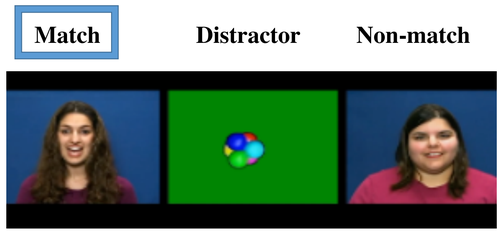
Maternal Intrusiveness and Multisensory Integration are Negatively Related in Older Infants

Caroline Taylor, Madeleine Bruce, & Robin Panneton

What were we interested in?

Multisensory integration (MSI) involves the ability to differentially attend to information that is temporally and spatially aligned - that is, it has **high intersensory redundancy**.

Recently, we found that 24-month-olds' attention to an AV match predicted their vocabulary size, but only during a **social condition** (female speakers) where the competition for their attention was high. During the analogous **non-social condition**, attention to the AV match did not predict vocabulary.



Infant Vocabulary

To understand this condition-specific relationship, we measured maternal sensitivity during a free play situation to explore whether this was related to infants' MSI. We expected maternal sensitivity to be positively correlated with infant MSI given that more experience with contingent, responsive, positive face to face play should promote maintaining attention to AV correspondence, especially with female faces+voices.

What did mothers do?

Mothers completed a 10-minute **free play task** with their infants. Mothers were asked to play naturally with their child with any of 3 objects.

Maternal Sensitivity (MSen)

Maternal Sensitivity Attributes			
Attention facilitation	*Intrusiveness	Positive affect	*Negative affect

Composite Score		
4-point scale	(1- low, 4 – high)	Range = 4-16

*Reverse scored

What did toddlers do?

Multisensory Attention Assessment Protocol (MAAP; Bahrick, Todd, & Soska, 2018)

N = 32 infants (22 female infants), Age = 22-27 months (M=23 mo, SD = 1.51)

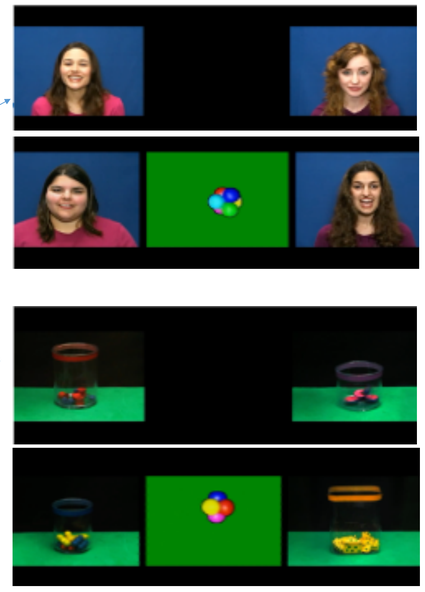
Conditions

Social + no distractor

Social + distractor

Non-Social + no distractor

Non-Social + distractor



Toddlers watched short clips (12 seconds) of two events with only **one audiovisual (AV) match**; order counterbalanced; each trial type presented 6x for 24 total trials.

Match Ratio 1 Match / Match + Non-Match

Match Ratio 2 Match / Match + Distractor

What did we find about MSen and Vocabulary?

Expressive vocabulary (MCDI words and sentences) was positively correlated with some aspects of MSen (see table below).

	MCDI (Expressive)
Maternal Sensitivity	+.40 (p=.02)
Maternal Attention Facilitation	+.45 (p=.01)

What did we find about MSen and MSI?

First, there were no significant correlations between MSen and Match Ratios on trials with low competition and only marginally significant correlations on trials with high competition (see Table below).

Second, there were some significant correlations between Maternal Attention Facilitation and Maternal Intrusiveness with Match Ratios but only on trials with high competition (Match Ratio 2). No significant correlations with Maternal Negativity or Maternal Positivity.

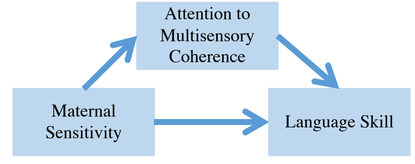
Third, Maternal Attention Facilitation and Maternal Intrusiveness were significantly negatively correlated (r = -.36, p = .04)

	Attention to Social Match v. Distractor
Maternal Sensitivity	+.34 (p=.06)
Maternal Attention Facilitation	+.34 (p = .05)
Maternal Intrusiveness	-.35 (p=.04)

What does this mean and where to from here?

Maternal Attention Facilitation promotes infants' sustained attention on **AV matched events (both objects and people)** - mothers who direct and guide attention during play are increasing infants' basic multisensory processing, but particularly when competition for attention is high.

Maternal intrusiveness demotes infants' sustained attention to **AV synchronized female speakers** - mothers who persistently disrupt infants' attention during play are decreasing infants' interest in important face+voice congruencies, but particularly when competition for attention is high.



It will be important to combine all these factors in a more comprehensive model to predict emerging language skills

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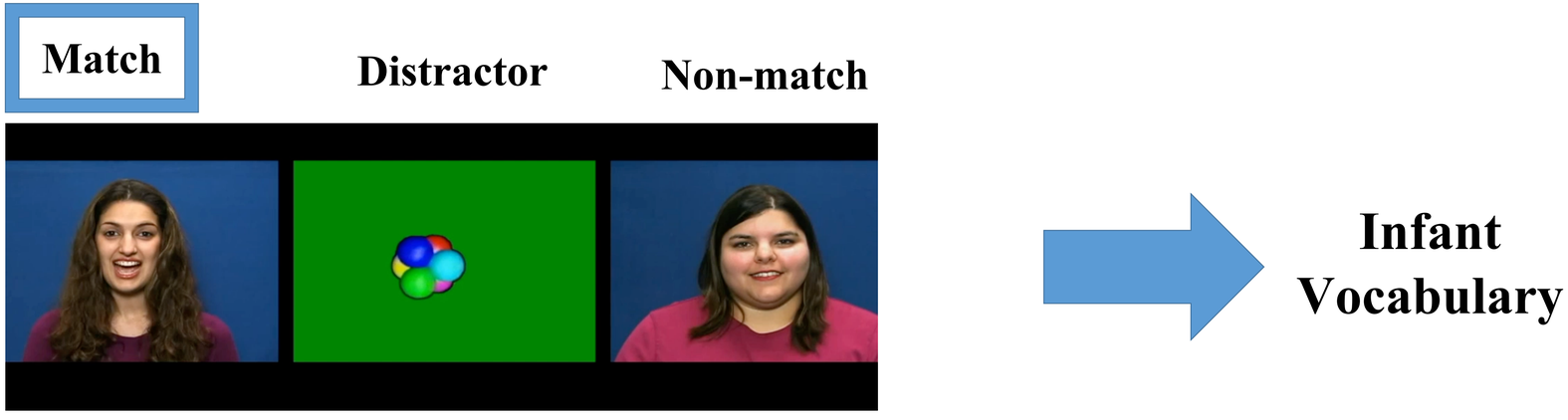

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What did the mothers do?

Maternal Sensitivity (MSen)

Mothers completed a 10-minute **free play task** with her infant.

Three toys were given to the mother-infant dyad and the sessions were offline coded to calculate maternal sensitivity.

Maternal Sensitivity Attributes			
Attention facilitation	*Intrusiveness	Positive affect	*Negative affect

Composite Score		
4-point scale	(1- low, 4 – high)	Range = 4-16

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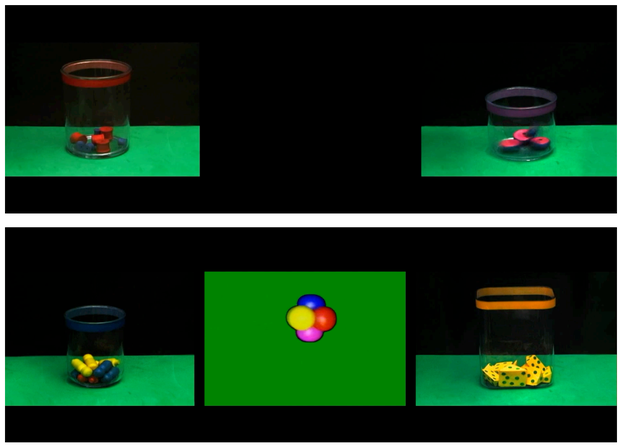
Match
Match + Non-Match

Match Ratio 2

Match
Match + Distractor

Social

Non-Social



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	Attention to Social Match v. Distractor	Attention to Non-Social Match v. Distractor
Maternal Sensitivity	+.34 (p=.06)	+.33 (p=.06)
Maternal Attention Facilitation	+.34 (p = .05)	+.36 (p=.04)
Maternal Intrusiveness	-.35 (p=.04)	-.08 (p=.68)

What does this mean and where to from here?

Maternal Attention Facilitation promotes infants' sustained attention on **AV matched events (both objects and people)** - mothers who direct and guide attention during play are increasing infants' basic multisensory processing, but particularly when competition for attention is high.

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