Cognitive and Language Development Lab

At

Montclair State University

Within the last year, your child participated in one of our research studies. We are writing, first of all, to THANK YOU for your participation. We couldn't do our research without your help and we really appreciate your interest! We also wanted to let you know what we, as researchers, learned from the studies we conducted. In this newsletter, you will read about the results of different studies that we have completed in our lab over the past year.

If you have any questions about these studies or the lab in general, please feel free to call us at (973)-655-4045 or email us at Lakustalab@gmail.com. We also have a webpage for the lab where you can find out more about our studies:

msudevlab.com

Friend us on Facebook! https://www.facebook.com/laura.lakusta/

Also, if you found this experience to be positive and would like to recommend our studies to other parents with young children, we would be ***grateful!*** We are always looking for new participants! We hope to have you come visit for more studies soon! **Thank You!**

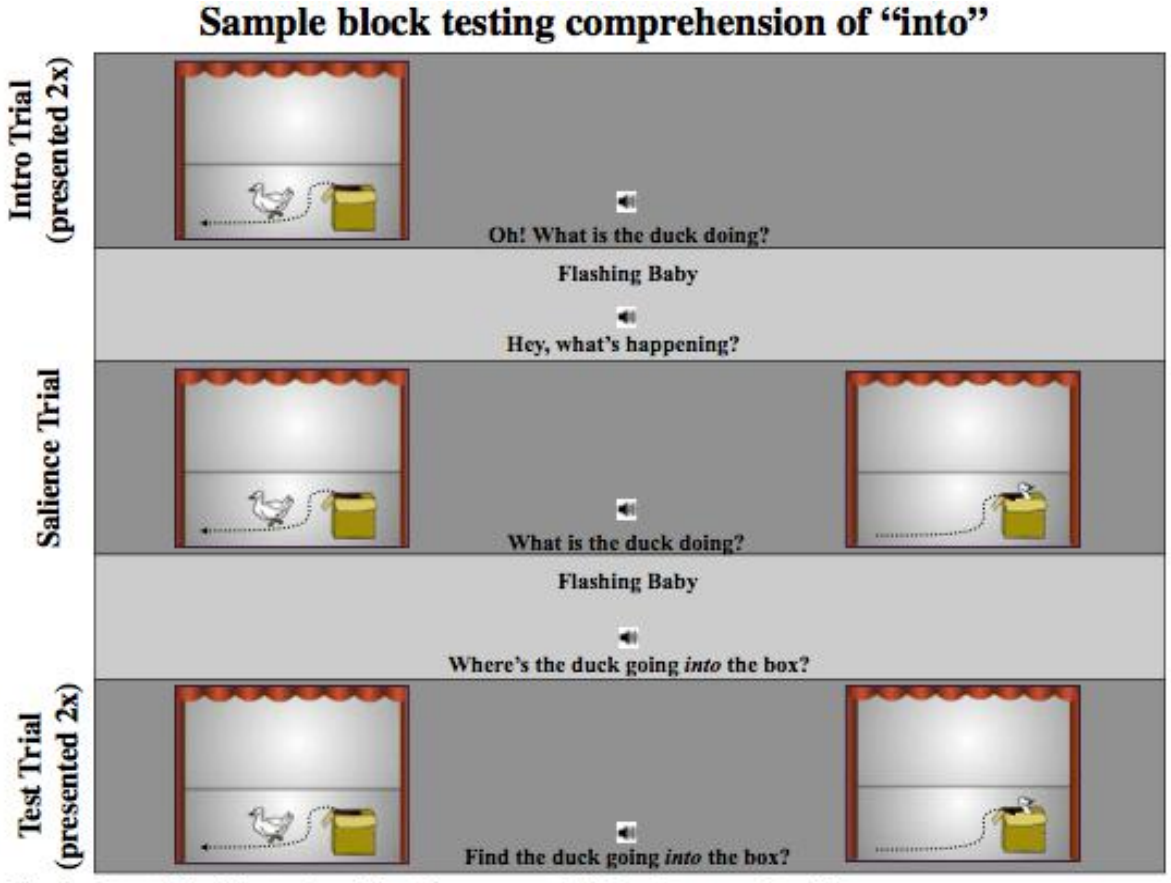
COMPREHENSION OF SPATIAL PREPOSITIONS

Over the past year, we have continued to explore language acquisition in infants and young children. More specifically, we are exploring whether infants comprehend prepositions marking endpoints ("to", "into", "on", and "next to"). Recently, we tested 18-month olds' comprehension of spatial prepositions and are now recording responses in 21.5- through 24.5 month-olds.

At the start of the study, to further explore early language acquisition, we asked the guardians of each infant participant to complete a checklist called the MacArthur Bates Communicative Development Inventory. This checklist allows the guardian to report the infant's comprehension and production of various English terms such as, 'into', 'on', and 'to'. We have found that 18- and 21.5- to 24.5-month-old infants are reported to have higher comprehension of the preposition 'on' and 'in' compared to the other prepositions, such as 'to'. This research expands our knowledge of what children understand before they speak fluently.

In order to directly measure infants' language comprehension of spatial prepositions, we developed a study that uses a method called the 'intermodal preferential looking paradigm' (IPLP). In this method, infants are shown two movies that play simultaneously with audio that describes only one of the movies accurately.

For example, infants hear "find the duck walking into the box", while viewing two movies: a duck walking into the box and a duck walking out of the box (see picture below). If infants understand the spatial term that was said, we expect infants to look longer at the screen matching the audio (the duck walking into the box). Our results suggest that 18-month-olds understand the spatial preposition "on" when it refers to a dynamic motion event, and are beginning to understand the spatial preposition "to." 21.5- to 24.5-month-olds comprehend "on" as well as "to" . This research was presented at the Eastern Psychological Conference in March 2018.

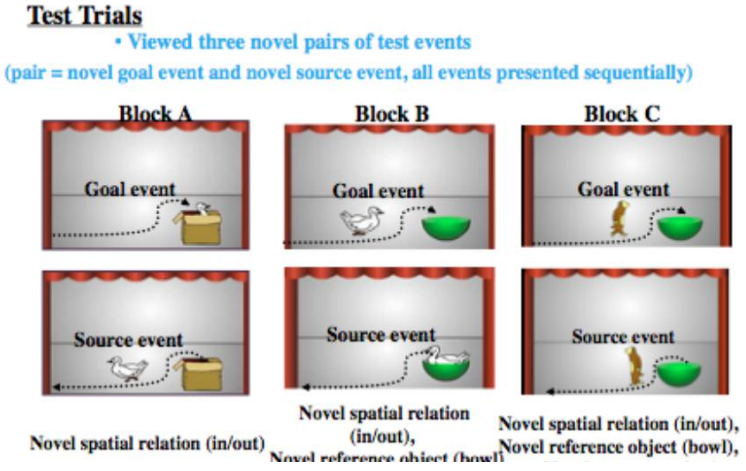


Note that infants were shown dynamic events (not static pictures). These two pictures portray a duck moving out of or into a box.

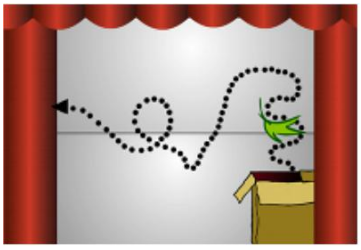
CATEGORIZATION OF GOAL MOTION EVENTS

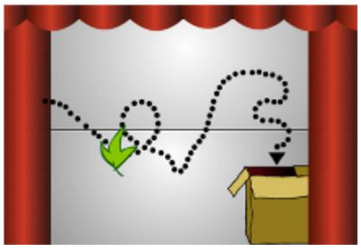
Based on past findings, infants can distinguish the difference between goal (endpoint; e.g., duck walking to tree) and source events (starting point e.g., duck walking away from tree), and prefer to look at goal over source events. However, the question of how infants conceptualize these goal and source events is yet to be explored. We wanted to know if infants represent endpoints in varying events as belonging to one unitary concept of 'goal'. In other words, do infants think of two different events of a duck walking *to a tree* and a duck going *onto a block* as related because they contain an endpoint? This is similar to how a Dalmatian and Golden Retriever are represented under the category of 'dog' but are of different breeds.

Using a modified version of the preferential looking paradigm (described above), in one recently completed study, 18-month old infants were presented with two different simultaneous side-by-side displays, one showing a goal path (in-category event, e.g., a duck going into a box) and one a source path (out of category event, e.g., a duck going out of a box). We recorded how long infants looked at these displays. Infants were then shown videos that included the goal paths "onto" and "next to" (see 'familiarization trials' depicted below), and then they were presented with the same two simultaneous videos that they were shown before the familiarization events (one goal path event paired with one source path event). If infants categorize goal path events during familiarization, they may attend more (and thus look longer) at the out of category source path events after familiarization.



In addition, we are also exploring if 18-month-old infants represent endpoints in varying events as belonging to one unitary concept of 'goal', with *inanimate objects* moving, such as a leaf going to a box or a leaf going onto a block. These events are different from events with a 'duck' moving' because inanimate objects such as leaves (tissues, etc.) cannot move on their own. Research has shown that infants younger than 12 months can represent the distinction between animate and inanimate object motion, and thus it is a question of interest whether they will reason about the endpoint in an event similarly in animate and inanimate motion events. Using the same design as described above (but with an inanimate leaf and tissue, see figure below), we found that 18-month-olds show evidence for categorizing goal path motion events with inanimate objects when test events are the most different from the familiarization events. These results are currently being analyzed and will be submitted for presentation at a professional conference this upcoming year.





Infants' Categorization of Support Configurations

Support is one of the earliest spatial relations that infants understand. Support is typically thought of as a figure object being supported from below by a solid ground object like a rubber duck on top of a box; However, this definition of support is narrow and does not include other kinds of support configurations that exist in the world, such as adhesive support (a sticker on a car), suspension/ hanging (picture on a wall), and embedding (polka dots on boots).

In this study, we ask how infants categorize support. One possibility is that early in development, infants' core representation of support is 'support from below'. This means that the earliest understanding of support is 'support from below' and only later in life do children gradually add other types of support relationship to their category of support.

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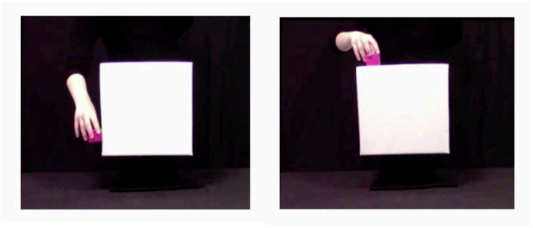

We use a method called the Intermodal Preferential Looking Paradigm (IPLP) to measure infants' categorization of support events. Infants are first shown several instances of either a 'support via side' event (left image) or a 'support from below' event (right image), which prepares them to think about their category of support. Next, they are shown a split screen where two new events of each support configuration are played simultaneously side-by-side. The amount of time they spend looking at each event is recorded. If infants do not have a broad category of support, we expect them to look longer at the 'support via side' event. Longer looking indicates that an infant is surprised by the novel spatial configuration they do not consider to be part of their current category of support.

Our results show that 6- and 12-month-old infants do look longer at the 'support via side' event compared to chance. This finding suggests that infants' category of support may be restricted to 'support from below' in the earliest stages of development.

Our eye-tracking device has been recording infants' looking times even more precisely! We have also added a 20-month-old age group to explore how older infants represent support once they have acquired language. The results of this study were recently presented at the Society for Research in Child Development (SRCD) conference in Austin, TX and they will also be presented on July 1st at the International Congress of Infant Studies meeting in Philadelphia.

Inspired by our findings, we are currently extending this research on support configurations to a new study with older children. We will be studying how 2- and 4-year-olds may understand other verbs used to describe the support configurations we have explored before, such as adhesion. In further refining our methodology, we will be using the IPLP method while also looking at how children may point to what they understand.

FUNDING AND PUBLICATIONS

Much of the research reported in this newsletter was funded by the National Science Foundation, grant #1650861. We have presented our research at several professional conferences and published our results in peer-reviewed journals. These presentations would not be possible without your participation! Thank you!!!!

Bindra, A., Ardis, J., Indarjit, M., & Lakusta, L. (2016). *Language Development of Goal Spatial Prepositions*. Poster presented at the Annual Student Research Symposium, May, Montclair, NJ.

Bindra, A., Garcia, O., Ponton, D., & Lakusta, L. (2015) Infants' comprehension of spatial prepositions. Poster presented at the Montclair State University Student Research Symposium, April, Montclair, NJ.

Brucato, M., Bindra, A., Polen, M., Lakusta, L., & Landau, B. (2016). The language of support in young children's spontaneous speech. Poster presented at the Eastern Psychological Association, March, New York.

Conlon, K., Apito, F., Ardis, J., Labropoulous, D., Bury, J., & Lakusta, L. (2015). Infants' comprehension of source and goal path terms in motion events. Poster presented at the Montclair State University Student Research Symposium, April, Montclair, NJ.

DiFabrizio, S., Lakusta, L., Sommer, M., & Colucio, I. (2015). Modulating a goal bias in infants' motion event representations. Poster presented at the Society for Research in Child Development, March, Philadelphia.

Farese. S., Lawrie, M., Lakusta, L. (2018). 18 month old categorization of goal events in animate and inanimate figures. Presented at the Montclair State University Student Research Symposium, April, Montclair, NJ

Lakusta, L. (2016). Conceptual foundations of language: Goals and sources over development. Invited paper presented at CUNY Colloquium Series, March, New York.

Lakusta, L., & DiFabrizio, S. (2017). And, the winner is…a visual preference for endpoints over starting points in infants' motion event representations. *Infancy*, *22*(3), 323-343. doi:10.1111/infa.12153

Lakusta, L., & Wagner, L. (2016). Conceptualizing the event: The relationship between infants' representations and linguistic organization. In D. Barner, A. S. Baron, D. Barner, A. S. Baron (Eds.) , *Core knowledge and conceptual change* (pp. 245-259). New York, NY, US: Oxford University Press. doi:10.1093/acprof:oso/9780190467630.003.0014

Lakusta, L., & Carey, S. (2015). Twelve-month-old infants' encoding of goal and source paths in agentive and non-agentive motion events. *Language Learning and Development, 11*(2), 152-175. DOI: 10.1080/15475441.2014.896168

Lakusta, L., Brucato, M., Bindra, A., Polen, M., & Landau, B. (2016, May). *The Language of Support in Young Children's Spontaneous Speech*. Poster presented at the International Congress of Infant Studies, May, New Orleans, LA.

Lakusta, L., Muentener, .P, Petrillo, L., Mullanaphy, N., Muniz, L., Sommers, M., Colucio, I. (2015). The influence of causation on a goal bias over development. Paper presented at the Society for Research in Child Development, March, Philadelphia.

Lakusta, L., Muentener, P., Petrillo, L., Mullanaphy, N., & Muniz, L. (2017). Does making something move matter? Representations of goals and sources in motion events with causal sources. *Cognitive Science*, *41*(3), 814-826. doi:10.1111/cogs.12376

Lakusta, L., Spinelli, D. Bindra, A., Ardis, J., Anthony, M., Conlon, K., Garcia, O., & Ponton, D. (2015). Infants' representations of goals in motion events: The relationship between event conceptualization and language development. Poster presented at the Cognitive Development Society, October, Columbus.

Lakusta, L., Spinelli, D., & Farese, S. (2016). The mapping of preverbal thought to language: Infants' categorization of goal paths in motion events. Presented at the 20th International Conference on Infant Studies, May, New Orleans, LA.

Lakusta, L., Spinelli, D., Anthony, M., Quinn., A., & Wiseman, K. (2015) *Infant's Categorization of Goal and Source Events*. Poster session presented at the Annual Student Research Symposium, April, Montclair, NJ.

Lakusta, L., Spinelli, D., Bindra, A., Ardis, J., Anthony M., Conlon, K., Garcia. O., & Ponton, D. (2015, October). *Infants' Representations of Goals in Motion Events: The Relationship between Event Conceptualization and Language Development*. Poster presented at the Cognitive Development Society, Columbus, OH.

Lakusta, L., Yuschak, K., & Batinjane, J. (under review). Infants' categorization of goal paths and source paths in motion events.

Lawrie, M., Goncalves, B., Keenan, J. P., & Lakusta, L., (2018). Measuring Early Emergence of Self-Awareness in Infants Using Eye-tracking. Presented at the Montclair State University Student Research Symposium, April, Montclair, NJ.

Pepe, B., Yasmin, H., Wefferling, J., & Lakusta, L., (2018). Comprehension of Spatial Prepositions in 18 and 24-Month-Old Infants. Presented at the Montclair State University

Student Research Symposium, April, Montclair, NJ.

Spinelli. D., Farese, S., & Lakusta, L. (2016). *Infants' Categorization of Goal Events*. Paper presented at the Annual Student Research Symposium, May, Montclair, NJ.

To view these and other posters presented at various conferences, please refer to our webpage at:
msudevlab.com

Thanks again for your participation!
We hope to see you and your little one again in the future!