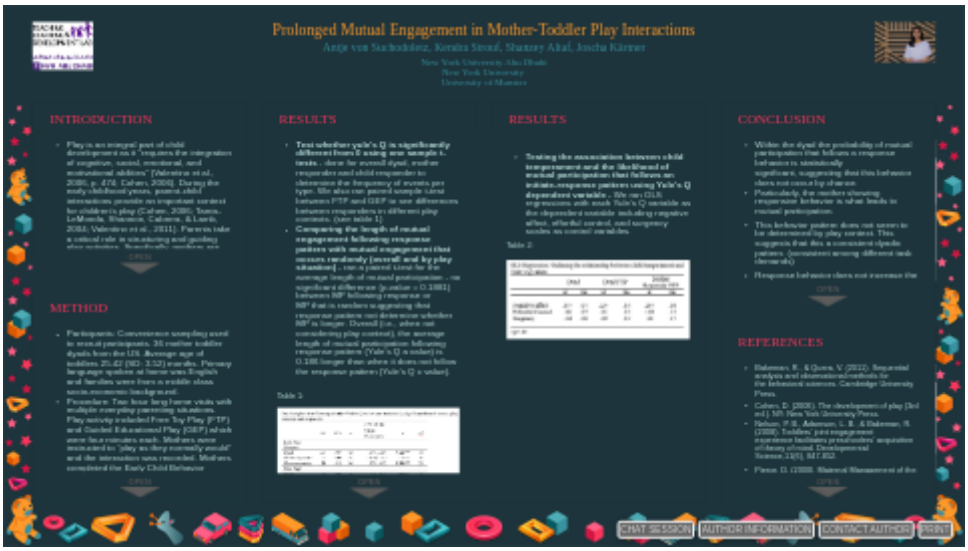
Prolonged Mutual Engagement in Mother-Toddler Play Interactions



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PRESENTED AT:

INTRODUCTION

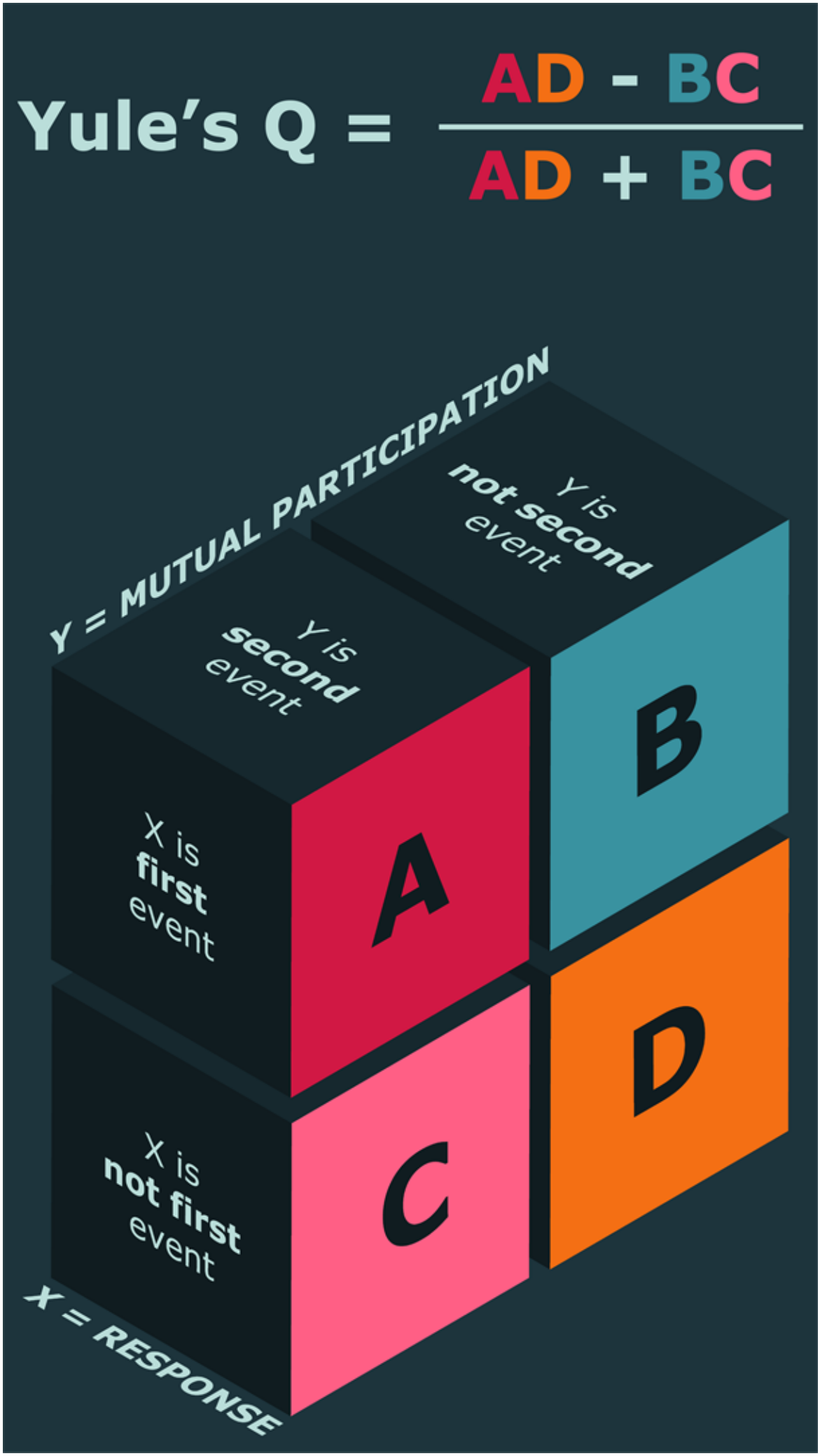
- Play is an integral part of child development as it "requires the integration of cognitive, social, emotional, and motivational abilities" (Valentino et al., 2006, p. 474; Cohen, 2006). During the early childhood years, parent-child interactions provide an important context for children's play (Cohen, 2006; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004; Valentino et al., 2011). Parents take a critical role in structuring and guiding play activities. Specifically, mothers are considered to be stage managers behind the play interaction where they are constantly engaged with their toddlers (Pierce 2000).
- The present study focuses on prolonged play interactions between mothers and toddlers. We define an interaction as a discrete sequential event during play. Within these dyadic interactions, the present study concentrates on periods of mutual engagement. Conceptualized as both verbal and nonverbal "active participation" (Vandermaas-Peeler et al., 2003), as well as the "active sharing of an object or event" (Nelson et al., 2008, p.2), mutual engagement is the result of one partner responding to the other's behavior during play.
- The purpose of this study was to investigate:
  - the likelihood of response patterns leading to periods of prolonged mutual engagement and whether there are differences between responders (mother or child) and play contexts.
  - child temperament in relation to the likelihood of prolonged mutual engagement that follows a response pattern.

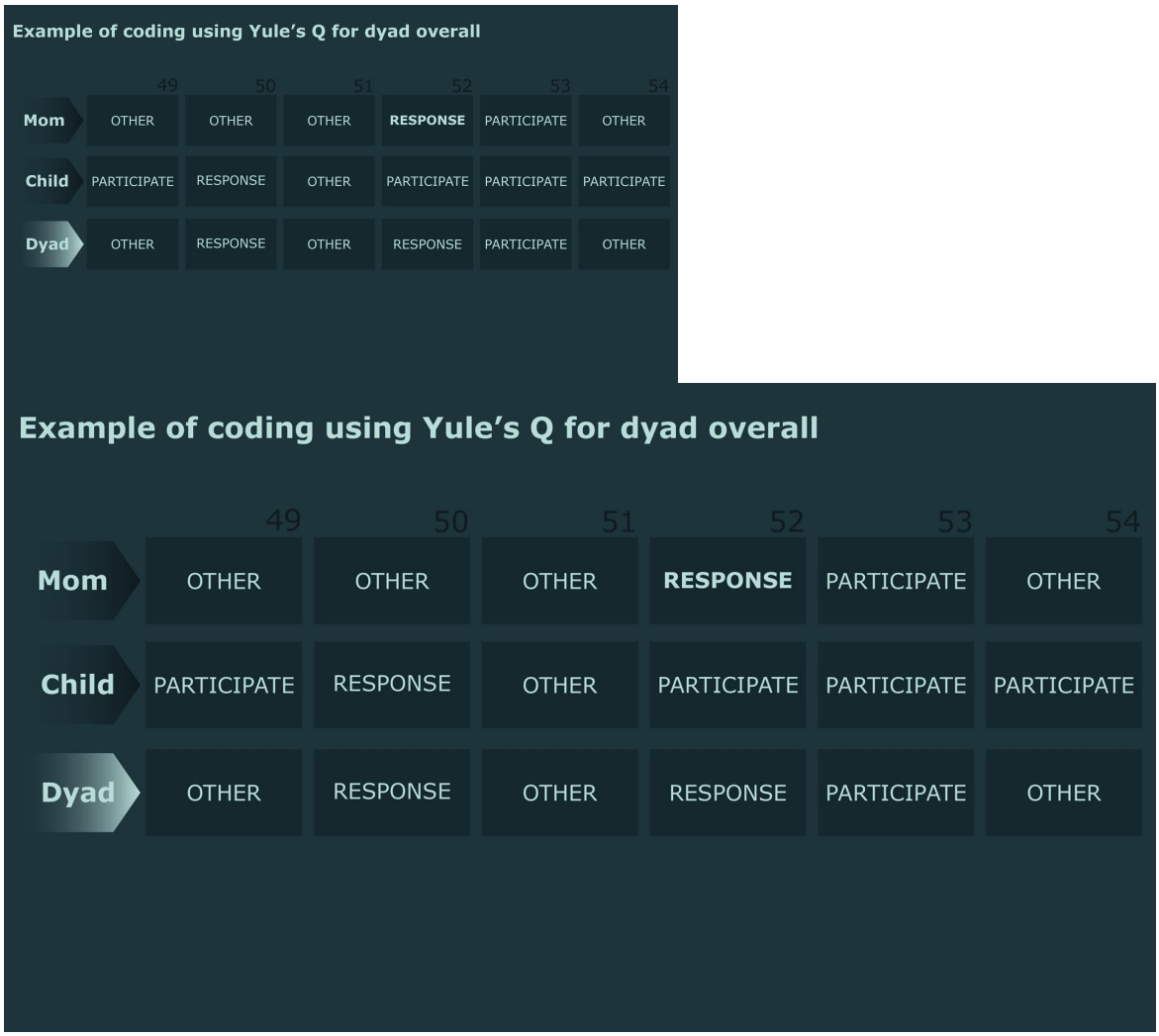
METHOD

- Participants: Convenience sampling used to recruit participants. 36 mother toddler dyads from the US. Average age of toddlers 25.42 (SD: 3.52) months. Primary language spoken at home was English and families were from a middle class socio-economic background.
- Procedure: Two hour long home visits with multiple everyday parenting situations. Play activity included Free Toy Play (FTP) and Guided Educational Play (GEP) which were four minutes each. Mothers were instructed to "play as they normally would" and the interaction was recorded. Mothers completed the Early Child Behavior Questionnaire (ECBQ - Very Short Form) to assess aspects of child temperament: negative affect, effortful control and surgency.
- Behavior coding of mother-toddler interaction:
  - Coding was done using Mangold INTERACT software. Videos were broken into 2 second intervals (120 intervals). Each interval was assigned a code of "response" (following the behavior of partner [verbal or nonverbal] as well as imitating, describing, complying) and "participation" (engaging with the play activity and just playing). All other behaviors were coded as "other".
  - Coding was done for mother and child separately.
  - Mutual participation: when both mother and child behaviors were coded participation within the same interval.

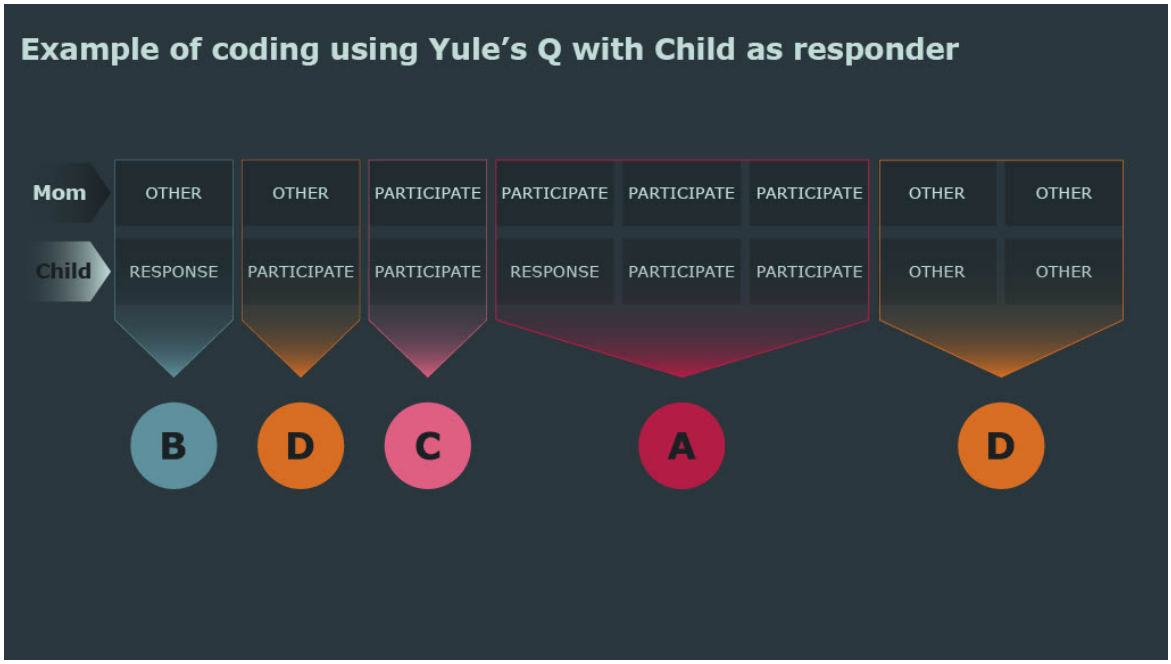
Calculating Yule's Q:

- We calculated transitional probabilities using Yule's Q (Bakeman & Quera, 2011; Lloyd, Yoder, Tapp & Staubitz, 2016).
- Yule's Q reflect the probability that a "response" (X) is followed by "mutual engagement" (Y)
- Yule's Q was calculated per dyad, by responder (mother or child) and by play context (FTP and GEP).


Yule's Q = AD - BC / AD + BC
Y = MUTUAL PARTICIPATION
Y is second event
Y is not second event
X is first event
X is not first event
A
B
C
D
X = RESPONSE



This is an example of a behavioral sequence that was coded for the dyad across both play contexts. If either the mother or child exhibited responsive behavior, the dyad was coded as response, or X; and the dyad was coded as participate, or Y, if they were mutually participating in the play activity.



This behavioral sequence was coded when the child is the responder in a play context. In the first event shown, a B was assigned because it shows an X event not followed by a Y event. A 'C' event represents a Y pattern not following an X pattern. We see D events do not capture the X-Y pattern, and A indicates a child's responsive behavior is followed by mutual participation.

RESULTS

- **Test whether yule's Q is significantly different from 0 using one sample t-tests** - done for overall dyad, mother responder and child responder to determine the frequency of events per type. We also ran paired sample t-test between FTP and GEP to see differences between responders in different play contexts. (see table 1)
- **Comparing the length of mutual engagement following response pattern with mutual engagement that occurs randomly (overall and by play situation) -** ran a paired t-test for the average length of mutual participation - no significant difference (p-value = 0.1881) between MP following response or MP that is random suggesting that response pattern not determine whether MP is longer. Overall (i.e., when not considering play context), the average length of mutual participation following response pattern (Yule's Q a value) is 0.186 longer than when it does not follow the response pattern (Yule's Q c value).

Table 1:

One-Sample t-test: Testing whether Yule's Q values are statistically significant from 0 across play contexts and responder

	M	SD	n	95% CI for Mean Difference	t	df
Both Play Contexts						
Dyad	.26	.297	36	.162, .363	5.305**	35
Child responder	.18	.599	36	-.024, .381	1.787+	35
Mom responder	. 30	. 406	36	.160, .435	4.394**	35
Free Play						
Dyad	.24	.544	36	.060, .428	2.689*	35
Child responder	.19	.619	36	-.023, .395	1.804+	35
Mom responder	.24	.649	36	.017, .456	2.182*	35
Guided Play						
Dyad	.22	.335	36	.105, .331	3.905**	35
Child responder	-.03	.693	36	-.269, .200	-.296	35
Mom responder	.23	.444	36	.077, .377	3.07*	35

+p<.10; * p<.05; **p<.001

RESULTS

- **Testing the association between child temperament and the likelihood of mutual participation that follows an initiate-response pattern using Yule's Q dependent variable -** We ran OLS regressions with each Yule's Q variable as the dependent variable including negative affect, effortful control, and surgency scales as control variables.

Table 2:

OLS Regression: Outlining the relationship between child temperament and Yule's Q values

	Dyad		Dyad FTP		Mother Responder FTP	
	B	SE	B	SE	B	SE
Negative affect	.14+	.07	.23+	.14	.29+	.16
Effortful Control	.06	.07	.01	.13	-.00	.15
Surgency	-.06	.08	.09	.14	.16	.17

+p<.10

CONCLUSION

- Within the dyad the probability of mutual participation that follows a response behavior is statistically significant, suggesting that this behavior does not occur by chance.
- Particularly, the mother showing responsive behavior is what leads to mutual participation.
- This behavior pattern does not seem to be determined by play context. This suggests that this a consistent dyadic pattern. (consistent among different task demands)
- Response behavior does not increase the likelihood of MP as expected, but MP also seems to happen "randomly".
- Higher negative affect is associated to a higher probability of a response behavior leading to mutual participation.

  These results could suggest that mother's feel the need to be more responsive to their children and engage them more in play when their children are high in negative affect

Future Directions:

- Study replicated in 3 other cultural contexts - look at cultural differences in responsiveness and play engagement.
- Look at alternative behavior patterns that may lead to mutual participation e.g. teaching behaviors.

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Antje von Suchodoletz is an Assistant Professor of Psychology at New York University Abu Dhabi (UAE) where she leads the Teaching, Learning and Development Lab (https://nyuad.nyu.edu/en/research/faculty-labs-and-projects/teaching-learning-and-development-lab.html). Her research is focused on early childhood development, caregiver-child interactions, parenting and socialization goals, teaching and education, and children's academic achievement.

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