**Symposium Title**: The role of the social partner in the maintenance and development of communication and social skills in neurodevelopmental conditions

**Chair**: Katherine Ellis[[1]](#footnote-1),[[2]](#footnote-2)

**Discussant**: Leann DeWalt[[3]](#footnote-3)

**Overview**: Communication and social skills are key areas that support the well-being and inclusion for people with neurodevelopmental conditions (Oliver et al., 2022; Garcia et al., 2020). When studying the development of communication and social skills it is important to examine them within the context of social interaction with a social partner. Specifically, there is a need to consider both 1) how social partners’ communicative and social responses are influenced by the behaviors of the person with the neurodevelopmental conditions, as well as 2) how the social partners’ behaviors modulate communication and social skills of a person with a neurodevelopmental condition, both within their immediate social context and across long-term development. This symposium explores the relationships between core areas of communication and social characteristics identified within individual neurodevelopmental conditions (i.e., autistic children, toddlers with fragile X syndrome, and infants with Down syndrome) and key behaviors of social partners theorized to be associated with these characteristics. Collectively, these studies indicate that the social partner may be an important social environmental mechanism that can be readily targeted in intervention to support communication and social skills in people across a range of neurodevelopmental conditions.

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**Paper 1 of 3**

**Paper Title**: Caregiver scaffolding and its association with social engagement in autistic and non-autistic children during social interaction.

**Authors**: Sara Morris1, Sarah White1, Breanne Kearney1,[[4]](#footnote-4), Lucy Heap1, Hana Ahmad Faez1, Lauren Winsor1, Maddie West1, Regina Gomez1, Katherine Ellis1,2

**Introduction**: Scaffolding involves an ‘expert’ partner adapting their responses or the environment within reciprocal interactions to provide the level of assistance needed by their ‘novice’ partner (Renninger & Granott, 2005; Wood, Bruner & Ross, 1976). As well as supporting learning and development of a range of cognitive, social and emotional skills (Mermelshtine, 2017), scaffolding techniques are associated with greater social engagement in autistic children during social interaction (e.g. Pierucci, 2016). Scaffolding may therefore be a supportive social environmental mechanism that alleviates barriers to social interaction experienced by autistic children, whilst also facilitating social learning. Most studies broadly focus on the relationship between individual scaffolding strategy types (e.g. task-based, emotional or social) and total duration of autistic children’s social engagement across an entire interaction. Yet, social interaction is dynamic and complex; expert partners may employ a range of scaffolding strategies, specifically needed at key points of the interaction (e.g. child social disengagement) to best support child social engagement. Therefore, this study aims to compare the scaffolding strategies used by caregivers of autistic children to those used by caregivers of neurotypical children, and to explore the relationship between scaffolding techniques and social engagement in these groups both across the broader social interaction and at critical points (i.e. child disengagement).

**Method**: Thirty caregiver-child dyads (15 autistic children, 12 male, Mean age = 7.47, SD = 1.10; 15 neurotypical children, 10 male, Mean age = 7.00, SD = 1.00) took part in a 10-minute semi-structured social interaction involving social games. Caregivers completed the Vineland Adaptive Behavior Scales (Vineland-3) and communication and motor standard scores were used as a proxy of verbal and non-verbal cognitive abilities. Videos were coded for nine caregiver scaffolding strategies in three domains (task-based, social, emotional). Child social engagement, social disengagement, and positive and negative affect were also coded.

**Results**: Descriptive statistics indicate that both neurotypical and autistic children spent a high proportion of time socially engaged (neurotypical Mean=94.8%; autistic Mean=91.4%), showed high levels of positive (3.55; 3.47 out of 0-4 scale) and low levels of negative affect (0.73; 0.60 out of 0-4 scale) across the entire interaction. A one-way MANOVA indicated that caregivers of autistic children used fewer task-based (p=0.037) but more frequent emotional (p=0.019) and social (p=.001) scaffolds compared to caregivers of neurotypical children. However, controlling for motor ability (Vineland-3) removed the group difference on frequency of social scaffolds. Multiple regressions for each group revealed that only frequency of social supports was significantly associated with proportion of time the neurotypical (p=.009) and autistic children (p=.010) spent socially engaged across the entire interaction. Finally, a 2 (between: group) x 2 (within: scaffolding technique used/not used) mixed ANOVA on the mean duration children took to re-engage following disengagement revealed a significant interaction (p=.044). Post-hoc follow up tests indicated that whilst autistic children took significantly longer to reengage than neurotypical children when their caregiver did not use a scaffolding technique after disengagement (p=0.024), there was no group difference when a scaffolding technique was used.

**Discussion**: Caregivers of autistic children use different scaffolding strategies compared to caregivers of neurotypical children during social interactions. Interestingly, only social scaffolds were associated with more social engagement across the entire interaction in both groups. Social scaffolds may be used continually to maintain interaction and children’s social engagement, whereas task-based and emotion scaffolds may only be implemented at key points in response to children’s task- or emotional-related challenges. Findings also indicated that the timing of caregiver’s scaffolds may be critical for autistic children’s social engagement, by supporting children to re-engage after periods of disengagement. The high levels of positive affect and low levels of negative affect indicate that scaffolding may have helped children re-engage into an enjoyable social interaction. Findings highlight how the social environment might be modified to support children to engage and maintain positive interactions and provide opportunities for social learning.

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**Paper 2 of 3**

**Paper Title**: Child Deictic Gesture Use and Maternal Labeling in Young Children with Fragile X Syndrome

**Authors**: Laura J. Mattie[[5]](#footnote-5), Daniela Fanta5, Karen Huang5, & Pamela Hadley5

**Introduction**: Children learn language through social interactions with a caregiver. For infants and toddlers, this tends to involve the use of gestures, which support effective communication and create opportunities for word learning (cf. Mattie & Hadley, 2021). When young children add gestures to early vocalizations, their communicative intent becomes clearer (Huttenlocher et al., 2010). Child gesture has also been linked to more effective caregiver-child communication during the pre-linguistic period. For example, if a child points at a ball, the parent can respond with the label “ball,” connecting the word to the object. Thus, caregivers often interpret the potentially communicative behaviors of the child (Dimitrova et al., 2016). The purpose of this study was to determine the association between child gesture use and maternal language input in young children with fragile X syndrome (FXS). We hypothesized that the frequency of child gestures will be positively correlated with maternal labeling.

**Method**: Participants were 14 young children with FXS (12-44 months) and their mothers, who played for 15 minutes with a standard set of toys. Videos were coded for child gesture (point, show, give), gestures were coded (Iverson et al., 1999; Mattie & Hadley, 2021). Maternal input was transcribed and coded for referential nouns and labels. Labels were defined as referential nouns in a single word or phrase (e.g., cow, blue pants) or in a pronoun+copula+noun phrase sentence (e.g., that’s the duck; Preza & Hadley, 2022). Total utterances, MLU in morphemes, number of different words), and the frequency of referential nouns and labels were computed. Mothers also completed the Vineland Adaptive Behavior Scales caregiver interview used for descriptive purposes.

**Results**: Of the different gesture types, young children with FXS most often used touch points or show gestures when communicating with their mothers. However, there was a lot of variability between children with one child not producing any gestures during the 15-minute free play. On average, maternal use of labels accounted for only 3.19% of all words mothers directed to their children during free play. Results indicated that maternal use of labels was positively related to child use of deictic gestures (give, point, show; *rs* = .69, p = .003), touch points (*rs* = .59, p = .014), all pointing (proximal, distal, touch; *rs* = .59, p = .013), and show gestures (*rs* = .51, p = .031). Significant correlations were not observed between maternal labels and child give gestures, proximal points, and distal points.

**Discussion**: Although our findings align with extant research that gesture use is limited in FXS, it appears that pointing by young children with FXS is a powerful signal that leads caregivers to provide them with clear, referential language input that names the object. Helping caregivers of young children with FXS notice, interpret, and respond to child points toward an object with a simple label for the object may be a pathway to promote word learning for these children.

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**Paper 3 of 3**

**Paper Title**: Delivering Enhanced Milieu Teaching to Toddlers with Down Syndrome via Hybrid Telepractice: A Single-Case Experimental Design

**Authors**: Emily D. Quinn[[6]](#footnote-6), Kim Kurin6, Alexandria R. Cook6, Ann P. Kaiser[[7]](#footnote-7)

**Introduction**: Children with DS have significantly poorer expressive language outcomes, including expressive vocabulary, grammar skills, and slower rates of growth than children with other intellectual and developmental disabilities (Romano et al., 2020, Warren et al., 2020). Early speech-language intervention can mitigate communication challenges by supporting children’s participation in daily activities and by teaching them foundational language skills such as commenting, requesting, and following directions (Kaiser & Roberts, 2013; Wright & Quinn, 2016). This pilot study examined the feasibility of delivering a naturalistic language intervention, Enhanced Milieu Teaching (EMT) tailored for children with DS, through hybrid telepractice.

**Method**: In this multiple baseline design across behaviors study, a speech-language pathologist (SLP), taught EMT-DS to three caregivers and their children with DS (22 – 40 months) using a hybrid service delivery model. Sessions were conducted in person and via telepractice. The SLP taught caregivers EMT-DS emphasizing the use of (a) four target EMT strategies: matched turns, expansions, time delays, and milieu teaching episodes, (b) augmentative and alternative communication AAC (manual signs, speech generating device), and (c) aided AAC modeling. The SLP provided caregiver instruction following the Teach-Model-Coach-Review approach. Caregiver outcomes were the accuracy (primary) and frequency (secondary) of EMT strategy use. Child outcomes were exploratory and included the rate of symbolic communication acts, weighted number of communication acts, and number of different words (NDW).

**Results**: There was a functional relation between the intervention and the accuracy and frequency of EMT strategy use for all three caregivers. All caregivers showed an increase in the accuracy for all four target strategies. Caregivers also increased the frequency of the three EMT strategies: expansions, time delays, and milieu teaching episodes. There were no changes in the frequency of matched turns. Caregiver use of EMT strategies maintained for six weeks post-intervention. After caregivers learned EMT strategies, gradual increases in the rate of symbolic communication acts and NDW occurred for all three children.

**Discussion**: Results demonstrate the preliminary efficacy of using a hybrid service delivery model to teach caregivers EMT-DS. Caregivers use of EMT strategies may result in small increases in children's rate of symbolic communication and NDW after their caregivers learned to use EMT strategies. Caregivers’ use of AAC modeling improved throughout the intervention and increased during the maintenance sessions. These improvements may suggest that as the caregivers gained proficiency with the EMT strategies, they expanded their AAC modeling. This approach may be advantageous for early intervention programs and healthcare centers interested in expanding access to language interventions tailored for children with DS and increasing treatment intensity during a critical period for language learning. While the cumulative effect of EMT and increased AAC modeling may have accelerated child language growth, it is crucial for future research to explore the active ingredients of interventions.

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