

DUKE CHILD STUDIES NEWSLETTER

*Thank
you!*

What a year! Last January, we were happily running studies in our labs without a care in the world. By March, we'd shut down all in-person operations. Spring found us thinking hard about brand new ways of collecting data from infants and children through computer screens. Despite the challenges, our teams made progress on countless research projects this year. None

of it would have been possible, though, without the help of community volunteers. Thank you for taking the time to answer our calls and emails; for setting your kids up in front of a computer and encouraging them. And thank you to your children for being enthusiastic participants! We eagerly await the day when we can see you again at Duke, but until then, we'll catch you on Zoom!

CHILD STUDIES LABS

Duke Identity and Diversity Lab

PI Sarah Gaither, PhD

Bergelson Lab

PI Erika Bergelson, PhD

Tomasello Lab

PI Mike Tomasello, PhD

Empathy Development Lab

PI Rita Svetlova, PhD

Wilbourn Infant Lab at Duke (WILD)

PI Makeba Wilbourn, PhD

Duke Early Experiences and the Developing Brain Lab

PI Michael Gaffrey, PhD

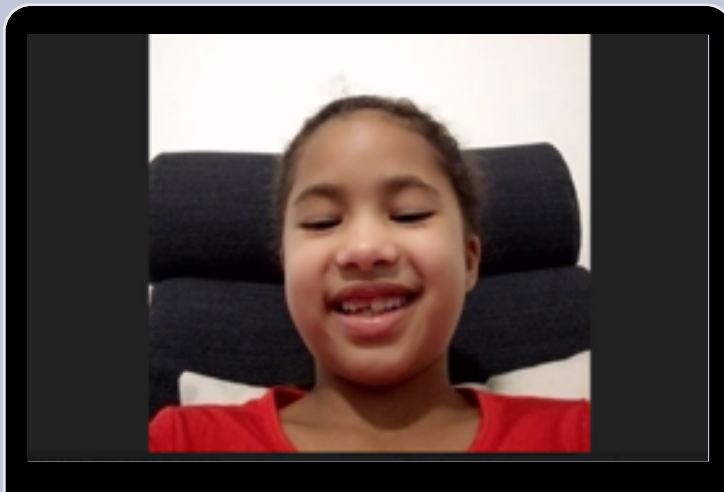
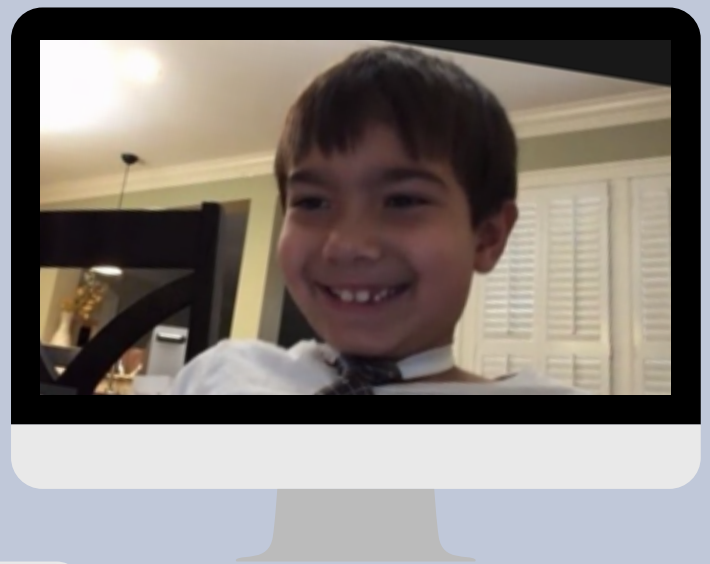


Duke Identity and Diversity Lab

This lab's recent research adventure has been understanding how children, particularly those in the age range of 3 to 5 years, learn to navigate through social groups. In the **Group Kid Perception study**, the goal is to investigate if “mutual intentions” (i.e., a person wants to join a group and the group also wants the person to join) are recognized and utilized as early on as the age of three. This study examines whether children use mutual intentions to recognize different social groups. Specifically, children were asked if an individual/character could join an existing group based on group type (friends or family) and intentionality (if the group does or does not welcome the individual plus the individual does or does not want to join the group).

Results have shown that four- and five-year-olds are more likely to join a group when the intention was shared by the group. **This suggests that children are aware of their sense of belonging to a social group depending on each other's intentions (welcoming or not welcoming) at a very young age.** Interestingly, children are more likely to decline allowing an individual to join a “family” group versus other groups (e.g., friends), even when mutual intentions are present.

Here are some snapshots of our awesome virtual study volunteers! Hooray for science!



Bergelson Lab

When is a new word no longer the same?

By Federica Bulgarelli

Last year, we ran a study to understand what 7- and 8-month-old babies know about how new words can sound. If you participated in this study, your baby sat on your lap in a soundproof booth (or at a computer in your own home as we adjusted to COVID-19), and heard a label for a picture on the screen. For example, they might have seen a red object called a 'neem' or a purple object called a 'lof'. Some infants heard a repeated instance of the word (we recorded it one time and repeated it over and over again), while other infants heard many different variations of the word from the same talker or heard the word from 10 different talkers.

We played these words for them until they got bored, which is how they can tell us they learned the word and do not want to hear it anymore! Then we asked what kind of change to the word infants noticed. For example, if they always heard the word from a female speaker (or 10) at

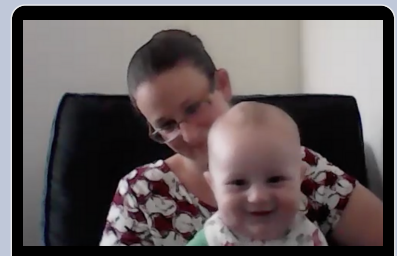
the beginning, and suddenly heard it by a male speaker, they might turn back to the screen to check out what's going on! If infants notice the change to a male speaker, this tells us that at this age infants think that male speakers sound different enough that they may be saying different words. If infants do not notice the change to a male speaker, we interpret this to mean that infants have learned that even though male and female speakers sound different, words they say still mean the same things.

Infants who heard a single instance of the word noticed the change to the male speaker. In contrast, infants who heard variations (by one talker or by multiple talkers) did not notice the change to the male speaker. **This means that how a word sounds during learning changes what infants think about how it can sound--this is pretty cool!** We are now running more versions of this study, asking about what infants know about the sounds that make up words that they've just



learned (is "noom" the same as "neem" for young babies?), and whether bilingual infants have different expectations about how words can sound.

If you have a 7- or 8-month-old in your life, we would love for them to participate. Due to COVID-19, we are running this study online, allowing us to recruit participants all over the country! You can email us for more information at bergelsonlab@duke.edu.



blab

Bergelson Lab

Toddlers don't learn verbs at the same time they learn nouns

By Charlotte Moore

We know from earlier studies that by the time babies are a year old, they are great at knowing the sounds in familiar words--in particular, regular nouns (ones that are pluralized simply by adding -s or -es). Babies show us this by looking less at an object when they hear its name mispronounced than when they hear it correctly pronounced. This mispronunciation effect is useful because it lets us know that babies learn the exact sounds in words, not just a general outline.

Last year, your participation helped us expand the types of words we know about to include irregular nouns like foot/feet. These words were interesting to us because the sounds in irregular words change, meaning babies have to learn that both sound combinations mean the same thing. In a separate study, we also tested both regular verbs (jump~jumped) and irregulars (run~ran). Verbs

need to be studied too because not only are there lots of irregular verbs, but verbs in general take longer for toddlers to learn.

We wanted to know if babies were as sure about the sounds in irregular nouns and verbs as they are about the sounds in regular nouns. In our study, we tested whether 16- to 28-month-olds recognized mispronunciations of these more challenging word types. If you participated in this study, your child sat in your lap while we tracked their eyes and either two pictures or two videos showed on screen. Your child was then prompted to look at one of the objects or actions they saw (e.g. "Look at the pig!" or "She's gonna throw it"). Half the time, the word they heard was mispronounced (e.g. "pog" for pig or "thraw" for throw). If your toddlers looked less to the correct side of the screen when the label was mispronounced, we could conclude that they noticed the word didn't sound right. **For nouns, we found that toddlers recognized irregular nouns just like**

how they recognize regular ones! The multiple different vowel sounds in words like "mouse/mice" didn't stop them from knowing the right sounds in those nouns. For verbs, we found a very different pattern. **Toddlers only started noticing mispronunciations for verbs after they turned 2.** Toddlers also had an easier time recognizing regular verbs than irregular ones. This lets us know that toddlers don't learn all words the same way, and that sound learning is related to more complicated things like grammar learning.



Bergelson Lab

How do adults understand what children say?

By Stephan Meylan

A lot of the time, children say things in ways that sound very different than the way adults say them.

Nonetheless, adults—especially parents—do a remarkably effective job of figuring out what children mean to say. While there is extensive research on the special ways in which adults speak to children ("child-directed speech" or "parent-ese"), no one has really looked before at these special listening abilities of adults.

From other research, we know that adult speech recognition critically depends on a predictive model of what people are likely to say. In one project in the Bergelson Lab we are working to characterize how often adults are using their expectations about what children are going to say to interpret what children actually say, whether existing computational models can capture this, and how this predictive model might support children's learning.

For the first question, we look at transcribed examples of child and adult language that have both the transcriber's best guess of what a child said as well as a precise transcription of how the kid actually said it. We find that these two things diverge quite a lot! **We find that adults' best guesses about what children said are different from what's actually said as much as 50% of the time at 18 months, but even at 4, adults are still "going beyond" what children actually say 5-10% of the time.**

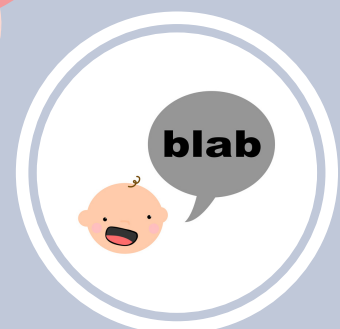
For the second question, we looked at how we can characterize the recoveries made by adults with state-of-the-art predictive language models. To do this we used a model called GPT-2 (you may have heard about it in the news), which can give us an estimate of how probable a sentence is in English. **What we find is that the best guess interpretations by adults are indeed much more probable under this language model than the literal interpretations.**

The third goal of this research is to investigate how this special ability might help children learn language. This early help from parents could impose structure on the language learning process, so that children nail down some of the most basic parts of language that are most vital for communication early, and then refine their understanding later.

Meylan, S.C., Bergelson, E., and Levy, R.P. (2020). Characterizing Child-Directed Listening with Corpus and Model-based Analyses. 22nd Biennial International Conference of Infant Studies.

If you're interested in reading more:

https://stephanmeylan.com/resources/smeylan_characterizing_cdl_icis2020.pdf



Bergelson Lab

Which words go together?

By Shannon Dailey

In this study, we investigated infants' early understanding of the relationships between words. Do 11- and 12-month-old babies know how words are related to each other?

If you participated in this study, your baby listened to pairs of words that were either related in meaning (like "mouth, nose") or not related in meaning (like "mouth, stroller"). On each trial, babies listened to a pair of words repeated over and over for as long as they wanted—once they got bored and looked away from the screen, the word pair would stop playing and we would move on to the next word pair.

Then, we compared how long babies listened to related word pairs, compared to not-related word pairs. **While we are still analyzing our results, it seems like babies listened equally long to the two types of word pairs on average.** If 11- and 12-month-old babies do not differentiate between the

two types of word pairs, this means they may not yet understand how words are connected to each other in meaning.

You may have participated in this study in our lab on Duke's campus (before March 2020) or over Zoom (October-December 2020). Thank you for taking the time to help us learn more about babies' early language learning!



Tomasello Lab

Sharing experiences with children creates social closeness

By Wouter Wolf

When humans want to form new social relationships or reinforce existing ones, we engage in a variety of social activities to make that happen, such as having conversations, playing games or team sports, making music and dancing together, or even just watching a movie together at home. Although this seems straightforward, such activities are quite extraordinary because we do not seem to be able to find similar social bonding activities in other animals.

We therefore wanted to know more about the psychology that enables humans to create social closeness through these social activities. One important thing all of these activities have in common is that participants share mental states. We share goals when playing team sports, emotions when making or listening to music together, and, at the most basic level, attention to the film we are watching together. Furthermore, we already know that humans

are particularly good at sharing mental states. It allows us to communicate (through language) and cooperate more flexibly than any other species. We therefore suspected that sharing mental states might also help us create social closeness with others in unique ways.

We therefore explored whether sharing mental states in its most basic form, through sharing attention to something, already creates social closeness between strangers. Specifically, we wanted to see if young children already use this psychology to connect to others. In our experiment, we found that 2.5-year-old children were more willing to interact with a novel adult who offered them a toy when this adult had just been watching a video with them than when the adult had been sitting next to them unable to see the video and reading their own book instead. (Continued on page 8)

If you're interested in reading
more:

<https://www.sciencedirect-com.proxy.lib.duke.edu/science/article/pii/S0022096519303078>



Tomasello Lab

(Continued from page 7)

Yet a similar study with great apes (bonobos and chimpanzees) found similar results, meaning there might be more to the way humans share mental states than just understanding if someone is experiencing the same mental state you are. In particular, we often check whether our partners are also aware of our experience being shared, sometimes through language, but often just through eye contact. This awareness, also known as common ground, might therefore also play an important role in creating social closeness.

We therefore conducted a follow-up experiment with children and great apes in which participants were watching a video with a novel adult, but this time the novel adult either made eye contact in response to the video starting (attempting to create common ground about them watching the video together) or made eye contact with them when they entered the room (simply observing someone entering the room).

Crucially, we found that children, but not great apes were more willing to interact with their novel partner when their partner attempted to create common ground about their experience being shared. These findings highlight a nuanced, but potentially very important difference between how humans and great apes (and perhaps other animals) experience shared mental states, and might therefore help explain why humans, but not other animals, engaged in such extraordinary shared social activities.

If you're interested in reading more:

<https://www-sciencedirect-com.proxy.lib.duke.edu/science/article/pii/S0022096520300783?via%3Dihub>



Tomasello Lab

Investigation of the effects of individualistic and collectivistic framing on children's commitment, sharing, and helping

By Jared Vasil

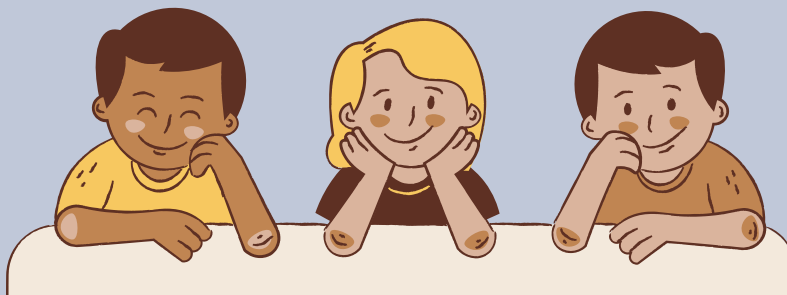
This study looked at how verbally framing social interaction by using either individualistic words (e.g., you and your) or collectivistic words (e.g., we and us) impacted three- and four-year-olds' moral and prosocial behavior. In this task, children were invited to decorate for a party alongside the experimenter. The decorating task was either described to children as something "we" do or something "you" do. We found that collectivistic 'we'-framing was associated with increased sense of commitment compared to individualistic 'you'-framing. Three-year-olds demonstrated this by being more likely to offer a reason for leaving their interaction partner after 'we'-framing, while four-year-olds were less likely to leave their partner in the first place after 'we'-framing.

Framing did not change children's tendency to distribute stickers fairly with their interaction partner or to help their interaction partner to get to something that was out of reach.

We thank all the children and families who participated in this study! If you have further questions about the study, please contact jared.vasil@duke.edu.



In this picture, a participant is deciding how to distribute a set of "decorations" (colorful erasers) amongst themselves and their partner, Eeyore.



DEED Lab

PARTICIPATE IN RESEARCH FROM YOUR HOME

We are actively recruiting children between the ages of 8 to 12 years to participate in our reward processing and the developing brain research!

Study Purpose: The purpose of this research study is to learn more about how the brain supports emotional development in children 8 to 12 years of age. Help us learn more about how children's brains work!

Participation: For the parent, participation involves a phone screen to determine eligibility to participate and the completion of several questionnaires, which can take up to 30 minutes. Your child will be asked to complete a computer game from your home, which takes up to 45 minutes including breaks.

Compensation: You will earn up to \$20 in Amazon e-Gift Cards for your participation.

Contact: If you are interested in participating or would like to learn more about ongoing research, please contact the DEED Lab by calling 919-613-0200 or emailing at deed@duke.edu



DEED Lab

ATTENTION PARENTS OF
KIDS 4 - 7 YEARS OLD:

Participate in research at Duke's DEED Lab!

Dr. Michael Gaffrey is conducting a study to learn how developing brain function may help identify factors related to later social and emotional difficulties.

First visit: 4 - 5 hours

Second visit: 1 - 1.5 hours

Third visit: 1 - 1.5 hours

**Earn up to \$200 cash & \$70 gift
cards for completing all visits**

FOR MORE
INFORMATION:
(919) 613-0200
deed@duke.edu
sites.duke.edu/deed/



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If you have friends with kids who might be interested in participating in our studies, send them **here** to sign up!

If you are interested in online research opportunities with labs around the world, check out **childrenhelpingscience.com** (some of our studies are even featured there!).

