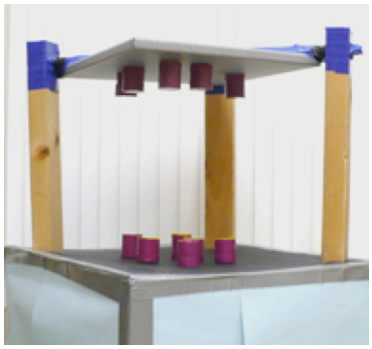
"Blickets" Interpretation Guide

EXPLORING EVIDENCE (ASSUMED vs. OBSERVED PROPERTIES) & OBJECT CLASSIFICATION



Background: Researchers from MIT's Early Childhood Cognition Laboratory conducted a research study looking at how children use an object's name to make inferences about its properties. The following activity is based on the first of four experiments that were performed as part of that study. In this experiment, researchers introduced toys called 'blickets' to children ages 3 and 4. These toys were revealed to children as magnetic when they were stuck to a metal board (see picture on the left). Children were later introduced to a new set of physically indistinguishable toys that lacked magnets.

Researchers Found:

1. When children were told that the second set of toys were also called 'blickets,' they would assume this set was also magnetic and would try sticking all (or almost all) of the new 'blickets' to the metal board before realizing that the new 'blickets' would not stick.
2. However, when children were told the new blocks were called 'dax,' they tried fewer of the toys before realizing that the new toys would not stick. This showed researchers that, unlike with the new 'blickets,' children quickly assumed 'dax' were a new set of toys.

It is also important to note that because of the grammatical ambiguity of the word 'dax' - when spoken, it is difficult to tell whether the word is singular ('dax') or plural ('dacks') - the researchers used the word 'feps' in all subsequent experiments. Therefore, we use the word 'feps' instead of 'dax' throughout this guide.

Why is this important?

As educators, we believe that children learn through play, but until recently there was little empirical evidence for how play facilitates learning. This study illustrates two findings which support the idea that children learn about the world around them through exploratory play: 1) children will spend more time engaged in exploratory play with an object whose observed characteristics contradict their assumed characteristics (children play longer when a object doesn't do what they expect); and 2) even young children are sensitive to the connection between the name of an object and its characteristics (children hold more strongly to the belief that two objects are the same when they look the same and have the same name than when they look the same but have different names). Just as an adult who is handed a can that says Diet Cola on it, and whose contents look like Diet Cola, will expect the contents of that can to taste like Diet Cola, young children expect a second set of toys that are called 'blickets' and look like 'blickets' to stick like 'blickets'. Just as an adult who is handed a can that says Diet Cola, but is told it contains Cherry Cola, will not expect the drink in that can to taste like Diet Cola (even though it looks the same as Diet Cola), young children are less likely to expect a second set of toys that look like 'blickets' but are called 'feps' to stick. These ideas connect directly to museum interpretation: as educators, we look for ways to determine children's current understandings and engage them in activities to overcome misconceptions - knowing that young children assume properties, based on what something is called, can inform the way we talk with children about museum objects (e.g. related to classification: What is a "fossil"? Are all bones fossils? Are all rocks fossils? Did all fossils used to be bones? Are all fossils rocks?).

Method:

Recruiting Methods:

1. Introduce yourself to parents, explaining to them that you are demonstrating a study originally completed by MIT that looks at how children use names to make assumptions about an object's properties. Ask if their child would like to play.
2. Ask children if they would like to play a game with you. One way to really grab children's attention is to show them how the 'blickets' stick, or even to just carry a 'blicket' around with you and ask children if they want to play a game with this really cool toy you are holding.

Activity Instructions (the "study method"):

Please reference Experiment 1 of the original study (Schulz, Standing & Bonawitz, 2008)

In this activity we use the condition where both sets of toys are called 'blickets':

1. Introduce the 'blickets' and demonstrate how they work by making the 'blickets' stick to the metal board [*"These are 'blickets.' Watch this!"*].
2. Remove the 'blickets' from the magnetic board and then say to the child: "Now you try." Allow the child to play with the 'blickets' for a short period of time. This is done to make sure the child understands that one of the properties of these toys is that they can stick to the board.
3. Take away the 'blickets' and introduce the second set of toys, calling them 'blickets' as well ["*And here are some blickets! Go ahead and play with these*."]. Observe how many of the new toys the child attempts to stick to the board.
4. While the child continues to play, explain to parents that with some children the researchers ran a second condition where they introduced the first set as 'blickets,' but then introduced the second set as 'feps.' Tell parents about what the researchers found and why their conclusions add important information to our understanding of how children learn.

Activity Tips (e.g. what to observe as the child plays, discussions to have with parents)

Help parents observe:

- Do children think that there is a connection between a toy's name and its characteristics?
- How long does it take children to deduce that the second set of toys are not the same, even though they are also called 'blickets'? How long does it take children when the second set of toys is instead called 'feps'?

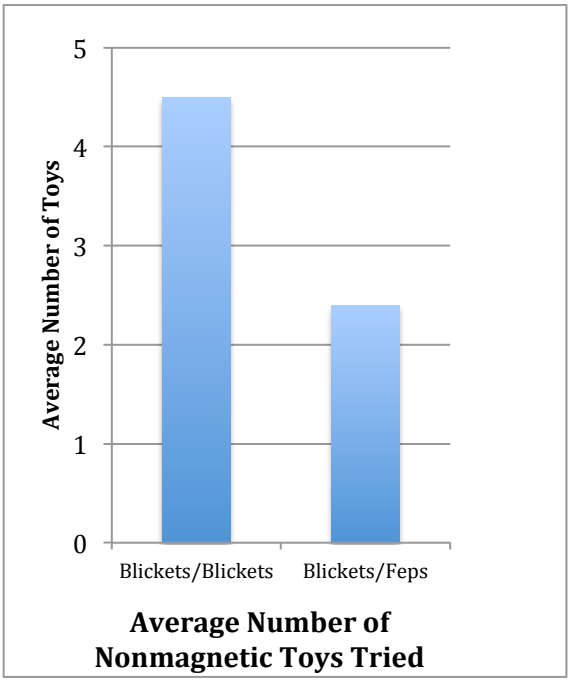
Keeping Kids Interested: For older children, or children who have already played the above game and want to try something else, introduce the first set of toys as 'blickets', them mix them with the second set of toys, and challenge kids to "find all the blickets" or "find all the feps." See if children can figure out what you mean when you ask them to find "feps" even though they have never heard the word before Other ways to keep older children interested are to ask them if they have any ideas about why they thought the new 'blickets' or 'feps' would (or would not) be the same as the first set of blickets, or to use this activity as a way to introduce children to what kind of scientists psychologists are, and what kind of work they do.

Keeping Parents Interested: This study is much more interesting for parents when the second set of toys is called 'blickets'. In this condition, parents are able to see their child spend some time

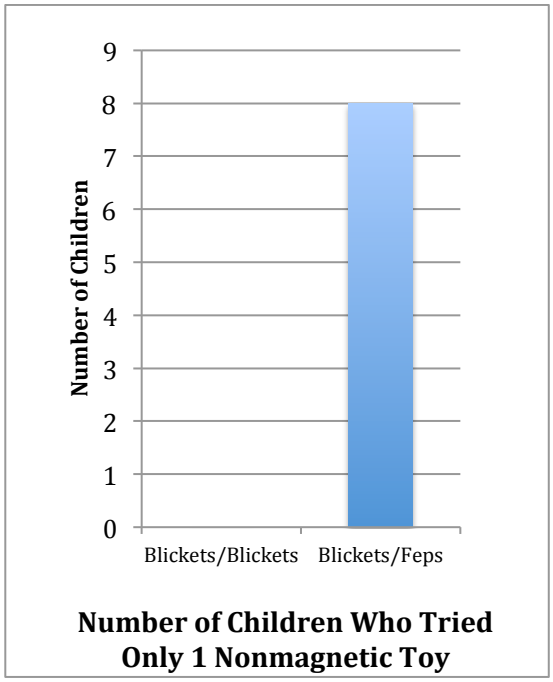
trying to get the new 'blickets' to stick to the board. Once the child loses interest in the new 'blickets,' it can also help to give them back the original 'blickets' to play with while you discuss the study and its results with parents.

Results of the Original Study

This study found that when the second set of toys was referred to as 'blickets,' children most often tried 4 or 5 of the 5 toys. When the second set of toys was referred to as 'feps,' children most often tried 2 or 3 of the 5 toys. This is shown in the left-hand graph, which represents the average number of the second set of toys tried for each condition. The right-hand graph represents the number of children who tried only one magnetic toy. When the second set of toys were referred to as 'blickets,' none of the 16 children assigned to this condition tried only one nonmagnetic toy. When the second set of toys were referred to as 'feps,' eight of the 16 children assigned to this condition tried only one nonmagnetic toy. This shows that while half of the children who were told the two sets of toys had different names believed the second set were nonmagnetic after trying only one toy, none of the children who were told the two sets of toys had the same stopped trying after testing only one nonmagnetic toy.



Average Number of Nonmagnetic Toys Tried



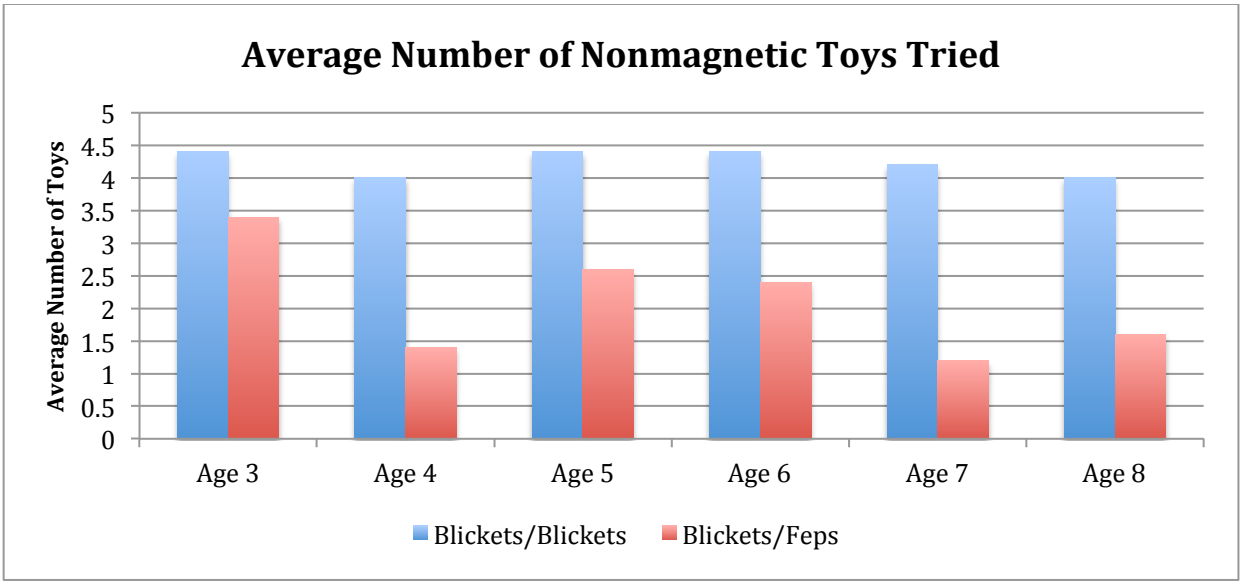
Number of Children Who Tried Only 1 Nonmagnetic Toy

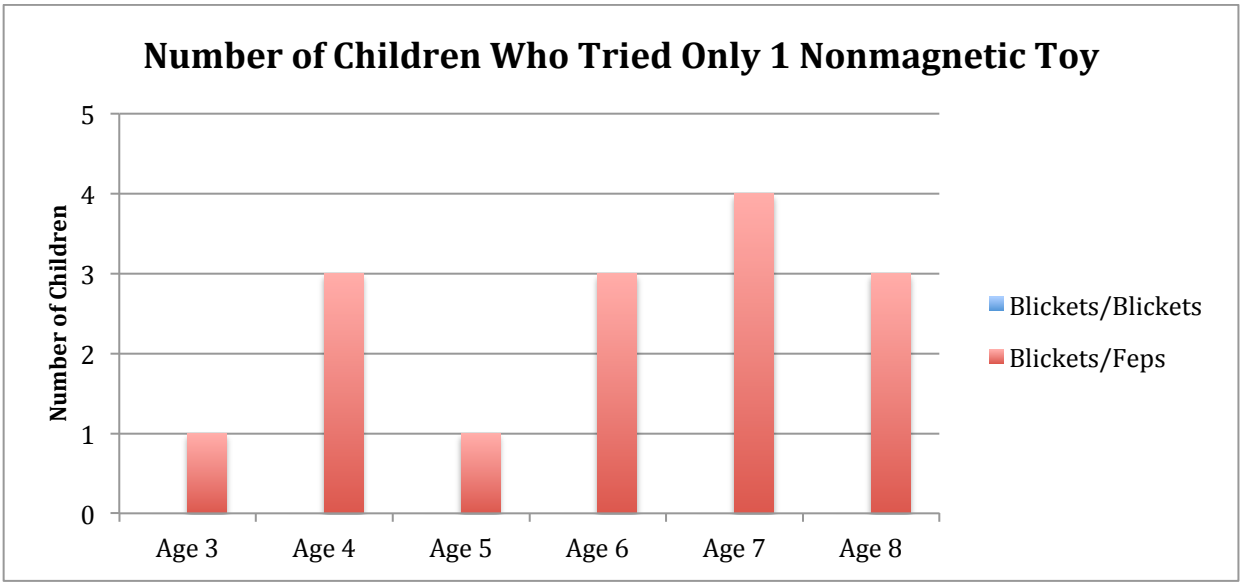
Prototyping the Activity in the DC:

While the original study looked at children ages 3-4, we invite children of *all ages* to participate in the 'Blickets' museum activity. In presenting this study as a museum activity that children of any age can participate in, our goal is to interest parents/other caregivers (and older children, in some cases) in research studies, and convey the significance of cognitive science in their daily lives. Through demonstrating and discussing the study, we are able to introduce concepts such as exploratory play and developmental learning to every visiting caregiver. As we developed the activity for use with a wide age range, we were interested in how older children might behave as "participants" in the study (younger children also enjoy playing with blickets, but they have trouble understanding the directions of the study and were therefore not included in our

additional prototyping). While this prototyping was not a controlled experiment, it did provide insight on how children of other ages might respond in the study situation.

We observed 60 Discovery Center visitors between the ages of 3 and 8, with 5 children of each age per condition (10 children total per age). Our findings were similar to those of the original researchers - we found that children often tried all (or almost all) of the toys when both sets were referred to as 'blickets,' but tried fewer toys when the first set were called 'blickets' and the second set 'feps' (see top graph, below). As in the original study, none of the children in the condition where both sets were referred to as 'blickets' tried only one toy, while half of the children in the condition where the two sets of toys were called different names stopped trying to attach the toys to the board after trying just one toy.





Questions Parents May Ask:

1. *What age does my child have to be in order to participate?*
   The original study looked at children between ages 3 and 4. However, since this is just a demonstration of the research study, children of any age are welcome to participate.

2. *Is my child smart for his/her age?*
   There are no right or wrong interpretations in this study, and children's responses in no way indicate intellectual capacity. The results of the study only indicate a trend in children's behavior when presented with two different situations (e.g. varying object names); however, every child has a unique way of looking at and classifying objects.

3. *Should I help my child understand the difference between the blocks?*
   Since the concept is more simple and clear to adults, we believe it's more educational to first have the child to try to understand the difference without help from an adult. Then, through talking with the child/asking him or her questions (e.g. Do you think that the two sets of toys are the same? Why did you think the two sets of toys were the same at first?), we can help children realize why the two sets of toys are different and why it took them some time to come to that conclusion.

4. *Why is this important?*
   This study shows that even children as young as 3 and 4 are making connections between an object's name and its properties and then testing and revising those connections through exploratory play.

5. *Where can I learn more about this?*
   Give parents the insert for this study. Both the insert and this interpretation guide have some ideas on how children can explore similar concepts at home and in a museum environment. Direct parents to the Living Lab website: www.mos.org/discoverycenter/livinglab, where they can look for more details about the researcher and the current status of her research.

Activities for Parents to Try at the Museum

- *Natural History Area:* Children often think the mystery bones belong to a dinosaur because they associate loose bones with dinosaurs. Talk to your child about how these bones are not, in fact, from a dinosaur, rather from an animal that we still have around today. Do all animals have bones? Show your child the human skeleton and the animal skulls.
- *Physical Science Area:* The magnet box contains both a magnetic ball and a non-magnetic Ping-Pong ball. If you show your child that one ball is magnetic, does s/he assume that the second ball is magnetic as well? How long does s/he try to get the non-magnetic ball to stick to the magnet?
- *Geology Field Station:* Has your child ever smelled a rock? Find five yellow-green rocks in the Field Station and try to figure out which one is the rock with a funny smell. Does your child explore the rocks more, or try to smell other rocks, after finding one with a unique scent (sulfur)?

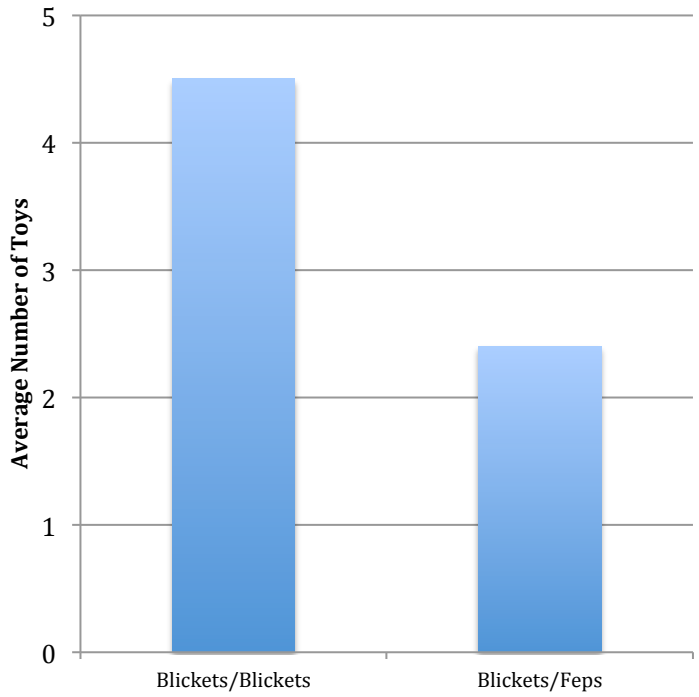
Activities for Parents to Try At Home:

- Show your child how a magnet can stick to a metal spoon. Then let your child play with

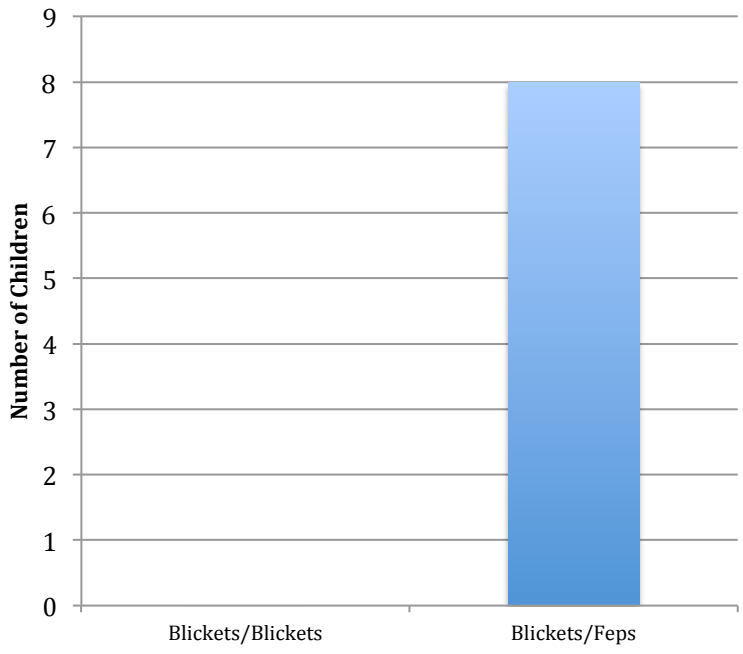
several metal spoons and a magnet to observe the magnetic attraction for him/herself. Next, present your child with several plastic or wooden spoons, and let him/her discover through play that the second group of spoons is not attracted to the magnet. What name does your child call the second group of spoons? Does your child call them 'spoons' even if they are not magnetic? What makes a spoon a 'spoon'?

Sources & Resources

Schulz, L.E., Standing, H.R., & Bonawitz, E.B. (2008). Word, thought and deed: The role of object categories in children's inductive inferences and exploratory play. *Developmental Psychology, 44*, 1266-1276. doi: 10.1037/0012-1649.44.5.1266



Average Number of Nonmagnetic Toys Tried



Number of Children Who Tried Only 1 Nonmagnetic Toy