**Title**: Language dysfluency and working memory among mothers of children with fragile X syndrome and autism spectrum disorder

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**Introduction**: Research aiming to characterize the language and cognitive profile of females with the *FMR1* premutation is growing, with studies suggesting that the *FMR1* premutation is associated with deficits in executive function (EF) skills (Shelton et al., 2016) and language (Sterling et al., 2013; Maltman et al., 2021). Some studies have investigated differences in performance on behavioral tasks measuring working memory (Shelton et al., 2015) or on self-reported measures of EF (Movaghar et al., 2017), but few have looked at both performance on behavioral tasks and self-reported skills in the same group. Regarding language, prior research indicates that females with the *FMR1* premutation demonstrate differences in lexical diversity (Schmitt et al., 2022), word-retrieval (Brendin-Oja, 2021), and dysfluency (Movaghar et al., 2017; Sterling et al., 2013) compared to controls. Critically, EF deficits have been related to dysfluency production in other populations (Engelhardt et al., 2010, 2019). Few studies have examined the relationship between language and EF in premutation carriers or have considered the effect of different language sampling procedures. Thus, the aims of the current study are: 1) examine differences in dysfluency across language sampling contexts between females premutation carriers and a control group of age-matched mothers of autistic children and 2) examine how executive function skills, namely working memory, impact dysfluency in these two groups across language sampling contexts.

**Method**: Participants included 18 *FMR1* female premutation carriers and 17 biological mothers of autistic children. Participants were matched on chronological age (*d* = -0.02, variance ratio = 1.88, *p* = 0.945) and education (*d* = -0.10, variance ratio = 0.80, *p* = 0.774), and all had a son between the ages of 9-18 years. Self-reported EF skills were collected using the Behavior Rating Inventory of Executive Function – Adult Version (Roth et al., 2013), and standard scores from the Working Memory domain was used in analyses. Mothers also completed computerized N-back tasks (Ellis Weismer et al., 2017) using E-Prime software as a direct assessment of working memory, with percent accuracy as the dependent variable. Language samples were elicited in two contexts: monologue and dialogue. During the monologue sample, mothers were instructed to speak uninterrupted about their child for five minutes (Magana et al., 1986). This language elicitation task has been used and validated on female premutation carriers (Sterling et al., 2013; Movaghar et al., 2017). For the dialogue sample, mothers engaged in a conversation with an examiner for 10 minutes (Abbeduto et al., 2020). All language samples were transcribed using the Systematic Analysis of Language Transcripts software. Following the coding variables from Sterling et al. (2013), dysfluency variables included abandoned utterances, revisions, repetitions, filled pauses, and a total dysfluency score yielding the sum of abandoned utterances, revisions, and repetitions. Data collection is complete and analyses are in progress.

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| **Table 2**  *Descriptive results for working memory tasks* | | |
|  | FXS (*n* = 18)  Mean (SD) | ASD (*n* = 17)  Mean (SD) |
| BRIEF-A T-Scores  Working Memory  N-Back Task % Accuracy  0-back  1-back  2-back | 58.56(11.78)  .98(.05)  .93(.08)  .72(.12) | 54.35(10.39)  .97(.06)  .97(.03)  .71(.12) |

**Results**: Given our small sample size we have opted for non-parametric tests. We will conduct Wilcoxon Rank-Sum Tests to assess group differences and Wilcoxon Signed-Rank tests to assess within group differences across sampling contexts. The tables below display the means and standard deviations for the variables for the two groups. The dialogue samples were roughly twice as long as the monologue samples (10 vs. 5 minutes) and should be interpreted accordingly.

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| **Table 1**  *Participant Information* | | |
|  | FXS (*n* = 18)  Mean (SD) | ASD (*n* = 17)  Mean (SD) |
| Maternal Age  Maternal Education | 44.61 (5.11)  6.39 (1.65) | 44.47 (7.01)  6.24 (1.48) |
| *Note*: Maternal education, 6 = BA/BS | | |

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| **Table 3**  *Descriptive results for verbal dysfluency measures* | | | | |
|  | FXS (*n* = 18)  Mean (SD) | | ASD (*n* = 17  Mean (SD) | |
|  | Monologue | Dialogue | Monologue | Dialogue |
| Abandoned Utterances  Revisions  Repetitions  Filled Pauses  Total Dysfluencies | 1.78 (1.83)  8.33 (5.18)  5.89 (5.83)  25 (13.85)  16 (9.86) | 7.23 (4.65)  21.61 (9.46)  13.78 (11.98)  41.56 (19.78)  42.67 (22.07) | 3.35 (3.28)  10.18 (6.39)  6.65 (6.36)  29.24 (16.99)  20.18 (10.67) | 13.12 (7.11)  31.41 (13.99)  13.59 (9.04)  45.24 (22.59)  58.12 (20.73) |

**Discussion:** Consistent with previous research (e.g., Movaghar et al., 2017), preliminary findings suggest that relative to mothers of autistic children, premutation carriers report greater difficulty with EF on the BRIEF-A. Interestingly, our preliminary findings do not yet indicate differences in dysfluency in the monologue condition between the groups as seen in prior studies (e.g., Sterling et al., 2013), though additional analysis is warranted. Both groups demonstrate more dysfluencies across all variables in the dialogue versus monologue conditions, which is consistent with previous research (e.g., Oviatt, 1995) and indicates the importance of capturing and understanding differences in language samples across a range of contexts. Future analyses will continue as described to address our aims. These findings will contribute to the growing body of work targeted at analysing language and cognitive characteristics of females with the *FMR1* premutation.

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