



Parental Gestures and Their Role During Social Interactions with Deaf, Autistic and Typically Developing Children

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Background

- ❖ Parents Gesture facilitates child development.
 - ❖ Increased infant gesture production, when parents produced gestures (Namy et al., 2000).
- ❖ Why are gestures beneficial?
 - ❖ Reflect speakers' thoughts, influence the course of learning, "building blocks" to develop a language (Goldin-Meadow & Alibali, 2012).
- ❖ Parents alter their gestures based on their child's age (Brand et al., 2009), object knowledge (Dimitrova & Moro, 2013), language development and communication (Iverson et al., 1999).
- ❖ Attention in Autistic Kids
 - ❖ Focus on noobjects (Tenenbaum et al., 2014) and non-face stimuli (Arkush et al., 2013) more, arrower visual field (Yamamoto & Kakutani, 2001).
- ❖ Attention in Deaf Kids
 - ❖ Focus attention on hands, specifically signs during interactions (Spencer, 2000), Periphery visual attention (Dye et al., 2009).
- ❖ Parents adapt their gestures to maximize communication success for children with language difficulties (Wray & Norbury, 2018).
 - ❖ Mothers of children with high risk for autism gesture more frequently during interactions (Talbot & Tager-Flusberg, 2015, Wray & Norbury, 2018)
 - ❖ Parents of deaf children establish a system of gesture based communication (Goldin-Meadow et al., 2007), use classifier signs that are a mix of gestural and linguistic elements (Schembri et al., 2005), and have Increased gesture usage (Kanto et al., 2014) and complexity (Massimino & Van Deusen Phillips) in interactions with deaf children.
- ❖ **Does frequency of gestures used by parents vary between typical developing, autistic and deaf kids?**
- ❖ **Does the intrinsic quality of the gestures vary between those same populations? Specifically, whether they use an object during the gesture or hands or both.**
- ❖ **Is this altered gesturing contributing to greater sustained attention?**

Hypothesis

Deaf parents have increased gestures compared to ASD parents because their way of communication is based on ASL which contains gestures. However, both Deaf and ASD group parents have increased gestures compared to TD. ASD group parents gesture more frequently using objects to accommodate for their children's communication difficulties. The role of gesture on the attentional experiences, such as sustained attention, will be observed.

Methods

PARTICIPANTS

- ❖ Age range: 36 - 60 months
- ❖ 5 Typically developing (Control)
- ❖ 5 Autistic
- ❖ 5 Deaf
- ❖ Parents of each participant were asked to fill out MCDI and SES forms.

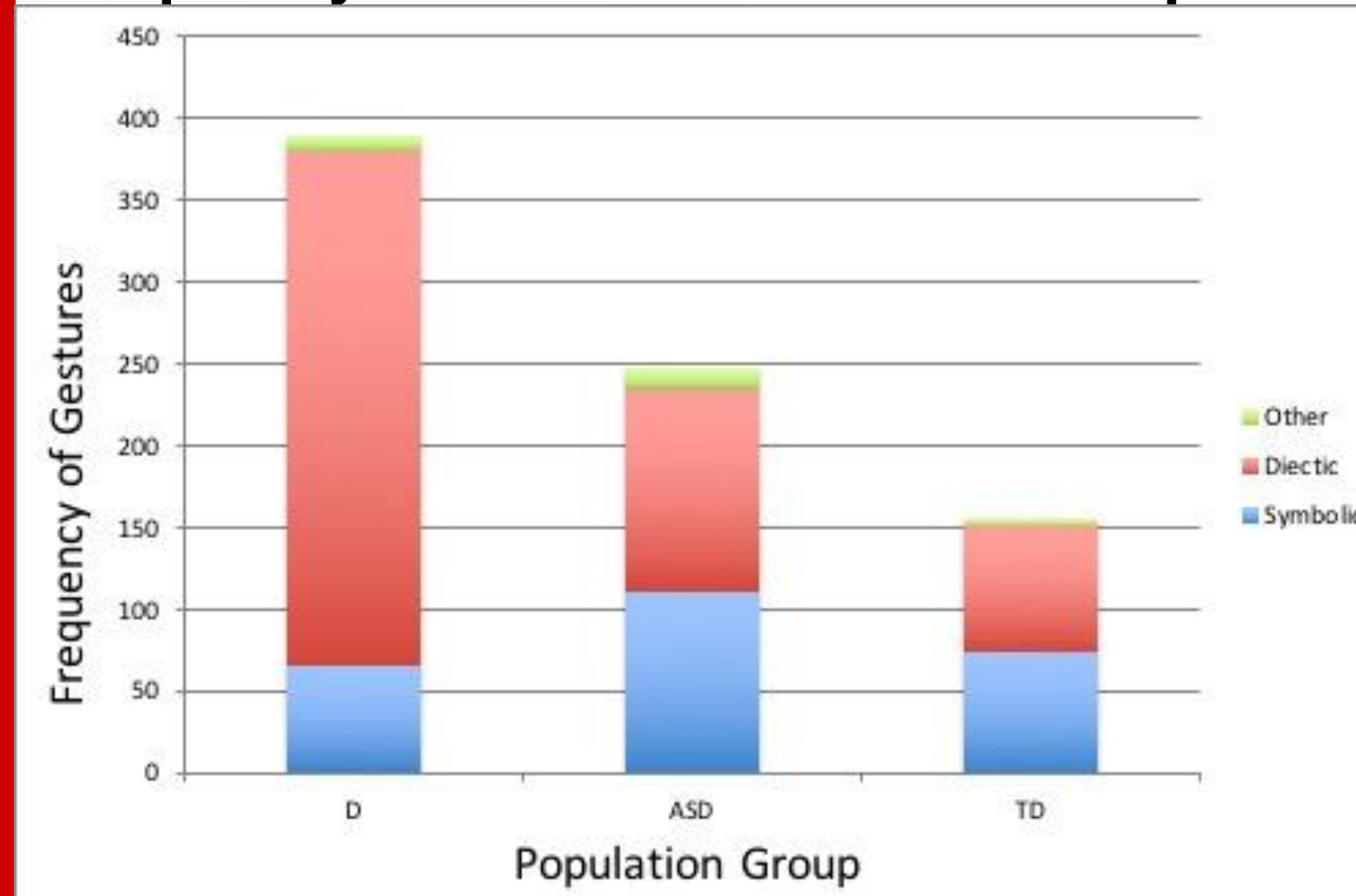
PROCEDURES

A semi-naturalistic play session between parent and child. Parent and child sit on adjacent sides of the table and the parents are asked to teach the names of a set of objects to their children like they would at home. Given 40 seconds for each word, an audio recording indicated when to move on to the next word. 16 total objects, each associated with a noun or a verb. (8 common words, 8 unfamiliar words). Interactions are recorded - overall view of play session, child head camera.

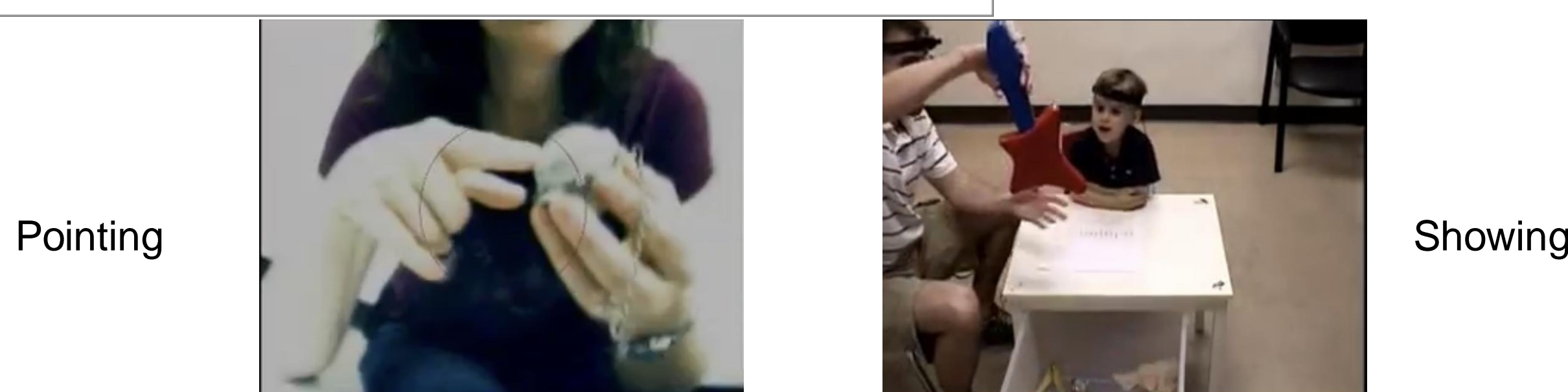


Results

Frequency of Gestures in Each Group

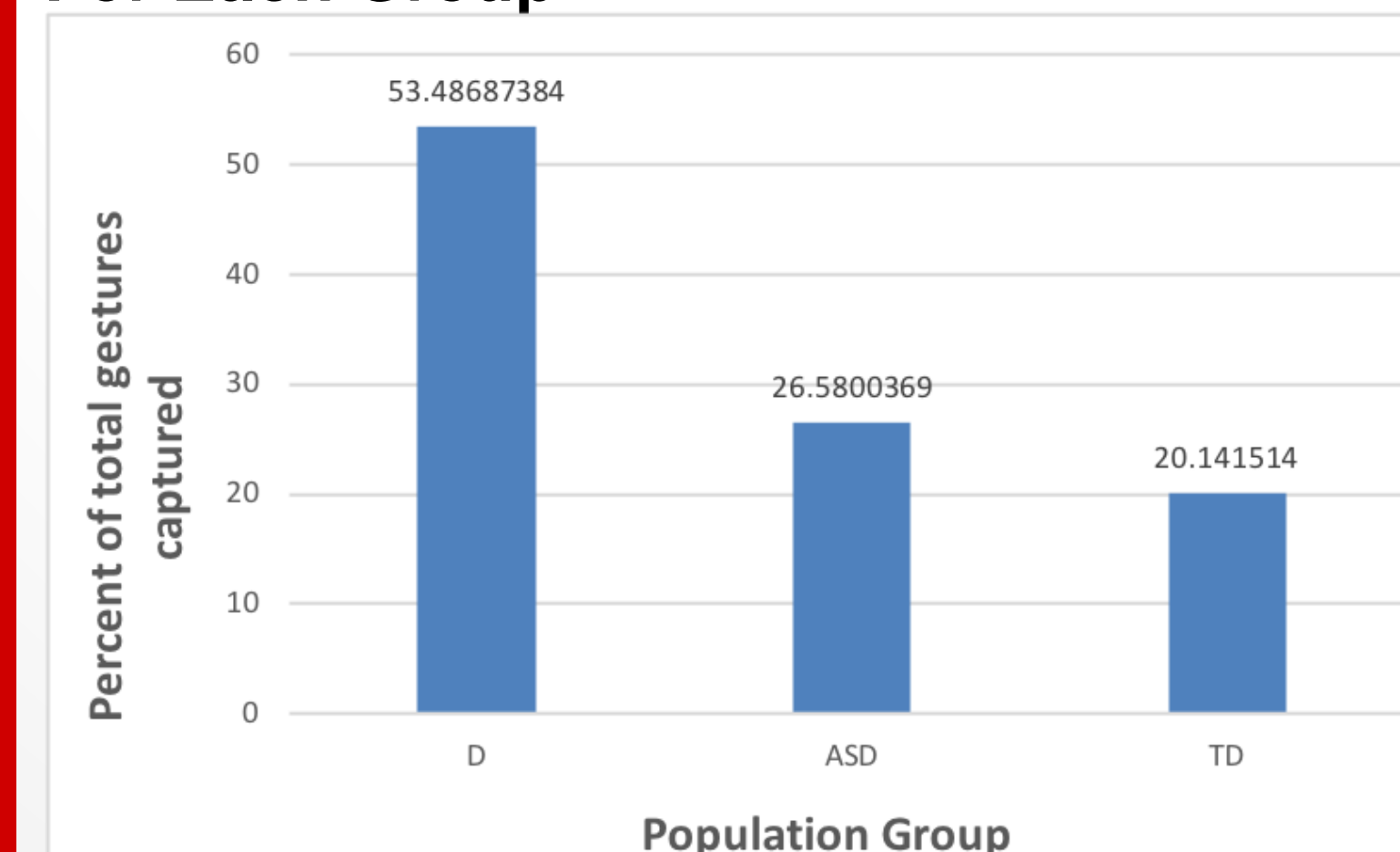


- ❖ Majority of the gestures were deictic gestures for all groups, specifically pointing and showing.
- ❖ D group had gestures with shorter durations compared to ASD and TD, on average 1485.24 MS per gesture.
- ❖ Most of the gestures produced used objects for all groups, with significant differences between groups, $F(2,12) = 13.3, p < 0.001$.



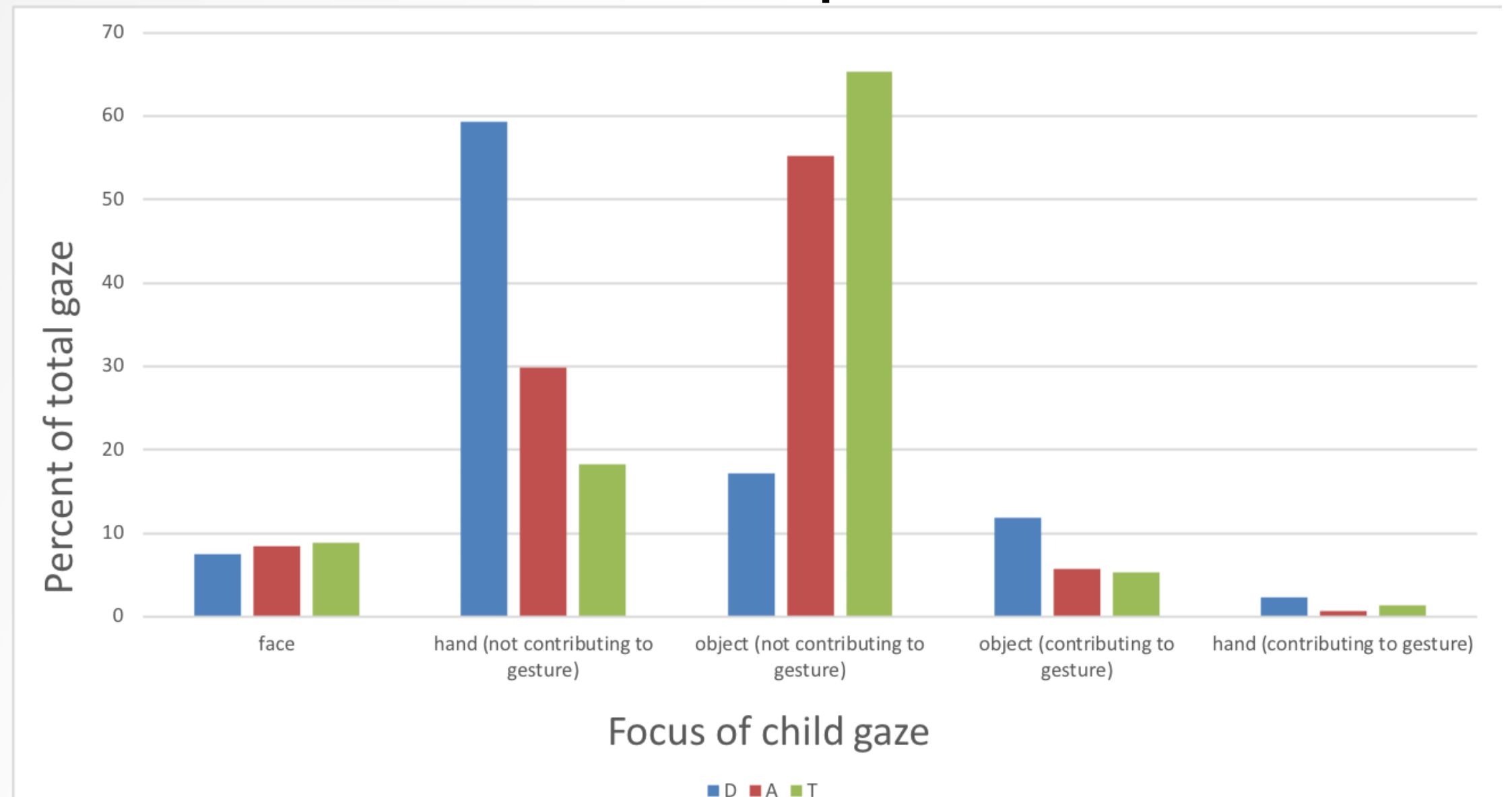
ANOVA results reveal significant difference between the groups for total gestures $F(2,12) = 15.7, p < 0.001$. Significant differences were also observed in frequency of deictic gestures between groups $F(2,12) = 13.8, p < 0.001$.

Percent of Total Gestures Captured For Each Group



- ❖ D group had significantly higher rate of capture for gestures $F(2,12) = 8.43, p < 0.03$, compared to ASD and TD.
- ❖ D group also had greatest amount of sustained attention compared to ASD and TD

Gaze Distribution For Each Group



- ❖ D group spent a significantly greater amount of time looking at hands $F(2,12) = 29.7, p < 0.001$.
- ❖ ASD group spent a significantly greater amount of time looking at objects $F(2,12) = 27.7, p < 0.001$.
- ❖ Gestures with objects captured attention more than gestures with hands

Discussion

This study's purpose was to explore how parents with children that have variable learning visual and learning experiences gesture and how that correlates with their child's attention. Previous research on the matter lacked a naturalistic environment and a comparison of these specific population groups. The hypothesis was supported by the findings as D group parents gestures most frequently. Parents of deaf children tend to use more visual forms of communication and are more skilled in it (Meadow-Orlans & Spencer, 1996) compared to parents of hearing children (Lederberg & Everhart, 1998). D group children captured a greater number of gestures compared to ASD and TD since deaf children have selective enhanced vision due to a reorganization of multisensory areas, ranging from higher-order cortex to early cortical areas (Dye et al, 2006). Deaf children learn to gesture and learn ASL from interactions with parents. Those gestures allow them to communicate and develop their language skills (Hoemann, 1972). ASD group parents gestured more frequently than TD group parents as ASD children recognize gestures better than verbal requests (Medeiros & Winsler, 2014). However, they still gestured less than D group parents as interactions of parents with children diagnosed with Autism later in life tend to have fewer gestures. ASD group children captured a smaller amount of the gestures as they have a narrower visual field (Yamamoto & Kakutani, 2001) and difficulty attending to stimuli in various locations around them (Yamamoto & Kakutani, 2001). Overall parents seem to alter gestures based on their children's attentional learning. Having eye-tracking would be very beneficial for future work to potentially develop interventions.

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