that is of moderate quality, briefly in supported JE in a strikingly high manner	Frequently in rich and varied episodes of supported JE
b) Coordinated JE	The child and the mother are actively involved with the same object or event and the child is actively and repeatedly acknowledging the mother.	No episodes of the JE state	Spends about a third of the scene in coordinated JE that is of moderate quality, briefly in coordinated JE in a strikingly high-quality manner	Frequently in rich and varied episodes of coordinated JE

Note. JE = joint engagement.

Inter-rater Reliability. 32% of all videos recorded were randomly chosen for inter-rater reliability. Each of the four research assistants rated an additional of 5-8 sets of 4 CPP scenes (i.e., 8% each) that were first assigned to another research assistant. Their rated agreement was calculated by the formula, (total videos with the same rating/ total videos rated) x 100%. Inter-rater reliability agreement was 79% for supported JE and 86% for coordinated JE, indicating moderate to high reliability (Bakeman & Quera, 2011).

Trilingual MacArthur-Bates Communicative Development Inventory (Trilingual MCDI; Low, 2009)

The Trilingual MCDI was adapted from the MCDI (Fenson et al., 1993), an internationally recognised instrument that provides a valid and systematic way of assessing a child's vocabulary both receptively and expressively via parental reports (Fenson et al., 1993). Although the original MCDI's reliability and validity have been widely acknowledged (Heilmann et al., 2005; Luyster et al.,

2007; Mancilla-Martinez et al., 2011; Mayor & Plunkett, 2011), the psychometric properties of the Trilingual MCDI for the Malaysian population has not been established. However, the MCDI was developed following a consultation from the CDI Advisory Board (Low, 2009). Low (2009) created the Trilingual MCDI that comprises 600-word items in three languages (i.e. English, Malay, and Mandarin) for Malaysian children. The 21 semantic categories (e.g. animals, vehicles, toys, food and drink, clothing, body parts, and people) of the original MCDI were retained.

In this study, the mothers indicated that all the words were understood and produced in Malay and/or English languages by their children. Although the participants were native Malay speakers, many of them also spoke in English to a certain extent due to the multilingual context of Malaysia. The receptive and expressive language scores used in this study refer to the total vocabulary or combined words in Malay and English as reported by the parents. Total vocabulary was used to fully capture the vocabulary gains of the children (Core et al., 2013) because of constant exposure to Malay and English in the children's environments.

Language Use Inventory (LUI; O'Neill, 2009)

The LUI is a parent-reported questionnaire that assesses the social communication skills of children aged 18 to 47 months old. It was originally standardised based on Northern American children's norms but has been recently translated into other languages and is used in a few countries such as the UK, Ireland, and Australia. The internal and test-retest reliabilities and discriminant and predictive validities of the LUI were well established (O'Neill, 2007, 2009). Cronbach's alpha values for all the parts and most of the subscales (except Subscales B and J) were at or above acceptable levels (.80-.99). Test-retest reliability was also high (O'Neill, 2007); all the subscales indicated significant Pearson correlations of .85 to .96 ($p < .001$) between the test and retest scores except for Subscale B ($r = .34$). A discriminant analysis revealed that children aged between 24 and 47 months with and without language delay, in particular, could be differentiated with the LUI scores as indicated by the sensitivity and specificity values of nearly 96% (Pesco & O'Neill, 2012).

The LUI consists of three parts with 14 subscales and a total of 180 questions that assessed

children's communication in different settings and their functions in daily activities. 95% of the responses to the 180 items were indicated in a forced choice format (i.e. "yes" and "no") while the remaining 5% of the responses were in a four-point Likert scale format (i.e. 1 = *not yet*, 2 = *rarely*, 3 = *sometimes*, and 4 = *often*). Part one of the LUI is related to a child's gestural communication such as the imperative use of gestures and the declarative use of pointing. Part two is related to the child's communication with words. Part three involves communication with longer sentences such as the child's use of declarative words and questions and comments about things, self, and other people.

In consultation with Daniella O'Neil, the author of the LUI, it was translated into Malay by the lead investigators of the core study. The translated instructions and items were given verbally and/or in written scripts in addition to the original online LUI form. Following the instructions of the LUI protocol, only the total score (i.e. the sum of part two and part three) was used.

Statistical Analyses

Unlike most randomised controlled trials that utilise intent-to-treat analysis to handle missing data, the data in this study were analysed based on a per-protocol analysis. This study employed a per-protocol analysis because it aimed to investigate intervention's effectiveness after the loss of participants at T1. Under the per-protocol analysis, the mothers and their children who withdrew or dropped out before and during the intervention period were excluded from the data analysis (refer to Results section for details). Since my analysis was based on a smaller sample than planned (N = 67), this study's statistical power has reduced from the intended .80 to a range of .05 to .63.

Before commencing data analysis, I assessed the distribution of gain scores using the Shapiro-Wilk test. The results are presented in Table 3.5. Among all mothers' gain scores, beliefs in family-centred intervention, join involvement activities, and scaffolding practices of the M-HMTW group were not normally distributed. Practices of mother-child interactions and conversational practices gain scores from the M-HMTW group and all the TAU group were normally distributed. Among all the child measures, social communication of the M-HMTW group; coordinated JE, total

receptive vocabulary, total expressive vocabulary, and social communication of the TAU group were not normally distributed. Supported JE, coordinated JE, total receptive vocabulary, and total expressive vocabulary of the M-HMTW group; and supported JE of the TAU met the assumptions of normality ($p < .05$). Non-parametric tests Mann-Whitney and Wilcoxon signed-ranks were performed to address my research questions.

Table 3.5

Shapiro-Wilk Test (W) of Normality of Outcome Measures (Gain Scores)

Measures (Gain Scores)	M-HMTW[1]	TAU[2]
Mother measures		
Beliefs in family-centred intervention	0.837*	0.947
Practices of mother-child interactions	0.896	0.960
a) Join involvement activities	0.803**	0.946
b) Conversational practices	0.944	0.948
c) Scaffolding practices	0.797**	0.920
Child measures		
JE		
Supported JE	0.956	0.916
Coordinated JE	0.978	0.834**
Language		
Total receptive vocabulary	0.910	0.735***
Total expressive vocabulary	0.939	0.713***
Social communication	0.865*	0.835**

Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual; JE = joint engagement. [1]$n = 14$, [2]$n = 18$.

*$p < .05$. **$p < .01$. ***$p < .001$.

To validate the success of the randomisation and homogeneity between groups, I used the Mann-Whitney test to compare baseline assessment (T1) scores between groups. There was a significant difference in four child measures, i.e. coordinating JE, total receptive vocabulary, total expressive vocabulary, and social communication between the two groups. Since this baseline imbalance could potentially affect the internal validity and data interpretation, I made an informed decision of using the gain score model to analyse the between-group differences from T1 to T2. Gain score (**Δ**) indicates the amount of change between the T1 and T2 scores. It is computed by

subtracting the score on the T1 from the T2 scores. Even though the gain score method is claimed to be unreliable by some researchers (Gupta et al., 1988; Lord, 1956), it was argued that this method produces better statistical power than raw scores and is not influenced by baseline imbalance (Kisbu-Sakarya et al., 2013; Oakes & Feldman, 2001). Meanwhile, raw scores were used to determine the within-group effects.

The analyses of intervention effects were then performed at two levels, between- and within-group comparisons. The degree of association between- or within- groups was determined through the computation of effect size (*ES*). Since the majority of the data did not have a normal distribution, the effect size estimates for the non-parametric tests were calculated using a formula proposed by Corder and Foreman (2009):

$$ES = \frac{|z|}{\sqrt{n}}$$

where |z| is an absolute value of the z-score and n is the number of matched pairs included in the analyses. The effect size ranges between 0 to 1. Corder and Foreman (2009) suggested the interpretation of ES based on Cohen's (1988) definition that effect sizes of .10, .30, and .50 are considered small, medium, and large respectively.

Chapter 4: Results

The present chapter summarises the results of the study in four sections. The first section presents the participant group characteristics at baseline, T1. The second to fourth sections discuss mother outcomes, child outcomes, and the feasibility of the intervention. The per-protocol analysis that involves only dyads who completed the interventions were applied in this study.

Baseline Measures Between Groups

Only 37 out of 59 dyads attended the pre-intervention (T1) assessment. Firstly, prior to the per-protocol analysis, the Mann-Whitney analysis was first computed on all 37 dyads who were randomised to the two intervention groups ($n_{\text{M-HMTW}} = 19$; $n_{\text{TAU}} = 18$). The Mann-Whitney analysis found no significant differences in baseline measures between the two groups in all except one baseline measure, child coordinating JE ($z = -2.412$, $p < .05$, $ES = .40$), indicating homogeneity in the other measures right after randomisation (Table 4.1). After the T1 assessment and before any interventions began, 22 more dyads withdrew their participation ($n_{\text{M-HMTW}} = 12$; $n_{\text{TAU}} = 10$). During the course of intervention, five dyads from the M-HTMW group withdrew. In total, there was a total loss of 17 participants from the M-HTMW group and a total loss of 10 participants from the TAU group. Only 32 dyads completed their respective interventions.

When the per-protocol analysis was computed on the 32 dyads who completed their interventions ($n_{\text{M-HMTW}} = 14$; $n_{\text{TAU}} = 18$), there were significant differences in most of the child measures at T1, i.e. coordinating JE, total receptive vocabulary, total expressive vocabulary, and social communication. Only the mother measures and child supported JE retain their between-group homogeneity.

The change in homogeneity of the baseline measures after the per-protocol analysis could be attributed by attrition bias or differences in attrition rates between the two groups (US Institute of Education Sciences, 2020). There was an attrition of 17 (54.8%) participants from the M-HMTW group and an attrition of 10 (35.7%) participants from the TAU group. The differences in attrition rates between the two intervention groups leads to attrition bias. Other possible reasons that might

lead to the lack of homogeneity in baseline measures are small sample size, high heterogeneity of ASD characteristics (Baker-Ericzén et al., 2007) and potential presence of comorbidity such as intellectual impairment, language impairment and/or catatonia (APA, 2013) that are beyond the investigation of this study.

In summary, a baseline imbalance between the M-HMTW and TAU was found in the majority of T1 child measures following the per-protocol analysis. The imbalance was likely associated with the higher rates of attrition in the M-HMTW group than in the TAU group. Therefore, the gain score method was used to compensate the baseline imbalance of this study (Kisbu-Sakarya et al., 2013; Oakes & Feldman, 2001).

Table 4.1

Mann-Whitney Analysis (U) of Pre-Intervention (T1) Raw Scores

	Prior to per-protocol analysis (N = 37)			Per-protocol analysis (N = 32)		
	U	*z*	*ES*	*U*	*z*	*ES*
Mother outcomes						
Beliefs in family-centred intervention	343.0	-0.551	0.09	117.5	-0.325	0.06
Practices of mother-child interactions	356.0	-0.152	0.02	117.0	-0.343	0.06
a) Join involvement activities	333.5	-0.849	0.14	95.5	-1.175	0.21
b) Conversational practices	332.0	-0.306	0.05	96.0	-1.149	0.20
c) Scaffolding practices	360.5	-0.015	0.00	112.5	-0.516	0.09
Child outcomes						
JE						
Supported JE	327.5	-0.443	0.07	104.0	-0.841	0.15
Coordinated JE	263.5	-2.412*	0.40	66.0	-2.307*	0.41
Language						
Total receptive vocabulary	287.0	-1.672	0.27	73.0	-2.013*	0.36
Total expressive vocabulary	286.5	-1.746	0.29	70.5	-2.183*	0.39
Social communication	291.0	-1.551	0.25	73.5	-1.997*	0.35

Note. JE = joint engagement. *$p < .05$.

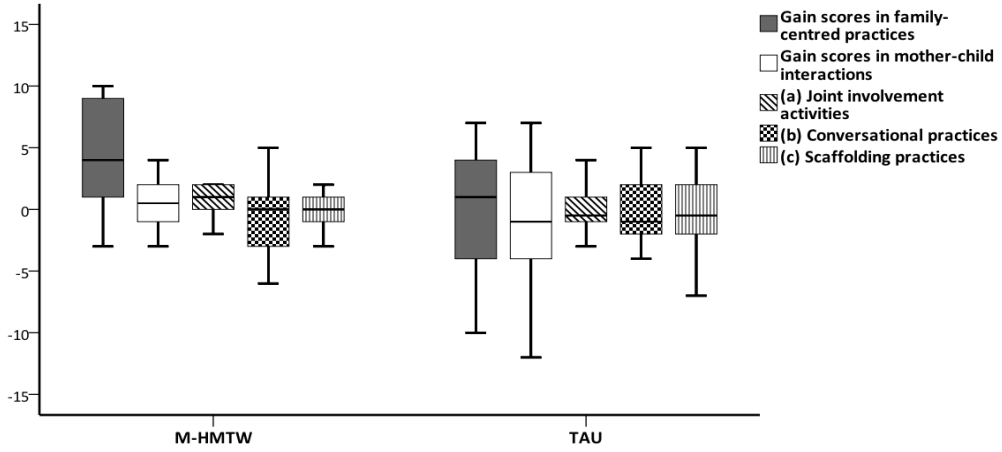
Mother Outcomes

The first research question aimed to compare the mothers' beliefs in family-centred intervention and practices of mother-child interactions between the M-HMTW and TAU interventions. Figure 4.1 shows the boxplots of gain score differences in mother measures between

the intervention groups. The gain scores were further analysed using Mann-Whitney tests and are summarised in Table 4.2.

Figure 4.1

Boxplots of Gain Score Differences in Mother Outcomes Between Groups



Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual.

Table 4.2

Mann-Whitney Analysis (U) of Between-Group Differences in Mother Outcomes (Gain Scores)

Mother Outcomes (Gain Scores)	*U*	*z*	*ES*
Beliefs in family-centred intervention	69.0*	-2.176	.38
Practices of mother-child interactions	108.0	-0.686	.12
a) Join involvement activities	88.5	-1.454	.26
b) Conversational practices	114.5	-0.440	.08
c) Scaffolding practices	118.5	-0.288	.05

Note. n = 32. *p < .05.

Between-group Differences

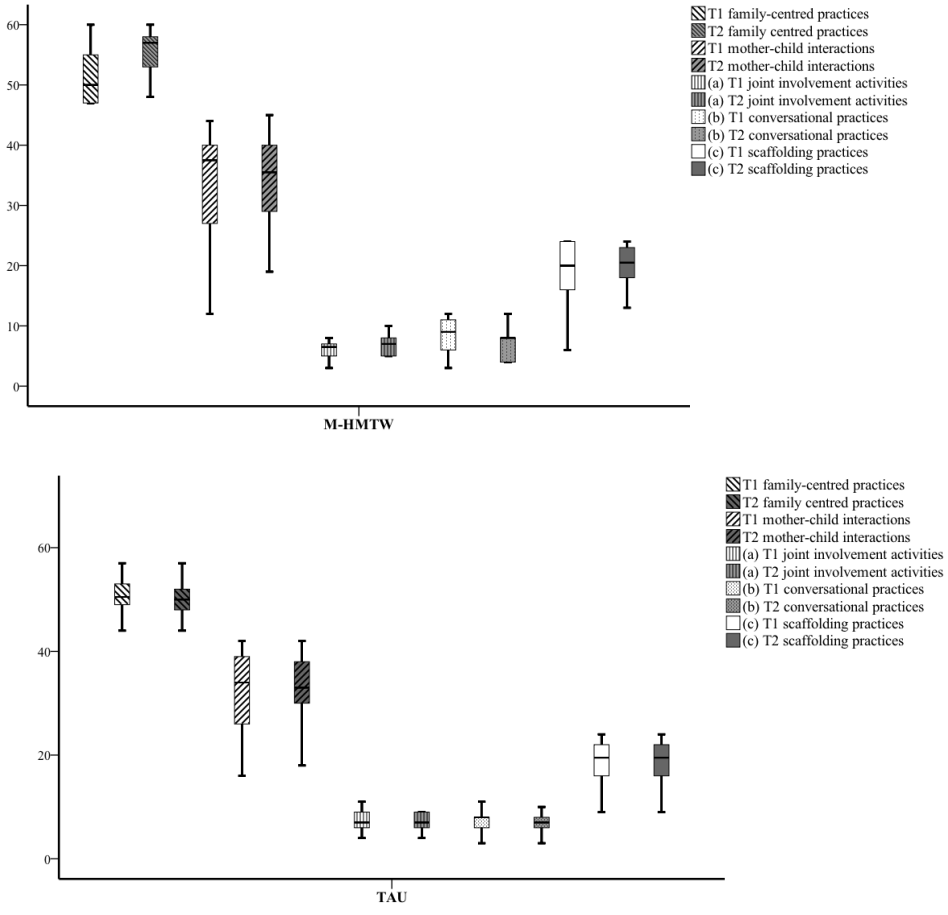
Among the mother measures, only one showed significant difference by intervention group in favour of the M-HMTW. In comparison to mothers whose children enrolled in the TAU (*n* = 18; *M* = -0.06, *SD* = 4.99), mothers in the M-HMTW (*n* = 14; *M* = 5.36, *SD* = 7.27) reported a larger change in their beliefs in family-centred intervention, *U* = 69.0, *p* = .030, *ES* = .38. Effect size was medium (*ES* = .30 - .50). There was, however, no significant differences in between-group gain scores in the mothers' self-reported mother-child interactions, i.e. join involvement activities, conversational practices, and scaffolding practices.

Within-group Differences

Figure 4.2 shows the boxplots of mother raw scores when compared within the M-HTMW and within the TAU groups. Table 4.3 shows the Wilcoxon Signed-Ranks analysis of the changes in mothers' outcomes, from T1 to T2, within each intervention group. The Wilcoxon Signed-Ranks analysis revealed that the mothers who completed the M-HMTW, had significantly higher raw scores in their beliefs in family-centred intervention at T2 than T1 (z = -2.609, p = .009, ES = .49) but there were no other statistically significant difference among the other measures. Estimate of the effect size was borderline large (ES > .50) for the M-HMTW mothers' beliefs in family-centred intervention. Mothers in the TAU group did not show any significant change in any of the mother measures.

Figure 4.2

Boxplots of Mother Outcomes (Raw Scores) Within the Malay-Based Hanen More Than Words (M-HMTW) and Within the Treatment-as-usual (TAU)



Note. JE = Joint engagement, T1 = Pre-intervention, T2 = Post-intervention.

Table 4.3

Wilcoxon Signed-Ranks Analysis (Z) of Within-Group Differences in Mother Outcomes (Raw Scores)

	M-HMTW[1]		TAU[2]	
	z	*ES*	*z*	*ES*
Beliefs in family-centred intervention	-2.609[a]**	.49	0.000[b]	.00
Practices of mother-child interactions	-0.553[a]	.10	-0.414[b]	.07
a) Join involvement activities	-1.675[a]	.32	-0.169[b]	.03
b) Conversational practices	-1.208[a]	.23	-0.521[b]	.09
c) Scaffolding practices	-0.462[a]	.09	-0.267[b]	.04

Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual. [1]*N* = 28, [2]*N* = 36, *N* = total observation. ***p* < .01.

[a]Based on negative ranks (i.e. T2 < T1), [b]Based on positive ranks (i.e. T2 > T1).

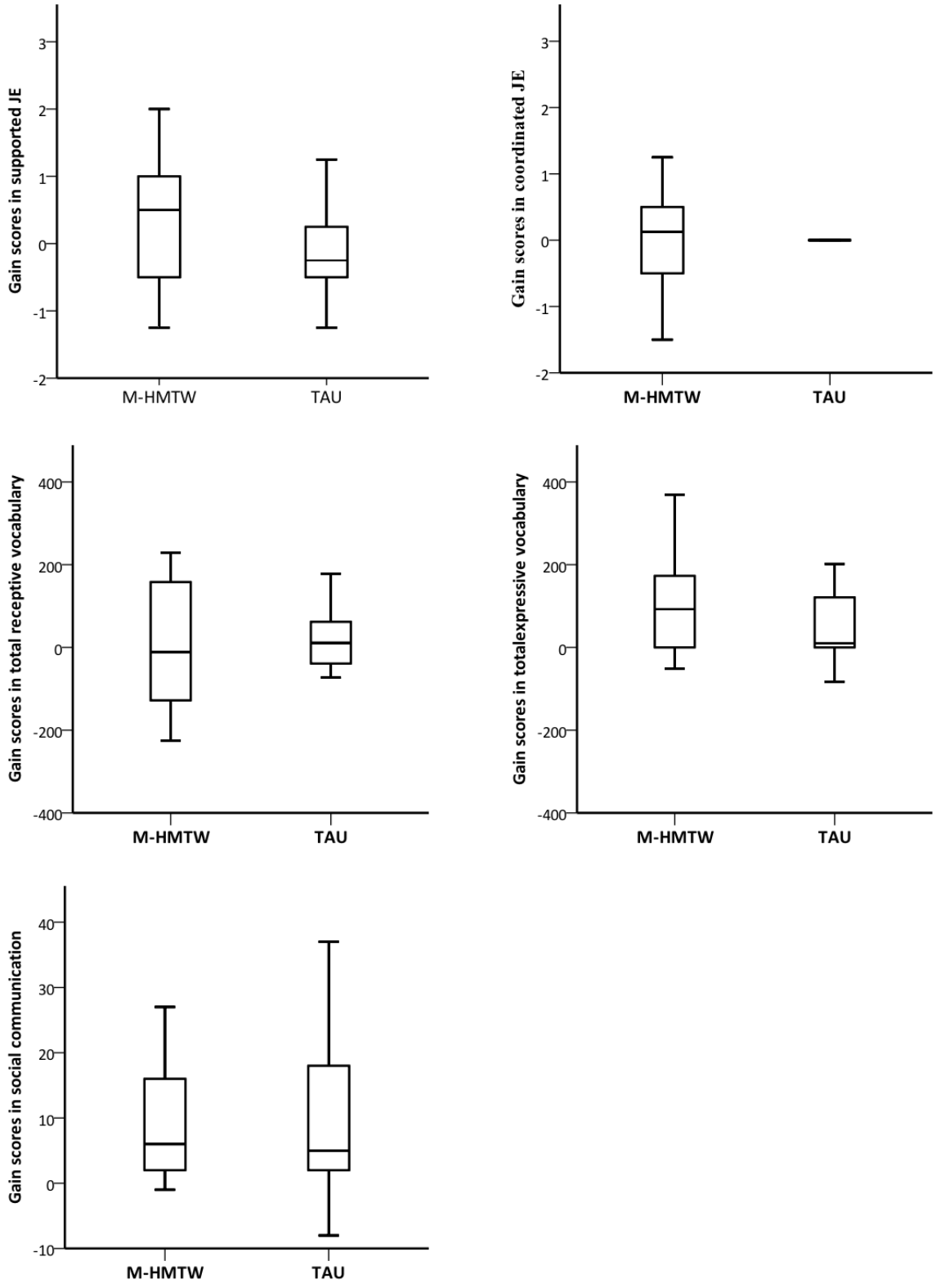
Child Outcomes

Between-group Differences

The second research question aimed to compare differences in child outcomes between the M-HMTW and TAU intervention groups. The boxplots of gain score differences in the child measures between groups are shown in Figure 4.3. Although the children from both groups started with four significantly different baseline measures (i.e. coordinating JE, total receptive vocabulary, total expressive vocabulary, and social communication), their gain scores (T2) did not differ significantly (refer Table 4.4). A small effect was found in children's supported JE and total expressive vocabulary. Therefore, the null hypothesis for the second research question was retained.

Figure 4.3

Boxplots of Gain Score Differences in Child Outcomes Between Groups



Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual.

Table 4.4

Mann-Whitney Analysis (U) of Between-Group Gain Score Differences in Child Outcomes

Child Outcomes (Gain Scores)	*U*	*z*	*ES*
JE			
Supported JE	99.0	-1.032	.18
Coordinated JE	114.5	-0.450	.08
Language			.
Total receptive vocabulary	125.0	-0.038	.01
Total expressive vocabulary	94.5	-1.201	.21
Social communication	122.0	-0.152	.03

Note. JE = joint engagement. $n = 32$. *$p < .05$

Within-group Differences

Following the significant heterogeneity in many child measures at T1 and the lack of between-group differences in most of the measures, I further analysed the within-group differences of the child outcomes using their raw scores. The analyses were similar to non-equivalent quasi-experiments and were done in order to explore changes or improvements that each group of participants made from T1 to T2. Although non-equivalent quasi-experiment analyses have a lower internal validity than randomised controlled trial, is not a "gold standard" research design for evaluating intervention effects, and cannot examine the potential cause-and-effect associated with the M-HMTW/TAU intervention, it can still provide scientific validity. Bärnighausen et al. (2017) argued that quasi-experimental studies produce higher external validity because the generated data capitalise on natural occurence in real-life settings with limited researcher control and unforeseen constraints. For this purpose, Wilcoxon Signed-Ranks analyses were done and the results obtained are set out in Table 4.5.

Table 4.5

Wilcoxon Signed-Ranks Analysis (Z) of Within-Group Differences in Child Outcomes (Raw Scores)

	M-HMTW[1]		TAU[2]	
	z	*ES*	*z*	*ES*
JE				
Supported JE	-1.008[a]	.19	-0.548[b]	.09
Coordinated JE	-0.355[a]	.07	-0.142[a]	.02
Language				
Total receptive vocabulary	-0.471[a]	.09	-0.588[a]	.10
Total expressive vocabulary	-2.667[a] **	.50	-1.915[a]	.32
Social communication	-3.113[a] **	.59	-2.766[a]**	.46

Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual, JE = joint engagement. [1]*N* = 28, [2]*N* = 36, *N* = total observation. **$p < .01$.

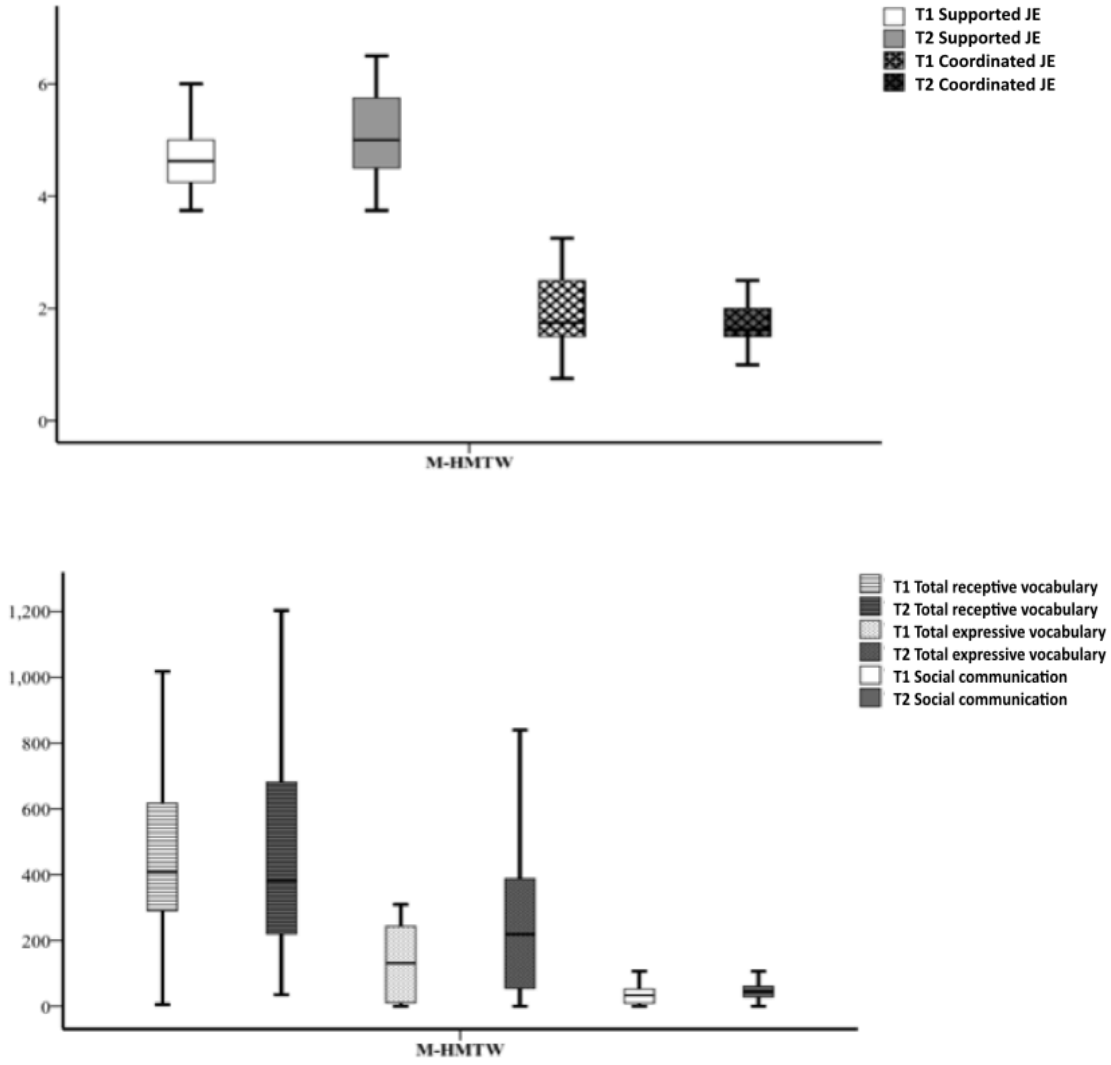
[a]Based on negative ranks (i.e. T2 < T1), [b]Based on positive ranks (i.e. T2 > T1).

Within-M-HMTW. Figure 4.4 shows the boxplots of raw scores of child measures within the M-HMTW intervention group. The Wilcoxon Signed-Ranks analysis indicated that the children within the M-HMTW group had significantly higher raw scores at T2 than T1 in two measures: (a) total expressive vocabulary (z = -2.667, p = .008, *ES* = .50) and (b) social communication (z = -3.113, p = .002, *ES* = .59). The effect sizes of the two outcomes were large (ES ≥ .50). There was no significantly change in three child outcomes, i.e. supported JE, coordinated JE, and total receptive vocabulary.

Within-TAU. Figure 4.5 shows the boxplots of child outcomes (raw scores) within the TAU intervention group. The Wilcoxon Signed-Ranks analysis revealed no significant change in all child outcomes except social communication scores. The TAU children's social communication raw scores at T2 were significantly higher than T1 (z = -2.766, p = .006, *ES* = .46) with a moderate effect. In fact, they (M = 13.00, SD = 20.00) had better improvement in their social communication's gain scores in comparison with children in the M-HMTW (M = 9.00, SD = 9.00). The effect sizes of total expressive vocabulary and total receptive vocabulary were borderline medium (*ES* = .32) and small (*ES* = .10), respectively.

Figure 4.4

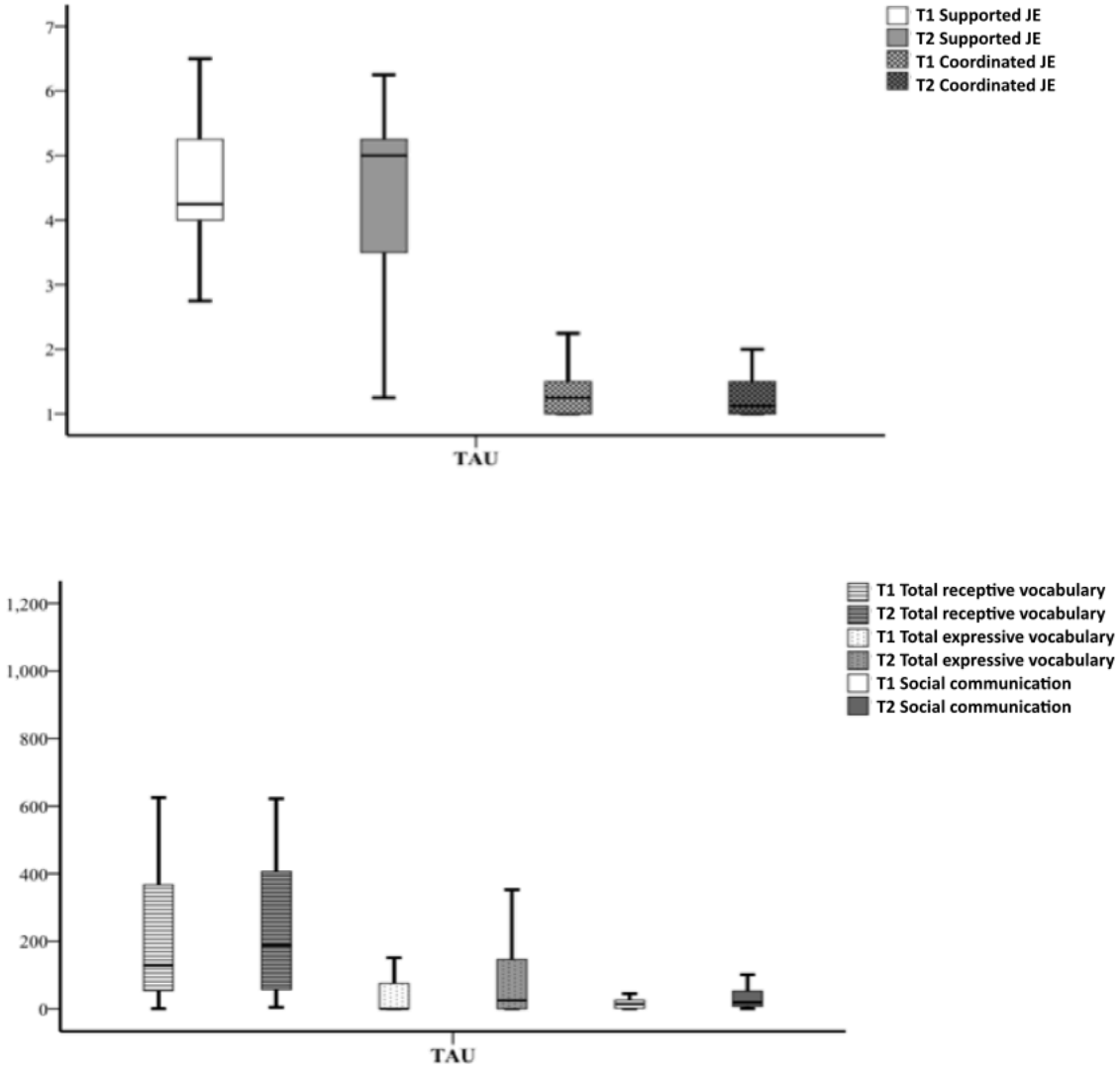
Boxplots of Child Outcomes (Raw Scores) Within the Malay-based Hanen More Than Words (M-HMTW)



Note. JE = Joint engagement, T1 = Pre-intervention, T2 = Post-intervention.

Figure 4.5

Boxplots of Child Outcomes (Raw Scores) Within the Treatment-as-usual (TAU)



Note. JE = Joint engagement, T1 = Pre-intervention, T2 = Post-intervention.

In a summary, based on between-group analyses, mothers from the M-HMTW showed significantly higher beliefs in family-centred intervention than mothers from the TAU after the intervention, with a medium effect size. There were no main effects of M-HMTW on either mothers' practices of mother-child interactions or all child outcomes. Within the M-HMTW, the mothers significantly increased their raw scores in their beliefs in family-centred intervention at T2 while the

children significantly increased their total expressive vocabulary and social communication raw scores at T2. Effect sizes for these measures ranged from borderline large to large. On the other hand, within the TAU, the only significant increase observed was the children's social communication at T2.

Feasibility

Lastly, the third research question aimed to examine the potential feasibility of implementing the M-HMTW intervention within the Malaysian public health care system, an alternative to the current TAU intervention. The feasibility of the M-HMTW intervention was examined based on the: (a) attrition rates and (b) ten dimensions of feasibility following Gadke et al.'s (2021) protocol.

Attrition Rates

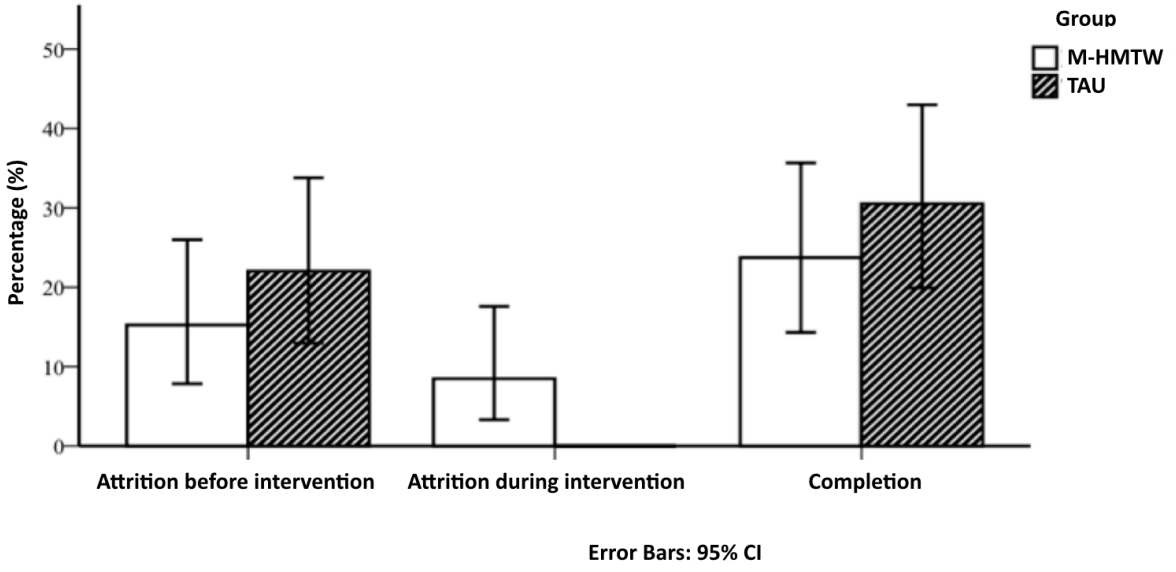
Computation of attrition rates was done: (a) right after randomisation of the 59 participants and before T1 assessment, and (b) during the course of intervention. Figure 4.6 shows the attrition and completion rates between the M-HMTW and TAU groups. Before intervention began, the total attrition rates in both groups were high but homogenous, except child coordinating JE. Once interventions commenced, only the M-HMTW participants withdrew. Overall, the total attrition rate was 45.8%. 28.8% or 17 withdrawal altogether from the M-HMTW group and 16.9% or 10 withdrawal altogether from the TAU participants. The differential attrition is 11.9%.

A comparison of the attrition rates between the two groups and two sites after randomisation of participants and before intervention started was computed. The Chi-square test did not show any statistical significant differences between intervention groups ($\chi^2(1, 59) = 0.603$, $p = .44$, $\varphi = .10$) and between intervention Site A and Site B ($\chi^2(1, 59) = 0.603$, $p = .44$, $\varphi = -.10$). As stated in Chapter 3, the reasons for participant withdrawal at T1 include inability to commit ($n_{\text{M-HMTW}} = 4$; $n_{\text{TAU}} = 2$), no childcare support ($n_{\text{M-HMTW}} = 2$; $n_{\text{TAU}} = 0$), long travelling distance to intervention site ($n_{\text{M-HMTW}} = 2$; $n_{\text{TAU}} = 1$), etc.

Then, the attrition rates during the course of intervention between two groups and two sites were compared. The Fisher's Exact test indicated that the participants of the M-HMTW group had a significantly higher attrition during the course of intervention than the participants of the TAU group ($F^2(1, 37) = 7.406$, $p = .046$, $\varphi = -.39$). However, there was no significant difference in the attrition rate between the two sites of intervention ($F^2(1, 37) = 2.402$, $p = .18$, $\varphi = -.25$). This lack of attrition from the TAU group during intervention was because the TAU involved a shorter intervention time (2.25 hours), and a missed intervention session was always replaced by another one later. The M-HMTW participants discontinued the intervention for a variety of reasons, including inability to commit towards the intervention ($n = 3$), no childcare support ($n = 1$), and mother's health issue ($n = 1$).

Figure 4.6

Attrition and Completion Rates Between Groups



Note. M-HMTW = Malay-based Hanen More Than Words, TAU = treatment-as-usual. CI = confidence interval.

Attrition Bias. Due to high attrition rates in the study, it was essential to determine the potential of attrition bias. Attrition bias is a type of selection bias that arises from systematic differences caused by loss of participants in the intervention and comparison groups (Nunan et al.,

2018). To estimate a study's attrition bias, (a) overall attrition and (b) differential attrition were calculated. Overall attrition is the total attrition for all study participants, whereas differential attrition is the difference in attrition rates between-group.

This study's overall and differential attritions were 45.8% and 11.9% respectively. According to the What Works Clearinghouse's (WWC) attrition standard (WWC, 2020, pp. 10 & 12), the acceptable differential attrition for an overall attrition of 45.0% is in the range of 1.8 - 4.9%, whereas for an overall attrition of 46.0% is in the range of 1.6 - 4.6% (Table 4.6). Hence, the result comfirmed that the study had a high attrition bias and the imbalanced attrition between groups was because of the M-HMTW.

Table 4.6

What Works Clearinghouse's (2020) Attrition Standard

Overall attrition (%)	Range of acceptable differential attrition (%)		
45.0	1.8	-	4.9
46.0	1.6	-	4.6

All in all, there was a significant high attrition in the M-HMTW than the TAU during the course of intervention. It eventually led to high attrition bias and heterogeneity in majority of child measures at baseline, T1. These could possibly influence potential improvement and outcomes since the study employed per-protocol analyses. Those participants who dropped out were not included in the final analyses. Thus, further investigations for the attrition patterns were conducted to understand how participant demographics and outcome measures at T1 influence the attrition within the M-HMTW. Statistical analyses found homogeneity in their demographics and clinical characteristics at T1 except children's T1 total receptive vocabulary, $U = 12.0$, $p = .03$, $r = .0.49$ (refer Table 4.7). Children with a higher total receptive vocabulary score at T1 tended to complete the M-HMTW than those with a lower score.

Table 4.7

Comparison of the Malay-based Hanen More Than Words (M-HMTW) Participants' Outcome Measures at Pre-Intervention (T1) Assessment Between Those who Completed the M-HMTW and who Attrited During Intervention

	M-HMTW (n = 14)			U
	M	*SD*	Range	
Mother Measures at T1				
Beliefs in family-centred intervention				U = 31.5, p = .74, r = .0.08
Completed the M-HMTW [1]	50	7	32 - 60	
Attrited during intervention [2]	49	2	46 - 51	
Practices of mother-child interactions				U = 23.0, p = .27, r = .0.26
Completed the M-HMTW [1]	33	10	12 - 44	
Attrited during intervention [2]	30	4	25 - 35	
a) Join involvement activities				U = 23.5, p = .28, r = .0.25
Completed the M-HMTW [1]	6	2	3 - 8	
Attrited during intervention [2]	7	2	6 - 10	
b) Conversational practices				U = 18.0, p = .11, r = .0.36
Completed the M-HMTW [1]	8	3	3 - 12	
Attrited during intervention [2]	6	1	5 - 7	
c) Scaffolding practices				U = 22.5, p = .24, r = .0.27
Completed the M-HMTW [1]	19	6	6 - 24	
Attrited during intervention [2]	17	4	12 - 22	
Child Measures at T1				
Supported JE				U = 21.0, p = .19, r = .0.30
Completed the M-HMTW [1]	4.77	.72	3.75 - 6.25	
Attrited during intervention [2]	4.15	.99	3.00 - 5.50	
Coordinated JE				U = 30.0, p = .62, r = .0.11
Completed the M-HMTW [1]	1.93	.74	.75 - 3.25	
Attrited during intervention [2]	2.20	1.14	1.00 - 3.50	
Total receptive vocabulary *				U = 12.0, p = .03, r = .0.49
Completed the M-HMTW [1]	461	311	5 - 1017	
Attrited during intervention [2]	182	122	0 - 311	
Total expressive vocabulary				U = 15.0, p = .06, r = .0.43
Completed the M-HMTW [1]	168	178	0 - 666	
Attrited during intervention [2]	24	25	0 - 50	
Social communication				U = 16.5, p = .09, r = .0.39
Completed the M-HMTW [1]	40.8	36.4	0 - 107	
Attrited during intervention [2]	13.6	14	3 - 37	

Note. M-HMTW = Malay-based Hanen More Than Words; T1 = Pre-intervention; JE = joint engagement.

Based on intent-to-treat analysis. [1]n = 14, [2]n = 5. *p < .05.

In summary, this study had a high attrition rate with a high attrition bias, a type of selection bias, which had altered the effects of participant randomisation. Both intervention groups shared similar attrition rates before intervention started but not during intervention started. Only participants from the M-HMTW dropped out during intervention, before completion. Generally, those M-HMTW particpants who dropped out had a lower total receptive vocabulary score at T1 than those completed the M-HMTW.

Ten Dimensions of Feasibility (Gadke et al., 2021)

According to Gadke et al. (2021), a study of feasibility examines multiple variables to evaluate the effectiveness of an intervention as a preparation for a full-scale evaluation. A feasibility study provides insights into the critical elements of the intervention, identifies the infrastructure, professional development, or resources to implement the intervention, and ascertains the practicality and usability of the intervention. The feasibility of the M-HMTW was reviewed following Gadke et al.'s (2021) feasibility protocol which comprises ten dimensions: (a) recruitment capability, (b) data collection procedures, (c) design procedures, (d) social validity, (e) practicality, (f) integration into existing systems, (g) adaptability, (h) implementation, (i) effectiveness, and (j) generalisability. The feasibility questions were answered and the results were summarised in Table 4.8. Of the ten dimensions, the study met the benchmark for practicality, adaptability, and implementation. The study partially met the criteria for data collection, design procedure, social validity, integration, and effectiveness, and did not meet the benchmark for recruitment capability and generalisability.

Table 4.8

The Ten Dimensions of Feasibility, Feasibility Questions, and Feasibility Results

Ten Dimensions	Feasibility Question	Feasibility
a) Recruitment capability	Can participants who will benefit from and who will implement the intervention be identified?	No. The study targeted a sample size of 67 dyads. Out of 330 mothers who expressed interest, the study managed to recruit 59 dyads who met the inclusion criteria. Further participant withdrawal resulted in only 32 participants at T2 ($n_{\text{M-HMTW}}$ = 14; n_{TAU} = 18).
b) Data collection	Are the data collection procedures appropriate?	Yes. Data were collected through self-reported parental questionnaires (i.e. mothers' beliefs in family-centred intervention, practices of mother-child interactions) and expert rating of the children's behaviours (i.e. supported JE, coordinated JE) using the JERI scale. Administration of procedures were straightforward and easily replicable.
	Are outcome measures appropriate and sensitive to change?	Partial. Group differences were found only in outcomes measured using the Parental Involvement in Speech Intervention Survey (Pappas et al., 2008), Trilingual MCDI (Low, 2009) and LUI (O'Neill, 2009).
c) Design procedures	Is research design appropriate and sensitive to evaluating change?	Partial. Two-time point assessments, pre- and post-intervention were conducted. T2 assessment was conducted immediately after the intervention. Although a comparison could be made between baseline and skill development post-intervention, the mothers might require more time to achieve intervention fidelity, and this might have subsequently affected their effectiveness as co-therapists to improve their children's developmental skills.

d) Social validity (Acceptability)	Do SLTs and participants perceive the M-HMTW intervention as appropriate, reasonable, fair, and potentially effective?	Partial. Attritian rates were high before the M-HMTW intervention began (*n* = 12; 20.3%) and during the course of intervention (*n* = 5; 8.5%). Mothers who completed the M-HMTW showed a positive change in their beliefs in family-centred intervention.
e) Practicality	Can the M-HMTW intervention be implemented with available resources, time, training, and materials?	Yes. The HMTW certified SLTs are equipped with the knowledge and skills through prior training, and materials to carry out the intervention. The physical space for training necessitates a room that can comfortably accommodates the size of the group. Cost of intervention in this study was borne by the research project but in clinical settings. In a clinical setting, the cost of intervention is minimal at Malaysian public hospitals. At the minimum, the participants would need to fork out the travelling expenses, time and commitment to attend their assigned intervention. In private settings, the intervention cost is relatively high.
f) Integration	Can the HMTW/M-HMTW intervention align with the infrastructure of the setting or system?	Partial. The family-centred, early language, and parental training principles and strategies of the M-HMTW/HMTW align with the evidence-based practices recommended in early language intervention training for SLTs in Malaysia and internationally. However, this alignment is not sufficient to sustain all parents' commitment towards completing the intervention. Issues such as lack of time-off employment to attend intervention sessions that were held on weekdays, and caregiving support during weekends deterred the parents from completing the intervention.

g) Adaptability	Is there sufficient flexibility built into the M-HMTW intervention procedures to accommodate diverse needs?	Yes. The M-HMTW intervention was for mothers of preschool children with all levels of ASD, and for those who might experience language barriers with the original HMTW in English. However, there was rigidity in the logistics such as timing of the M-HMTW at Site B, a government hospital, and the location of both training sites.
h) Implementation	Are SLTs able to implement the M-HMTW intervention with fidelity?	Yes. Qualified SLTs who are certified by the Hanen Centre, can conduct the M-HMTW intervention. To date, according to the Hanen Centre's web directory (2020), there are 41 HMTW-certified SLTs in Malaysia. The two SLTs who led the M-HMTW were qualified Malaysian SLTs and certified in HMTW. They were able to comply with intervention fidelity and the conduct of HMTW, i.e. content, activities, and group size.
i) Effectiveness	Is there preliminary evidence of potential for bringing about positive change?	Partial. The study found a positive change in the mothers' beliefs in family-centred intervention, post-intervention. No main effects of the M-HTMW were found on all child outcome measures, immediately post-intervention.
j) Generalisability	Can the M-HMTW intervention procedures generalise to non-intervention settings, over time and with diverse participants?	No. Although the intervention sites simulate real-life training sessions and the instruments were intended to measure generalised skills, i.e. those not directly taught by the intervention and measured in a context other than the intervention context (Yoder et al., 2013), the mothers and children did not show significant changes in almost all measures.

Chapter 5: Discussion

This chapter aims to highlight and discuss the key findings of the study. The present study was designed to determine the effects of the M-HMTW on mothers' beliefs in family-centred intervention and practices of mother-child interactions, as well as changes in the children's JE, language, and social communication skills between two types of interventions (i.e. M-HMTW and TAU) within Malaysian Malay families of preschool children with ASD. The M-HMTW is a PMI that was translated from the English-based HMTW programme (Sussman et al., 2016). The TAU replicated the service delivery model for language intervention provided by the majority of Malaysian public hospitals. Public hospitals are currently the largest proportion of speech-language intervention providers in Malaysia. Both interventions were completed within four months. Additionally, the feasibility of implementing the M-HMTW among Malay mothers of children with ASD was examined.

This study utilised a randomised controlled trial experimental study. Careful steps were planned and employed to implement participant randomisation. For instance, an anonymous code was assigned to each participant; the principal investigator, who had no contact with the participants did the randomisation with the Research Randomizer software (Urbaniak & Plous, 2013); the interventions were conducted at two sites, and raters of the CPP were blind to the study. Per-protocol analysis of baseline group characteristics at T1 found homogeneity in all participant demographics, all mother measures and only one child measure, the children's supported JE. There were significant group differences in four other child measures: coordinated JE, total receptive vocabulary, total expressive vocabulary, and social communication.

The initial randomisation failed to produce groups that were similar in the intended child measures at T1. Despite efforts and careful steps to mitigate confounding and selection bias, heterogeneity in child measures were still present between groups. This heterogeneity was potentially confounded by high attrition (WWC, 2020) and attrition bias (US Institute of Education Sciences, 2020) after randomisation of participants Additionally, child factors such as the inherent

heterogeneity of ASD characteristics (Baker-Ericzén et al., 2007) and other undiagnosed comorbidities of intellectual impairment, language impairment and/or catatonia (APA, 2013) could not be controlled in this study.

Mother Outcomes

To date, no study has investigated intervention effects on parents' beliefs in family-centred intervention. Comparisons of mothers' beliefs in family-centred intervention between the M-HMTW and TAU groups at T2 and within each group from T1 to T2 shed light on the extent to which cultural beliefs change after the mothers attended their assigned intervention. Prior to being assigned to the M-HMTW or TAU, there were no significant group differences in the mothers' beliefs in family-centred intervention, an indication that all mothers shared similar beliefs related to the intervention approach, i.e. a tendency to prioritise therapist-centredness (M-HMTW: *M* = 50, *SD* = 7; TAU: *M* = 50, *SD* = 3). When responding to the items in the questionnaire at T1, mothers in both groups generally disagreed that they should have the final say on their child's intervention goals and activities, agreed they did not have the knowledge to determine their children's intervention goals, agreed that their SLTs' choice of intervention method was the best option for their children even if they did not prefer that option, agreed that intervention sessions should just focus on their children, and agreed that the SLTs should work directly with their children while the parents observe the session. It is not surprising that the mothers in this study had similar baseline scores and beliefs because they shared the same cultural background. These beliefs were also reported by Joginder Singh et al.'s (2011) comparison between Malaysian and Australian parents who attended early language intervention with an SLT.

According to Joginder Singh et al. (2011), in comparison with Australian parents, Malaysian parents usually played a passive role by observing their child's intervention instead of contributing to hands-on participation during intervention sessions. Joginder Singh et al. (2011) also reported that Malaysian mothers believed that language intervention should focus mainly on their child. These culture-specific practices could have contributed to the mothers' tendency to favour a therapist-

centred style of intervention. Other local Malaysian studies have argued that the Malay culture generally values hierarchical and patriarchal social organisation (Keshavarz & Baharudin, 2009), a practice which may have contributed to the mothers' beliefs that only the professional or the SLT is qualified or in a position to determine their child's intervention goals. Their lack of engagement may be attributed by inadequate empowerment to improve their child's developmental skills (Gibson et al., 2020), which was reflected in their self-reported questionnaires used in this study.

Following intervention, only mothers from the M-HMTW group showed a significant gain in their beliefs towards family-centred intervention. The effect size was medium. This finding shows that the short-term M-HMTW shifted the mothers' beliefs from therapist-centredness to family-centredness. Family-centredness is an essential element in the implementation of PMI, a new intervention approach to many Malaysian parents. Although I am not able to make a comparison with any past study about how much parental beliefs in family-centred intervention influence intervention effects, past research demonstrates that family-centred practices directly associate with self-efficacy beliefs and parenting competence and confidence (Dunst et al., 2007; Dunst & Dempsey, 2007; Mas et al., 2019). Parental beliefs in family-centred intervention also have indirect effects on parent-child interactions and child development (Trivette et al., 2010). Thus, the principles of the M-HMTW that emphasise parental involvement (Sussman et al., 2016), trains parents as the agents of change, and systematically teaches parents to be responsive had raised the awareness of the mothers in this study about the importance of family-centredness. By embracing family-centred intervention, the partnership between parents and the SLTs is likely to be enhanced.

With regard to the mothers' practices of mother-child interactions, the study did not find statistically significant differences both between- and within- groups. However, there were medium effect sizes within the M-HMTW mothers' practices of mother-child interactions while the TAU group had negligible effect sizes for the same. Mothers from both intervention groups generally reported that "sometimes", they had joint involvement activities (e.g. going to the park, playing or reading a book) and used conversational practices (e.g. provide language stimulation) with their

children. Meanwhile, they "very often" implemented scaffolding practices with their child (e.g. expansion and follow-in questions). These findings contradicted with Oono et al.'s (2013) meta-analyses where robust effects was found on improved parent-child interaction patterns (standard mean difference = .41-.90). There may be two issues that account for this study's lack of intervention effects on the mothers' interaction practices with their children: (a) sensitivity of instrument and (b) time factor.

The first issue that could have contributed to the lack of differences in the mothers' practices of mother-child interactions is the sensitivity of the instrument used. The self-reported questionnaire that was used in the study was originally designed to study cross-cultural differences in beliefs and practices concerning mother-child discourse between Indian and Euro-Canadian mothers (Simmons & Johnston, 2007). The questionnaire is sensitive to capture between culture differences in cross-sectional studies, but may not be sensitive enough to capture finer differences within the same culture and within a short intervention period. For measures like mother-child interaction practices, perhaps direct observational assessment, behaviour-coding analyses (Mas et al., 2019; Yoder et al., 2018), and technology-based automated speech analysis software (Newbury & Sutherland, 2020; Wang et al., 2020) that use the same operational definitions for each behaviour measured, may yield higher accuracies in measuring the mothers' interactional practices with their children.

The second plausible issue for the lack of intervention effects on the mothers' practices of mother-child interactions is related to time influence. A randomised controlled trial of the HMTW by Carter et al. (2011) also reported no effects on parental responsivity, immediately post-intervention. Since PMIs require parents to be co-therapists and apply interaction and language facilitation strategies to promote their children's development, Rogers et al. (2019) argue that parents require a window of time to achieve and sustain good fidelity of intervention implementation. Additionally, as Malaysian parents generally conform to the Asian culture that prioritise hierarchical and patriarchal social structure (Keshavarz & Baharudin, 2009), their beliefs may not fully conform to all practices of

PMIs. Shamsudin (2018) found that Malaysian parents reported doubt, had difficulty following their children's lead and did not know how to play with their children with ASD. Therefore, the Malay cultural elements mentioned above may render Malay mothers slightly more resistant to change than parents from cultures that highly conform to family-centredness. Malay parents may in general need extra time to learn and master interaction and language facilitation strategies that were introduced in the M-HMTW. Leung et al. (2009) revealed that Hong Kong parents took a slightly longer time than Western parents in mastering the skills taught in the Parent-Child Interaction Therapy (PCIT), a type of PMI. The PCIT therapy sessions were conducted weekly for approximately an hour each. The Hong Kong parents in Leung et al.'s (2009) study took an average of 10 to 20 sessions but some took more than 20 sessions to master specific skills such as Child Directed Interaction and Parent Directed Interaction. Thomas et al. (2017) found that Western parents took only an average of 12 sessions to master those skills. While there is limited evidence that demonstrates the duration that parents need to master parent-child interaction skills, Leung, et al.'s (2009) finding provides preliminary support that mothers from a culture that is inclined towards therapist-centred intervention may require a wider window of time to change their culture-specific parent-child interaction patterns and achieve intervention fidelity.

In summary, the present study suggests that the M-HMTW has positively shifted the mothers' beliefs from therapist-centred to family-centred intervention. But the capacity of the M-HMTW in improving the Malay mother-child interaction practices could not be ascertained in this study. Two issues, (a) sensitivity of instrument, and (b) time factor could have affected the lack of change in the mothers' conversational practices with their children. The two issues arise here would need further investigation in future studies.

Child Outcomes

Between-group Difference

Contrary to expectations, this study did not find a significant between-group difference in all child outcomes. Trivial effect sizes were found in supported JE and total expressive vocabulary. This finding is similar to systematic reviews (Beaudoin et al., 2014; Binns et al., 2019) and meta-analyses (Nevill et al., 2018; Oono et al., 2013) that generally show inconclusive or small effect sizes on child developmental outcomes within a short period of time. Those child developmental outcomes include receptive vocabulary (Heidlage et al., 2020; Roberts & Kaiser, 2011), expressive vocabulary (Roberts & Kaiser, 2011; Te Kaat-van den Os et al., 2017), communication (Beaudoin et al., 2014), and social communication (Nevill et al., 2018).

A possible explanation for the lack of intervention effects in the child outcomes is the mothers' skill mastery. While PMIs empower parents to be co-therapists to mediate their children's intervention directly, the mothers in the M-HMTW group did not show positive changes in their parent-child interaction practices. Although the lack of changes in the mothers' practices of mother-child interactions could be attributed by factors such as sensitivity of instrument and time factor, it is only logical that improvements in child outcomes are facilitated by the mothers' mastery of the taught interaction and language facilitation strategies, or mothers' intervention implementation fidelity. Thomas et al.'s (2017) meta-analysis suggests that PCIT studies generally produce strong child effects when parents meet mastery criterion by progressing from one level to a higher level, and subsequently completing the targeted intervention with a full mastery of the skills. Thomas et al.'s (2017) analysis is further confirmed by Rogers et al. (2019) and Binns et al. (2019). Rogers et al. (2019) found a positive correlation between parent-child interaction skills and children's rate of improvement in 12-week low-intensity PMIs for children with ASD. Besides, Binns et al.'s (2019) systematic review of six developmental social-pragmatic based PMIs suggest that positive child outcomes in responding to PMIs are predicted by parent fidelity (Casenhiser et al., 2015) and are associated with parental responsivity (Mahoney & Solomon, 2016) and synchronous behavior

(Pickles et al., 2015). Thus, it is argued that children are considered as receiving the full dosage of PMIs only after their mothers have made positive changes, have achieved and sustained good fidelity of intervention implementation on their own (Rogers et al., 2019).

Another possible explanation for the lack of significant changes in the child outcomes might relate to the child baseline characteristics. A past HMTW's randomised controlled trial by Carter et al.'s (2011), also found no main effects on all children's communication outcomes, i.e. initiating JA, initating behaviour requesting, frequency of intentional communication, and non-verbal communication, both immediately and five months post-HMTW. Carter et al. (2011) however found that child engagement (i.e. object interest) at baseline moderated their communication gains 5-months post-HMTW. Children with low initial object interest showed improvement in communication outcomes. Adamson et al. (2009, 2019) further argued that parents play an important role in scaffolding JA when the children with ASD are mostly unengaged and focused mainly on objects. In my study, a comparison between children with high and low object engagement could not be statistically analysed because the small sample size of the participants at T2 did not permit differentiation of the child baseline characteristics and exploration of intervention moderators. The role of object engagement in mediating the child outcomes warrant future investigation.

Just like the mothers' interactional practices with their children, the lack of intervention effects on the child outcomes might also be related to time factor. Since the T2 assessment was conducted immediately after the completion of intervention (i.e. within a month post-intervention), and the M-HMTW is a low-intensity PMI that typically comprises only a total of 23 hours over four months, the participants most likely did not have sufficient time to develop desirable intervention effects that the current instruments could detect (Warren et al., 2007). Nevill et al.'s (2018) meta-analysis of PMIs for children with ASD reported that intervention intensities that range from two to 104 hours showed either small effect sizes or inconsistent child outcomes. Wolstencroft et al.'s (2018) systematic review also suggested that the effect sizes of social skill interventions for children

with ASD are influenced by the intensity or duration of intervention. Therefore, future studies should also focus on the longitudinal intervention effects on children with ASD.

Within-group Differences

The lack of intervention effects in the target measures prompted a further examination of how mothers and children within each intervention group responded to their respective intervention. Thus, mothers' and children's raw scores at T1 and T2 were compared via within-group analyses. These comparisons are interpreted with caution as the analyses mimic the quasi-experiment study, which produces less robust findings. Additionally, a causal relationship between measures and the targeted intervention group could not be established. The following paragraphs discuss the within-group differences found in both the M-HMTW and TAU groups.

The current study found a significant increase in the M-HMTW children's total expressive vocabulary from T1 to T2 but the same increase was not found in the TAU children's total expressive vocabulary. The within-group analyses also showed an increase in the children's social communication for both the M-HMTW and TAU. These findings however, do not mean that either the M-HMTW or the TAU intervention is effective in improving those child outcome measures. Without a non-intervention control group, which is not ethical and feasible to conduct in this context, maturation effects could not be ruled out due to the change the children made (Bradshaw et al., 2015; Rogers et al., 2019).

Altogether, the nonsignificant differences in most child outcomes between- and within-groups could be an indication that immediate measurement of post-intervention outcomes in both the M-HMTW and TAU interventions is not sufficient to detect the growth trajectory of children with ASD in the short-term, in this case, 4 months. Further analyses relating to how child baseline measures influence their potential of improvement will be needed in future studies.

Feasibility

PMIs involve the delivery of early intervention by the parents who are regarded as the primary interventionists for their children. It is important that an intervention is acceptable and

deemed applicable by parents of a particular community before they commit to the intervention. It is also important that feasibility is ascertained for future replication of the study. The feasibility of the M-HMTW was investigated by analysing the: (a) attrition rate and (b) 10 dimensions of Gadke et al.'s (2021) feasibility protocol for feasibility research. The current study had adequate feasibility for practicality, adaptability, and implementation. It partially met the feasibility benchmark for data collection, design procedure, social validity, integration, and effectiveness, and had poor recruitment capability and generalisability.

Attrition Rates

The purpose of measuring attrition in this intervention study is to determine the feasibility of implementing the M-HMTW in Malaysia, reporting loss of the strength of the study, and assess the presence of attrition bias that further poses threats to the internal validity of the study. In this study, although the attrition rates were high prior to the commencement of the M-H MTW and TAU interventions, the between-group attrition rates did not differ significantly. Therefore although the high attrition rates result in a drastic reduction in sample size from 59 dyads to 37 dyads, there was no attrition bias, and there was homogeneity in all baseline measures except child coordinating JE. Subsequently, during intervention, another five mother-child dyads from the M-HMTW attrited during the course of intervention, resulted in attrition bias based on the WWC's attrition standard (2020). The attrition bias changed the initial homogeneity of the between-group child baseline measures (i.e. total receptive vocabulary, total expressive vocabulary, and social communication) and further reduced the statistical power of the study. It is suggested that these attrition rates are included in the planning of sample size in future studies.

Ten Dimensions of Feasibility (Gadke et al., 2021)

The study showed feasibility in terms of practicality, adaptability, and implementation. The M-HMTW can be implemented by SLTs who have undergone sufficient training with, and certified by the Hanen Centre. The availability of the Malay training materials reduce language barriers among mothers who are not proficient in English. The evidence-based principles and strategies of M-HMTW

are aligned with the training of SLTs in Malaysia, the Malaysian ASD Clinical Practice Guidelines, (Ministry of Health Malaysia, 2015) and WHO's (2017) recommendation of including parents in their children's education and support provision. Although it was initially hypothesised that the success of PMI was culture-specific (Joginder Singh et al., 2011; Kumpfer et al., 2002; Larson et al., 2020), this study revealed preliminary findings that mothers who completed the M-HMTW intervention shifted from favouring a more therapist-centred approach to a more family-centred approach in intervention.

The feasibility analyses showed only partial feasibility in data collection, design procedure, social validity, integration, and effectiveness. Although the instruments used were adapted from existing instruments, following my arguments in the earlier sections, for an intervention of a short period like the M-HMTW, a parental report of mother-child practices, and Likert-rating of children's joint engagement measures might not be sensitive enough to detect changes. Furthermore, the Malay mothers might need additional time to achieve implementation fidelity and change their interaction practices with their children because of their pre-existing cultural beliefs about family-centred intervention. Without adequate mastery of skills, they may not be able to quickly effect in changes in their children's joint engagement and language development.

The social validity of the M-HMTW was only supported by 45.2% (i.e. 14/31) of the mothers who completed the intervention. Social validity was compromised by the high attrition rates. Bradshaw et al. (2020) argued that PMIs require high commitment and engagement from parents. Similar to many PMIs, the M-HMTW requires high levels of commitment and engagement such as time and proficiency in reading the parent guidebook before each group session, attending regular (e.g. fortnightly) parental group sessions, and consistency in planning, implementing and troubleshooting their children's intervention goal and home activities. In contrast, the TAU did not record withdrawal from any parents once the intervention started because of its relatively low intensity in time and commitment. Additionally, any missed TAU session could be replaced in the

future. In fact, Ruggero et al. (2012) demonstrated that the one-to-one intervention was also preferred by parents from Western and high-resource countries.

The social validity issue faced by the mothers of this study was related to the issue of integration. The mothers who withdrew from the M-HMTW gave reasons such as time constraint due to their full-time work status, household income, and distance to the intervention location, all of which were indicated by Bradshaw et al.'s (2020) study as factors that predict parental enrollment in a PMI. These factors were not integrated in the infrastructure of the M-HMTW intervention provision. Bradshaw et al. (2020) further revealed that in comparison to intensive weekly intervention in randomised controlled trials, a majority of the families in the control group were retained in a longitudinal study that required three visits to the clinic in a year (Bradshaw et al., 2020). An intervention of high commitment of time in Malaysia will need to be supported by additional infrastructure such as childcare and time-off from employment. Although the within-group analyses could not rule out maturation effects, the findings show that the low intensity TAU that still involves parents may still be a feasible option to parents who needed infrastructe and financial support that is not integrated into the intervention.

The effectiveness of M-HMTW was supported by its ability to empower the mothers to be more inclined towards family-centred intervention at T2 but not by the lack of intervention effects in the child outcomes, as reported in the earlier sections. The effectiveness issue faced in this study was related to other feasibility dimensions such as data collection, design procedure, and recruitment capability.

Finally, the study did not meet the feasibility criteria for recruitment capability and generalisability. Out of the 330 mothers who expressed interest to participate in the study, only 59 dyads met the inclusion criteria of the study. Upon being assigned to their intervention groups, only 45.2% (i.e. 14/31) of the mothers completed the M-HMTW intervention. Out of the 54.8% (i.e. 17/31) of mothers who dropped out of from the M-HMTW intervention, 38.7% (i.e. 12/31) of them never attended a single session and 16.1% (i.e. 5/31) withdrew after attending fewer than three sessions.

Although these attrition rates indicated challenges in participant recruitment (Gadke et al., 2021) and resulted in attrition bias to the study's overall design and per-protocol sample size (US Institute of Education Sciences, 2020; WWC, 2020), researchers such as Petrenko (2013) and Chacko et al. (2016) reported similar attrition rates in the PMIs that they reviewed. Petrenko (2013) reviewed 17 studies of intervention programmes for young children with developmental challenges and suggested that sample sizes that ranged from 10 to 48 participants (*n* = 20-30 per group) could have overall attrition rates of between 0% and 54%. Chacko et al.'s (2016) systematic review of 262 behavioural parent training studies suggested that the attrition in the parent training group (experimental condition) was at least 51%. Chacko et al. (2016) further showed that in those studies, about 39% of participants never attended a parent training session and 13% dropped out during the intervention period. These high overall attrition and attrition in the PMI conditions raise questions regarding feasibility and barriers in implementing PMIs. Different attrition rates should therefore be accounted in sample size estimation of PMI studies.

With regard to generalisability, the interventions were implemented in environments that were as naturalistic as possible, i.e. real-life intervention sites, and utilised instruments that measured generalised skills. Generalised skills, according to Yoder et al. (2013) were those that did not exactly match the intervention practices. In this study, the instruments measured skills shown in non-intervention contexts. However, the mothers and children did not show significant changes in almost all measures, partly because of issues related to data collection and design, and recruitment capabilities.

Chapter 6: Conclusion

This chapter summarises the key findings pertaining to the three research questions. The present study was designed to determine: (a) the effects of the M-HMTW on mothers' beliefs in family-centred intervention and practices of mother-child interactions; (b) the effects of the M-HMTW on the following child outcomes: supported JE, coordinated JE, total receptive vocabulary, total expressive vocabulary, and social communication; and (c) the feasibility of implementing the M-HMTW among Malaysian Malay mothers of children with ASD. This is followed by a discussion of implications in relation to the theory underpinning the PMIs and some practical recommendations. Finally, this chapter presents the study's limitations and future research directions to advance knowledge in the field of PMIs.

Summary of the Study and Key Findings

To date, no empirical study has specifically examined the intervention effects on Malaysian Malay mothers' beliefs in family-centred intervention and their practices of mother-child interactions. The key findings that emerged from this study fill gaps in our understanding of cultural changes in the implementation of a PMI with Malay families in Malaysia. The study provides preliminary evidence that the mothers, regardless of their intervention group generally prioritised therapist-centred intervention and adopted similar mother-child interaction patterns at baseline. This preliminary finding suggests a similarity in pre-existing notions about intervention among the Malay mothers. However, mothers who completed the M-HMTW changed their priority to family-centred intervention. This subsequent finding shows that the M-HMTW, a PMI, can empower the Malay mothers to believe in the values of their participation in decision making and as a co-therapist. These values are important to reduce parents' heavy reliance on the limited number of SLTs in Malaysia when it comes to ameliorating their children's language and social communication delay.

However, the effectiveness of the M-HMTW in improving the children's JE, language, and social communication skills could not be ascertained in this study. No significant gain was found in those child outcomes. This lack of intervention effect could be attributed to the lack of: (a) mothers'

skill mastery, (b) sensitivity of the instruments in detecting changes within a short period of time, and (c) the need for an additional post-intervention time point, T3, to measure the mothers' and children's development might help to clarify whether a longer duration of time is needed for the participants to show improvements in the skills measured.

Lastly, based on Gadke et al.'s (2021) feasibility protocol, this M-HMTW study shows adequate feasibility in the dimensions of practicality, adaptability, and implementation; partial feasibility in the dimensions of data collection, design procedure, social validity, integration, and effectiveness; and poor feasilibility in the dimensions of recruitment capability and generalisability. The dimensions of practicality, adaptability, and implementation show that there are sufficient resources in Malaysia to implement the M-HMTW, an intervention that suits the clinical population of young children with ASD in Malaysia. However, barriers such as inadequate integration of infrastructure to support sustainable participation in the M-HMTW compromise the study's social validity, recruitment capability, and intervention effectiveness.

Implications

Theoretical Implications

This study supports Vygotsky's (1979) cultural social interaction model that learning is intertwined with environment and culture through social interaction (Vygotsky, 1978, 1986). The findings of this study extends the application of the theory by highlighting that in early language intervention, learning is not limited to children but involves adults as well. PMIs provide a platform for parents to modify their interactional behaviours and linguistic patterns to effectively ameliorate language and social communication issues in their children with ASD.

Past studies hypothesised that cultural beliefs could influence mothers' uptake of family-centred principles in PMIs (Joginder Singh et al., 2011; Larson et al., 2020; Trivette et al., 2010). The findings of this study show that after completing the M-HMTW, Malay mothers whose beliefs were initially inclined towards the therapist-centred approach, developed greater awareness of family-centredness than mothers who did not complete a PMI. This could be a dynamic interaction

exchange (Bronfenbrenner, 1979; Vygotsky, 1978) between the Malay parents' cultural beliefs and the principles underlying the PMIs. The shift to family-centredness reflects potentials in being an active co-therapist in the intervention process. By involving parents actively as co-therapists, they are educated, empowered as equal partners, and work collaboratively with their children's SLT in early language interventions for their children with ASD.

Practical Implications

Although the M-HMTW could shift mothers' perspectives from favouring a therapist-centred approach to a family-centred one, inadequate external supports such as childcare, time-off from employment, and travelling time could discourage them from completing the PMI. SLTs and local interventionists are therefore advised to help parents consider not just cultural influences (Eggebrecht et al., 2017; Van Kleeck, 1994; Vigil, 2002) but external support before suggesting JA-based PMIs to Malaysian families. Explicit steps may be needed to understand the family and cultural differences, needs, and challenges, as well as to heighten the potential of parents to become effective co-therapists to their children. The M-HMTW differs from the TAU intervention in terms of intervention intensity and the extent of parental involvement. As such, the provision of counseling, family education, and extra supports prior to introducing the M-HMTW may encourage more Malaysian parents of children with ASD to undergo and complete the M-HMTW intervention.

Limitations and Future Directions

The first limitation of this study is the high attrition rate in the targeted M-HMTW intervention which reduced the statistical power of the study. This limitation affects several feasibility dimensions in Gadke et al's. (2021) feasibility protocol, including social validity, effectiveness, and generalisability. Future replication of this study should include the attrition rates in sample size estimation to increase chances for achieving adequate statistical power, detection of statistically significant differences and true effects, and rigorous evaluation of PMIs (Petrenko, 2013).

The second limitation is linked to data collection and design procedures. Only two-timed assessments were conducted because of financial and time constraints. Furthermore, the use of a

self-reported questionnaire and JERI scale might not be adequately sensitive to measure fine changes in the mothers' interaction behaviours with their young children and the young children's changes in JE, respectively within a short period of time. Future studies should consider assessing the mothers and children's skills at least 6 - 12 months post-intervention as the third assessment time point, and use objective behavioural measurements such as behaviour-coding analyses or technology-based automated speech analysis software to analyse the mothers' interactional behaviours.

The third limitation refers to participants' representation. This study's findings were drawn from only one ethnic group in Malaysia, Malay families living in urban areas in two states, Kuala Lumpur and Selangor in central Malaysia. Future recruitment of participants should be extended to include rural sites and other states in Malaysia. A larger sample size may also include participants from different sub-groups such as low- and high-JE, different communication modes (i.e. verbal and non-verbal communication), ethnic (i.e. Malay, Chinese, Indian, Iban, etc.), and linguistic backgrounds (i.e. Malay, English, Mandarin, etc.). The inclusion of other cultural and linguistic variables might provide other profound insights to support the use of PMIs in multilingual and multicultural countries.

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Appendix A

Information sheet for parents (English)

Title of study
Effectiveness of a joint-attention based and family-centred early language intervention for autism within the Malay cultural and linguistic context in Malaysia

Name of investigators and institutions
- Dr. Wong Tze Peng, School of Education, University of Nottingham Malaysia (UNMC)
- Associate Professor Julien Mayor, School of Psychology, UNMC
- Dr. Low Hui Min, School of Educational Studies, Universiti Sains Malaysia
- Chee Zia Wei, School of Education, UNMC

Name of sponsor
University of Nottingham Malaysia, through the Fundamental Research Grant Scheme (Ministry of Higher Education Malaysia)

Dear Parent,

We would like to invite you to take part in a research on language intervention for children with autism in Malaysia. Please take time to carefully read the following information. Please ask us if there is anything that is not clear or if you would like more information.

What are the aims of the research?
This research is done to identify the factors that would help SLTs and parents to improve the language and communication skills of children with autism in Malaysia.

Who else is and can be involved?
Besides you, other mothers of children with autism and their SLTs will be invited to participate. We are aiming to recruit around 75 mothers and their children.

What does the research involve?
You will be randomly assigned to one out of two types of language intervention as determined by the researchers for about 5 months. You will be asked to come for a pre- and a post-intervention assessment two to three weeks before the intervention starts and after the intervention ends. If you agree to participate in this research, we will provide information about the intervention to you. You are expected to participate in all the sessions of the intervention programme.

We will also assess your child's language and communication skills before and after the intervention.

In this research, we will obtain the following information about your child and yourself during the assessment sessions before and after the intervention:
- Background information about yourself and your child as well as your opinions about language intervention through a questionnaire. We will request that you fill out the questionnaire during the assessment session. One of the research team members will be there to explain the contents of the questionnaire that are unclear to you. This will take about 30 minutes or slightly more.
- Your child's language skills through the assessment conducted by your SLT. This will take about 30 minutes or slightly more.

- Two video-recordings of a 15-minute play interaction between you and your child. You will be requested to play with your child as you normally would using a set of given toys that your child is interested in.

Altogether, it is anticipated that the assessment sessions will take 1.5 - 2 hours.

If you wish to take part in the intervention programme that you have not been assigned to, please inform your SLT. You will be given priority to attend the programme once you have completed this study.

What are the possible benefits of taking part?
Your child will receive a comprehensive language assessment before and after intervention. The data that we obtain will help us to identify effective language intervention factors for parents, therapists, and educators in Malaysia. Your participation is voluntary, therefore you will not be paid to take part.

What are the possible risks of taking part?
This is a very low risk research because it seeks to obtain general background and non-sensitive views about mothers' views through questionnaires and observations of mother-child interactions in a play session. Should an emergency occur during the data collection or intervention at the centre, you will be attended to as per the centre's emergency protocol. The investigators of the study shall be informed too.

Do I have to take part?
Your participation is entirely voluntary. It is important that you understand that you do not have to participate in the project at all and even if you decide to take part you are still free to stop at any time without giving a reason. Your decision in this study will not affect your future speech-language therapy sessions at the centre.

Will I be informed of the study findings?
Your SLT will verbally explain to you your child's assessment results before and after the intervention. Your SLTwill also answer questions about your child during the assessments and intervention sessions. As per the centre's protocol, your SLT will give you a written summary of the assessment findings only if you request it.

If you wish to receive a summary of the research findings, please contact the Principle Investigator, Dr Wong, or Research Assistant, Chee Zia Wei, through the email or telephone number given on this information sheet.

Can the research or my participation be terminated early?
You are free to stop taking part in the study at any time without giving any reasons. We will not terminate your participation in this study unless you wish to do so. Please inform your SLT, the principle coordinator, or investigator of the study (contacts given below) should you wish to withdraw from the study. Once notifying us, we will contact you for confirmation of withdrawal. We will then remove the data related to you and your child from our findings and return them to you. Your child's future speech-language therapy sessions in the centre or other organisations will not be affected should you choose to withdraw from this study.

What kind of intervention will my child receive after participation in the study?
After the completion of the intervention of this study, your child will continue to receive regular speech-language therapy sessions in the centre. Whether you complete the study or withdraw early,

your child's SLTwill discuss the best alternatives for your child with you according to the centre's intervention protocol.

What are my alternatives if I do not participate in this study?
If you do not wish to participate in this study, you will receive speech and language intervention sessions according to the centre's protocol. You may consult your child's SLT at the centre for her/his best recommendations to improve your child's language and communication development. The alternative therapy will not bring potential risks to you or your child.

Will my taking part in this study be kept confidential?
All information that we collect from you and your child will be anonymised, so neither you nor your child will be shown to the public.

Who has access to data obtained from this study?
Only members of the research team (as stated on Page 1) will have access to your medical records and research data. We expect to talk about our research at professional conferences and write about it in academic journals but your child's and your names will not appear on these reports.

We are committed to carrying out our research according to the ethical guidelines provided by the British Educational Research Association (online at http://tinyurl.com/6r5juen), and by the Medical Research & Ethics Committee, Ministry of Health Malaysia.

Who is paying for this research and who is carrying it out?
The research is funded by the Fundamental Research Grant Scheme (FRGS), Ministry of Higher Education Malaysia. The research is carried out by the FRGS recipients in collaboration with the researchers in the centre. The costs for the implementation of the study, including data collection and utilisation of facilities and services, are funded by the FRGS.

Who should I call if I have questions?
If you have any questions or concerns about the research you can contact the principal investigators:
Dr Wong Tze Peng
e: tzepeng.wong@nottingham.edu.my
p: +6 (03) 8725 3590, or
Chee Zia Wei
e: kabx6czw@nottingham.edu.my
p: + 6 017 261 8793
If you have any questions about your rights as a participant in this study, please contact:

- The Research Ethics Committee, University of Nottingham Malaysia, FASSResearchEthics@nottingham.edu.my

Information sheet for parents (Malay)

Maklumat Kajian Untuk Ibubapa

Tajuk kajian:
Keberkesanan intervensi bahasa bagi autisme yang berdasarkan kesamaan-perhatian dan bertumpukan-keluarga dalam konteks budaya dan bahasa Melayu di Malaysia.

Nama penyelik-penyelidik dan institusi-institusi:
- Dr. Wong Tze Peng, School of Education, University of Nottingham Malaysia (UNMC)
- Profesor Madya Julien Mayor, School of Psychology, UNMC
- Dr. Low Hui Min, Pusat Pengajian Ilmu Pendidikan, Universiti Sains Malaysia
- Chee Zia Wei, School of Education, UNMC

Nama sponsor: University of Nottingham Malaysia melalui Skim Geran Penyelidikan Fundamental (FRGS), Kementerian Pendidikan Tinggi Malaysia

Para ibu yang dihormati,

Kami ingin menjemput anda untuk menyertai penyelidikan mengenai intervensi bahasa untuk kanak-kanak autisme di Malaysia.

Sila ambil masa untuk membaca maklumat berikutnya dengan teliti. Jika terdapat perkara yang tidak jelas atau memerlukan maklumat yang lebih lanjut, sila tanya kami.

Apakah tujuan kajian ini?
Kajian ini adalah bertujuan untuk mengenalpasti faktor-faktor yang akan membantu pegawai pemulihan perubatan (pertuturan) dan ibubapa untuk membantu perkembangan kemahiran bahasa dan komunikasi di kalangan kanak-kanak autisme di Malaysia.

Siapakah lagi yang akan terlibat dalam kajian ini?
Selain anda, para ibu yang mempunyai kanak-kanak autisme dan pegawai pemulihan bahasa dan pertuturan turut dijemput untuk menjadi peserta kajian. Kami berharap untuk mendapat seramai 75 pasangan ibu-anak untuk kajian ini.

Apakah prosedur kajian?
Anda akan diberikan salah satu daripada dua jenis intervensi bahasa secara rawak yang ditetapkan oleh para penyelidik selama 5 bulan. Anda akan dijemput menghadiri penilaian dalam masa 2 atau 3 minggu sebelum dan selepas intervensi. Jika anda bersetuju untuk menyertai kajian ini, kami akan memberi maklumat terapi bahasa-pertuturan yang selanjutnya kepada anda. Anda dikehendaki menghadiri semua sesi intervensi yang ditetapkan.

Kami juga akan menilai kemahiran bahasa dan pertuturan anak anda sebelum dan selepas terapi. Selain itu, kami akan mendapatkan maklumat berikut dari anda:
- Latar belakang anda dan anak anda dan pendapat anda terhadap pegawai pemulihan bahasa dan pertuturan anak anda melalui soal selidik. Kami akan meminta anda mengisi borang soal selidik semasa sesi penilaian. Salah seorang ahli penyelidikan akan menerangkan kandungan soal selidik yang mana anda tidak jelas. Ia akan mengambil masa selama 30 minit atau lebih.
- Kemahiran bahasa anak anda akan dinilai oleh pegawai pemulihan pertuturan dan bahasa anda. Ia akan mengambil masa selama 30 minit atau lebih.

- Dua rakaman video selama 15 minit di mana anda berinteraksi dengan anak anda. Anda akan diminta untuk bermain dengan anak anda seperti biasa dengan menggunakan mainan anak anda berminat yang disediakan.

Secara keseluruhannya, sesi penilaian dijangkakan akan mengambil masa 1.5 - 2 jam.

Jika anda ingin mengambil bahagian dalam program intervensi yang tidak diberikan, sila maklumkan pegawai pemulihan bahasa dan pertuturan anda. Anda akan diberi keutamaan untuk menghadiri program tersebut setelah anda selesai kajian ini.

Apakah manfaat kajian ini?
Anak anda akan menerima ujian bahasa yang menyeluruh sebelum dan selepas intervensi. Data yang diperolehi akan digunakan untuk mengenalpasti faktor-faktor dan keberkesanan kaedah intervensi bahasa untuk ibubapa, terapi pertuturan-bahasa, dan para pendidik di Malaysia. Penyertaan anda adalah secara sukarela, oleh itu anda tidak akan dibayar untuk mengambil bahagian.

Apakah risiko kajian ini?
Kajian ini adalah berisiko sangat rendah kerana hanya latar belakang umum dan pandangan bukan sensitif mengenai pandangan ibu melalui soal selidik dan pemerhatian interaksi ibu dan anak dalam sesi permainan didapatkan.
Sekiranya berlaku kecemasan semasa pengumpulan data atau pemulihaan di hospital atau pusat intervensi, anda akan dihadiri mengikuti protokol kecemasan hospital atau pusat intervensi tersebut. Para penyelidik kajian akan dimaklumkan juga.

Adakah saya perlu menyertai kajian ini?
Penyertaan anda adalah secara sukarela. Anda berhak untuk memilih tidak menyertai kajian. Setelah bersetuju untuk menyertai kajian ini, anda masih berhak untuk menarik diri bila-bila masa tanpa memberi sebarang penjelasan. Keputusan anda tidak akan memberi kesan kepada pegawai pemulihan bahasa dan pertuturan anak anda pada masa hadapan.

Adakah saya diberitahu tentang keputusan kajian?
Pegawai pemulihan bahasa dan pertuturan anda akan memberikan penjelasan secara lisan mengenai keputusan penilaian bahasa anak anda sebelum dan selepas intervensi. Pegawai pemulihan bahasa dan pertuturan anda juga akan menjawab pertanyaan tentang prestasi anak anda semasa sesi-sesi penilaian dan intervensi. Jika anda ingin mendapatkan ringkasan bertulis penemuan penilaian, anda dikehendaki meminta daripada pegawai pemulihan anda mengikuti protokol hospital atau pusat intervensi tersebut.

Jika anda ingin menerima ringkasan hasil penyelidikan, sila hubungi Ketua Penyelidik, Dr Wong, atau Pembantu Penyelidik, Chee Zia Wei, melalui e-mel atau nombor telefon yang diberikan di dalam lembaran maklumat ini.

Bolehkah penyelidikan ini atau penyertaan saya ditamatkan awal?
Ya, anda berhak untuk menarik diri bila-bila masa tanpa memberi penjelasan. Kami tidak akan menamatkan penyertaan anda melainkan anda ingin menarik diri. Sila maklumkan kepada pegawai pemulihan pertuturan dan bahasa anda, ketua penyelaras, atau penyelidik kajian (kenalan diberikan di bawah) jika anda ingin menarik diri daripada kajian ini. Setelah memberitahu kami, kami akan menghubungi anda untuk pengesahan pengeluaran. Data anda dan anak anda tidak akan dimasukkan dalam penemuan kami dan akan dikembalikan kepada anda. Sesi-sesi terapi bahasa-

pertuturan masa depan anak anda di hospital, pusat intervensi, atau organisasi lain tidak akan terjejas sekiranya anda memilih untuk menarik diri daripada kajian ini.

Apakah jenis rawatan yang akan anak saya terima selepas menyertai kajian ini?
Selepas tamatnya kajian ini, anak anda akan terus menerima sesi terapi pertuturan-bahasa seperti biasa di hospital atau pusat intervensi tersebut. Sama ada anda melengkapkan atau menghentikan kajian ini, pegawai pemulihan pertuturan dan bahasa anda akan berbincang dengan anda mengenai rancangan intervensi atau alternatif yang terbaik untuk anak anda mengikut protokol pemulihan hospital atau pusat intervensi tersebut.

Apakah intervensi alternatif lain sekiranya saya tidak menyertai penyelidikan ini?
Sekiranya anda tidak ingin menyertai penyelidikan ini, anak anda masih akan diberikan intervensi mengikut protokol hospital atau pusat intervensi tersebut. Pegawai pemulihan dan bahasa anda akan memberikan nasihat dan cadangan intervensi yang sesuai untuk perkembangan bahasa dan komunikasi anak anda. Intervensi alternatif yang anda terima tidak akan membawa risiko kepada anda atau anak anda.

Adakah penglibatan saya dalam kajian ini dijangkakan kerahsiaan?
Segala maklumat yang kami perolehi dari kajian ini adalah sulit. Identiti anda dan anak anda tidak akan dapat dikenalpasti secara perseorangan atau dikemukakan secara umum.

Siapakah mempunyai akses kepada data yang diperolehi daripada kajian ini?
Hanya ahli pasukan penyelidikan (seperti yang dinyatakan di muka surat 1) akan mempunyai akses kepada rekod perubatan dan data penyelidikan anda. Adalah dijangkakan bahawa maklumat kajian akan dilaporkan di persidangan profesional dan di dalam jurnal akademik, tetapi nama anda dan anak anda tidak akan dinyatakan dalam laporan-laporan tersebut.

Kami bertekad mematuhi garispanduan etika Persatuan Kajian Pendidikan British ("British Educational Research Association" (http://tinyurl.com/6r5juen) dan Jawatankuasa Etika dan Penyelidikan Perubatan (JEPP), Kementerian Kesihatan Malaysia ("Medical Research and Ethics Committee, Ministry of Health Malaysia") sewaktu melaksanakan kajian kami.

Siapakah yang akan membiayai kajian ini?
Kajian ini dibiayai oleh Skim Geran Penyelidikan Fundamental (FRGS) yang dianugerahkan kepada para penyelidik UNMC oleh Kementerian Pendidikan Tinggi Malaysia. Kajian ini dijalankan oleh penerima FRGS dengan kerjasama penyelidik-penyelidik di hospital atau pusat intervensi tersebut. Kos bagi pelaksanaan kajian ini, termasuk pengumpulan data dan penggunaan kemudahan dan perkhidmatan di hospital atau pusat intervensi, akan dibiayai oleh FRGS.

Siapakah yang perlu saya hubungi sekiranya saya mempunyai sebarang pertanyaan?
Jika anda mempunyai sebarang pertanyaan atau kemusyikilan, sila hubungi penyelidik berikutnya:

Dr Wong Tze Peng
e: tzepeng.wong@nottingham.edu.my
p: +6 (03) 8725 3590
Chee Zia Wei
e: kabx6czw@nottingham.edu.my
p: + 6 017 261 8793
Anda juga boleh melaporkan isu-isu berkenaan kajian ini kepada:
Jawatankuasa Etika Kajian ("Research Ethics Committee"), University of Nottingham Malaysia, FASSResearchEthics@nottingham.edu.my

Appendix B

Parental consent form (English)

Title of study

Effectiveness of a joint-attention based and family-centred early language intervention for autism within the Malay cultural and linguistic context in Malaysia

By signing below I confirm the following that I:

1. have read the Information Sheet.
2. understand the nature and purpose of this research.
3. have received enough information to make an informed decision about taking part.
4. understand that I can raise questions, offer criticisms, and make suggestions about the project.
5. know that my child and my participation in this research is entirely voluntary.
6. understand that I can decide *not* to participate in this project at any time after agreeing to.
7. agree to allow my interactions with my child to be video-recorded.
8. agree for my child's and my responses to be analysed for this research.
9. understand that I can request for a print summary of my child's assessment outcomes from my SLT.
10. understand that I can request the Principle Investigator to give me summary of my data in the research findings.
11. understand that I can request to attend the other intervention programme that I am not assigned to after I have completed this study.
12. consent to take part in this project after considering the information provided.

Participant/Parent:

Signature: ……

Name: ……

Date: ……

Relationship with the child: Mother/ Father/ Other (please state): ……

Investigator conducting informed consent:

Signature: ……

Name: ……

Date: ……

Participant Code (for research team use):…….....

Parental consent form (Malay)

Borang Keizinan Ibu

Tajuk kajian
Keberkesanan intervensi bahasa bagi autisme yang berdasarkan kesamaan-perhatian dan bertumpukan-keluarga dalam konteks budaya dan bahasa Melayu di Malaysia.

Dengan menandatangani di bawah, saya mengesahkan bahawa saya:

1. telah membaca Maklumat Kajian ini.
2. faham mengenai tujuan, cara, dan prosedur kajian ini.
3. telah menerima maklumat yang sepenuhnya sebelum bersetuju untuk menyertai kajian ini.
4. faham bahawa saya boleh menyoal, mengkritik, atau memberi cadangan tentang kajian ini.
5. faham bahawa penyertaan saya dengan anak saya dalam kajian ini adalah secara sukarela.
6. faham bahawa saya dan anak saya berhak untuk *menarik diri* daripada kajian ini selepas penyertaan.
7. bersetuju supaya interaksi saya dengan anak saya dirakamkan video.
8. memberikan kebenaran untuk maklumat saya dan anak saya dianalisa oleh pihak penyelidik.
9. faham bahawa saya boleh meminta pegawai pemulihan pertuturan dan bahasa saya untuk mendapatkan ringkasan hasil penilaian anak saya.
10. faham bahawa saya boleh meminta Ketua Penyelidik untuk memberikan ringkasan data saya daripada hasil penyelidikan ini.
11. faham bahawa saya boleh meminta kebenaran untuk menghadiri program intervensi yang lain di mana saya tidak ditawarkan setelah saya selesaikan kajian ini.
12. berizin untuk menyertai projek kajian ini setelah mempertimbangkan semua maklumat yang diperolehi.

Peserta Kajian/Ibubapa:
Tandatangan: ……
Nama: ……
Tarikh: ……
Hubungan kepada kanak-kanak: Ibu/ Bapa/ Lain-lain (sila nyata): ……

Penyelidik yang mengendalikan proses menandatangani boring keizinan:

Tandatangan: ……
Nama: ……
Tarikh: ……

Kod Peserta (diisi oleh kumpulan kajian):……

Appendix C

Video consent form (English)

Child's Name: ……
Date of birth: ……

I agree to be video recorded with my child as part of my participation in "Effectiveness of a joint-attention based and family-centred early language intervention for autism within the Malay cultural and linguistic context in Malaysia."

These videos can be used for research, educational, and assessment purposes, and for the purpose of creating future locally-suited early language intervention programmes.

Participant/Parent:

Signature: ……
Name: ……
Date: ……
Relationship with the child: Mother/ Father/ Other (please state): ……

Investigator conducting informed consent:

Signature: ……
Name: ……
Date: ……

Participant Code (for research team use):…….....

Video consent form (Malay)

Borang Keizinan Untuk Rakaman Video

Nama Anak: ……

Tarikh Lahir: ……

I bersetuju dengan rakaman video mengenai interaksi saya dan anak saya sewaktu tempoh penyertaan kami dalam kajian "Keberkesanan intervensi bahasa bagi autisme yang berdasarkan kesamaan-perhatian dan bertumpukan-keluarga dalam konteks budaya dan bahasa Melayu di Malaysia"

Video-video tersebut akan digunakan untuk tujuan penyelidikan, pendidikan, dan latihan pembetukan intervensi bahasa tempatan untuk masa hadapan.

Peserta Kajian/Ibubapa:

Tandatangan: ……
Nama: ……
Tarikh: ……
Hubungan kepada kanak-kanak: Ibu/ Bapa/ Lain-lain (sila nyata): ……

Penyelidik yang mengendalikan proses menandatangani boring keizinan:

Tandatangan: ……
Nama: ……
Tarikh: ……

Kod Peserta (diisi oleh kumpulan kajian):……

Appendix D

Parental Beliefs and Practices Questionnaire (English)

Questionnaire
Section A: Background information

Mother's age: _____ years old.

Where do you stay?

State _____ District _____

How long have you stayed at your current district and state?

_____ years.

Where did you stay before this? (if relevant)

State _____ District _____

How many children do you have? _____

Do family members other than yourself, your husband and your children live in your home?
Yes / No
If Yes, what is their relationship with your child(ren)? _____

Does/do your child(ren) have special needs? Yes / No
If Yes, how old is/are your child(ren)? _____
What is/are your child(ren)'s diagnosis/diagnoses? _____

Who is the main caretaker of all your children? _____

Who is the main caretaker of your child with special needs? (if relevant) _____

For each child between the age of 2 and 7 years old, does he/she attend daycare or preschool?

Child 1: Yes/No Age: No. of hours spent at daycare/preschool in a week:
Child 2: Yes/No Age: No. of hours spent at daycare/preschool in a week:
Child 3: Yes/No Age: No. of hours spent at daycare/preschool in a week:
Child 4: Yes/No Age: No. of hours spent at daycare/preschool in a week:
Child 5: Yes/No Age: No. of hours spent at daycare/preschool in a week:
Child 6: Yes/No Age: No. of hours spent at daycare/preschool in a week:

Does your child with special needs attend any intervention centre or special needs school?
(if relevant)?
Child 1: Yes/No Age: No. of hours spent at intervention centre/special needs school in a week:
Child 2: Yes/No Age: No. of hours spent at intervention centre/special needs school in a week:
Child 3: Yes/No Age: No. of hours spent at intervention centre/special needs school in a week:
Child 4: Yes/No Age: No. of hours spent at intervention centre/special needs school in a week:
Child 5: Yes/No Age: No. of hours spent at intervention centre/special needs school in a week:
Child 6: Yes/No Age: No. of hours spent at intervention centre/special needs school in a week:

Does your child with special needs attend any type of specialised intervention (if relevant)

☐ Speech and language therapy
☐ Occupational therapy
☐ Physiotherapy
☐ Applied Behaviour Analysis (ABA)
☐ Others _____

How important is it for your child(ren) to become bilingual? *(please circle)*
Very important Important Somewhat important Not important

How important is it for your child(ren) with special needs to become bilingual? *(please circle)*
Very important Important Somewhat important Not important

Please indicate your family's monthly household income:
☐ Less than RM 1,500
☐ RM 1,501 – 4,000
☐ RM 4,001 – 6,000
☐ RM 6,001 – 8,500
☐ RM 8,501 – 10,000
☐ RM 10,001 – 20,000
☐ RM 20,001 and above

Mother's occupation: _____

Mother's highest educational level:

☐ Lower than SPM
☐ SPM
☐ Diploma
☐ Bachelor degree from a College or Polytechnic
☐ Bachelor degree from a University
☐ Masters
☐ Ph.D.
☐ Others: _____

Section B

Circle the number that shows what you think about each of these statements if you had /when you bring your child to attend language intervention.

(*Note: SLT = speech-language therapist*)

		Strongly disagree	Disagree	Unsure	Agree	Strongly agree
1	My involvement is essential for language intervention to be effective.	1	2	3	4	5
2	To ensure intervention sessions are efficient, SLTs should work with my child and I should be observe the session.	1	2	3	4	5
3	Intervention should be flexible to accommodate each individual and family's priority, culture and beliefs.	1	2	3	4	5
4	My whole family should be involved in the intervention, not just my child.	1	2	3	4	5
5	I should be given a choice about how involved I am in my child's intervention.	1	2	3	4	5
6	If I am in the clinic room during intervention, my child does not perform as well.	1	2	3	4	5
7	I should have the final say on the content of intervention goals and activities.	1	2	3	4	5
8	I should be encouraged to participate in intervention sessions.	1	2	3	4	5
9	In some cases, the SLT's choice of particular intervention methods are best option for my child, even if I do not prefer this option.	1	2	3	4	5
10	I should be able to find the time to do homework activities with child.	1	2	3	4	5
11	Home activities must be completed exactly as intervention sessions in order to be effective.	1	2	3	4	5
12	I should be given the option to combine intervention goals with my child's daily activities.	1	2	3	4	5
13	My presence is very important during intervention sessions.	1	2	3	4	5
14	Intervention sessions should just focus on my child only.	1	2	3	4	5
15	I do not have the knowledge to decide on my child's intervention goals.	1	2	3	4	5

Section D

Circle the number that tells about how often you do the following things:

		Hardly ever	Some-times	Very often	Almost always
1.	Take my child to the park.	1	2	3	4
2.	Ask my child to practice religious songs and prayers.	1	2	3	4
3.	Play with my child for about 20 minutes or longer.	1	2	3	4
4.	Talk to my child during routine tasks such as dressing or bathing. Example: '*Mummy is putting on your shirt*'.	1	2	3	4
5.	Ask my child to repeat a word or a sentence after me.	1	2	3	4
6.	Sing or recite children's songs or rhymes with my child.	1	2	3	4
7.	Ask my child to tell me about what happened when I wasn't there. Example: '*What did you and grandma do today?'*	1	2	3	4
8.	Read a book to my child at bedtime	1	2	3	4
9.	Ask my child to tell another family member about something we did together. Example: '*Tell Auntie what we saw at the park.'*	1	2	3	4
10.	Follow along with my child's topic of conversation.	1	2	3	4
11.	Repeat what my child says, adding new words.	1	2	3	4
12	Tell my child if s/he leaves some words out of a sentence.	1	2	3	4

Thank you!

Parental Beliefs and Practices Questionnaire (Malay)

Soal-Selidik
Bahagian A: Maklumat Kajian Untuk Ibubapa

Unur ibu: _____ tahun.

Di manakah anda tinggal?
Negeri _____ Daerah _____

Berapa lamakah anda telah tinggal di daerah dan negeri sekarang?
_____ tahun.

Di manakah anda tinggal sebelum ini? (jika berkenaan)
Negeri _____ Daerah_____

Anda mempunyai berapa orang anak? _____

Selain suami dan anak anda, adakah ahli keluarga anda yang lain juga tinggal bersama anda? Ya / Tidak
Jika Ya, apakah hubungan mereka dengan anak anda? _____

Adakah anda anda mempunyai masalah kelainan upaya? Ya / Tidak
Jika Ya, berapakah umurnya? _____
Apakah diagnosis anak anda? _____

Siapakah penjaga utama untuk kesemua anak anda? _____

Siapakah penjaga utama anak anda yang mempunyai masalah kelainan upaya? (jika berkenaan)
_____

Untuk setiap anak anda yang berumur berumur 2 hingga 7 tahun, adakah mereka menghadiri taska atau tadika?
Anak 1: Ya/ Tidak Umur: Bilangan jam di taska/tadika setiap minggu:
Anak 2: Ya/ Tidak Umur: Bilangan jam di taska/tadika setiap minggu:
Anak 3: Ya/ Tidak Umur: Bilangan jam di taska/tadika setiap minggu:
Anak 4: Ya/ Tidak Umur: Bilangan jam di taska/tadika setiap minggu:
Anak 5: Ya/ Tidak Umur: Bilangan jam di taska/tadika setiap minggu:
Anak 6: Ya/ Tidak Umur: Bilangan jam di taska/tadika setiap minggu:

Adakah anak anda yang kelainan upaya menghadiri pusat intervensi atau sekolah khas? (jika berkenaan)
Anak 1: Ya/ Tidak Umur: Bilangan jam di pusat intervensi/sekolah khas setiap minggu:
Anak 2: Ya/ Tidak Umur: Bilangan jam di pusat intervensi/sekolah khas setiap minggu:
Anak 3: Ya/ Tidak Umur: Bilangan jam di pusat intervensi/sekolah khas setiap minggu:
Anak 4: Ya/ Tidak Umur: Bilangan jam di pusat intervensi/sekolah khas setiap minggu:

Adakah anak kelainan upaya anda menghadiri sebarang intervensi khas? (jika berkenaan)
☐ Terapi pertuturan dan bahasa
☐ Terapi cara kerja
☐ Fisioterapi
☐ Applied Behaviour Analysis (ABA)
☐ Lain-lain _____

Berapa pentingkah untuk kesemua anak anda mempelajari lebih daripada satu bahasa?
(sila bulatkan)

Sangat penting Penting Kurang penting Tidak penting

Berapa pentingkah untuk anak anda yang mempungai masalah kelainan upaya mempelajari lebih daripada satu bahasa? *(sila bulatkan)*
Sangat penting Penting Kurang penting Tidak penting

Sila tandakan pendapatan bulanan seisi keluarga:
☐ Kurang daripada RM 1,500
☐ RM 1,501 – 4,000
☐ RM 4,001 – 6,000
☐ RM 6,001 – 8,500
☐ RM 8,501 – 10,000
☐ RM 10,001 – 20,000
☐ RM 20,001 dan ke atas

Pekerjaan ibu: _____

Tahap pendidikan ibu yang tertinggi:
☐ Kurang daripada SPM
☐ SPM
☐ Diploma Kolej atau Politeknik
☐ Sarjanamuda Kolej atau Politeknik
☐ Sarjanamuda Universiti
☐ Ijazah Sarjana
☐ Ph.D.
☐ Lain-lain: _____

Bahagian B

Sila baca setiap kenyataan dengan teliti dan bulatkan pendapat anda dalam ruang yang sesuai.

		Sangat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Sangat setuju
1	Penglibatan saya adalah penting untuk memastikan keberkesanan intervensi.	1	2	3	4	5
2	Untuk memastikan sesi intervensi berjalan dengan berkesan, terapis yang sepatutnya mengajar anak saya, manakala saya hanya memerhatikan sesi tersebut.	1	2	3	4	5
3	Intervensi harus bersifat fleksibel mengikut keutamaan, kebudayaan, dan kepercayaan setiap individu dan keluarga.	1	2	3	4	5
4	Klien terapis ialah seluruh keluarga, bukan hanya anak saya yang bermasalah kelainan upaya sahaja.	1	2	3	4	5
5	Saya haruslah diberikan pilihan tentang penglibatan saya dalam intervensi anak saya.	1	2	3	4	5
6	Jika saya ada di dalam bilik terapi, anak saya tidak akan memberi respons yang baik.	1	2	3	4	5
7	Saya yang patut membuat keputusan muktamad tentang kandungan dan aktiviti intervensi.	1	2	3	4	5
8	Saya patut menyertai sesi dan aktiviti intervensi.	1	2	3	4	5
9	Pilihan terapis adalah pilihan yang paling bagus untuk anak saya walaupun keluarga saya tidak bersetuju dengan pilihan tersebut.	1	2	3	4	5
10	Saya harus mencari masa untuk membuat program rumah dengan anak saya.	1	2	3	4	5
11	Program rumah mestilah dilakukan sama seperti sesi terapi supaya berkesan.	1	2	3	4	5
12	Saya harus diberi pilihan untuk menggabungkan objektif terapi dengan aktiviti harian anak saya.	1	2	3	4	5
13	Kehadiran saya dalam sesi intervensi adalah sangat penting.	1	2	3	4	5
14	Sesi intervensi sepatutnya tertumpu kepada anak saya sahaja.	1	2	3	4	5
15	Saya tidak mempunyai pengetahuan untuk menentukan objektif intervensi anak saya.	1	2	3	4	5

Bahagian D

Sila bulatkan nombor yang mewakili berapa kerap anda melakukan perkara berikut:

		Hampir tidak pernah	Kadang-kadang	Sangat kerap	Hampir setiap hari
1.	Membawa anak saya ke taman.	1	2	3	4
2.	Menyuruh anak saya berlatih lagu agama dan berdoa.	1	2	3	4
3.	Bermain dengan anak saya selama 20 minit atau lebih lama setiap hari.	1	2	3	4
4.	Bercakap tentang rutin harian (seperti memakai baju atau mandi) kepada anak saya. Contohnya, *"Mak sedang pakaikan baju adik."*	1	2	3	4
5.	Menyuruh anak saya mengulangi perkataan atau ayat saya.	1	2	3	4
6.	Menyanyi lagu atau membaca pantun kanak-kanak bersama anak saya.	1	2	3	4
7.	Menyuruh anak saya memberitahu saya apa yang berlaku ketika saya tidak bersamanya. Contoh, *"Apa yang adik dan nenek buat hari ini?"*	1	2	3	4
8.	Membaca buku untuk anak saya sebelum tidur.	1	2	3	4
9.	Menyuruh anak saya memberitahu ahli keluarga lain tentang sesuatu yang kami lakukan bersama-sama. Contoh, *"Beritahu makcik apa yang kita nampak kat taman."*	1	2	3	4
10.	Mengikuti topik perbualan anak saya.	1	2	3	4
11.	Mengulangi apa yang anak saya cakap dengan menambahkan perkataan baru.	1	2	3	4
12	Memberitahu anak saya apabila dia tertinggal perkataan dalam ayatnya.	1	2	3	4

Terima kasih!

Appendix E

The Outline of the Hanen More Than Words (HMTW)

Session	Aim of the session
Orientation	Programme introduction and parents get to know each other.
Assessment (Pre-programme consultation)	Language and social-communication assessment and goal setting with the mother
Parent Group Session 1	Introduction of strategies to follow the child's lead
Parent Group Session 2	Introduction of strategies to sustain an interaction with the child
Video Feedback 1	Video recording of how the mother applied the learned strategies and giving feedback to support the mother's use of the strategies
Parent Group Session 3	Introduction of strategies that help the child play with people
Parent Group Session 4	Introduction of strategies that help the child learn through daily routines
Video Feedback 2	Video recording of how the mother applied the learned strategies and giving feedback to support the mother's use of the strategies
Parent Group Session 5	Introduction of strategies that help the child play with toys
Parent Group Session 6	Introduction of strategies that help the child communicate and play with friends
Parent Group Session 7	Introduction of strategies for shared book reading
Video Feedback 3	Video recording of how the mother applied the learned strategies and giving feedback to support the mother's use of the strategies
Parent Group Session 8	Review all strategies learnt, reflection of development made, and discussion about how the mothers can continue to use the strategies learnt

Appendix F

Communicative Context, Scenes, and Toys Used in the Communication Play Protocol (CPP)

Communicative Context	Scenes	Toys
	Free play	Farm house and animals Toy clock Cooking set Doll Mr. Potato
Social interacting	1: Turn taking	Ball Stacking toy Shape sorter Puzzles Object that affords repeated action
Requesting	2: Help me	Bubble Balloons Spinner Musical top
Commenting	3: Hidden objects	Animals Blocks Cars Fruits Knife/spoon
Narrating	4: Book	Malay story books