Children and Secret-Telling: How they spill the beans

Chloe Johnson

Thompson Rivers University

Undergraduate Research Experience Award Program

Abstract

Knowing who children share secrets with can aid in the understanding of what factors influence the transmission of secrets by children. The present study examines who and how children tell when they have seen a transgression committed by an adult. Specifically, do children tell a peer or an unfamiliar interviewer? Children aged 2-12 years attended a science event with half the group seeing a show that included an adult transgression and the other half viewing a show with no transgression event. Child then discussed the science shows with a peer and then with an unfamiliar adult. Of the seventy-eight participants, only three disclosed that there was a transgression to any recipient. Understanding this low level of disclosure is crucial for cases where a child has experienced a harmful event and is not disclosing information that could help them.

Secret-telling and Children: How they spill the beans

Secrets

Understanding how children share secrets between each other is important. Secrets foster loyalty and belonging within a group (Misch, Over, & Carpenter, 2016) and are a common way for children to develop social networks. Secrets are often well-kept when telling may have consequences for acceptance within a group. In one study, children aged five years old were put into a group of green or yellow denoted by their scarf colour (Misch et al., 2016). They were shown the secret book of their group and then a stranger who was not wearing a scarf came in and asked where the secret thing was. Even when young children were bribed with stickers to tell the group secret they did not tell the outgroup member (Misch et al., 2016). This demonstration of loyalty to their group is seen even among very young children.

Peers are the most likely recipients of secret-sharing, and this can be important if the secret is about something bad that has happened to a child (e.g., abuse or neglect). Peers can be a highly persuasive source of information. Research by Principe, Cherson, Depuppo, and Schindewolf (2012) addressed rumour spreading in children aged 3-6 years old. They found that rumours spread by adults did not foster as deep and extensive rumour mongering as rumours spread by the children's peers. In this study, they showed children a magic show where the magician was supposed to pull a rabbit out of his hat but failed to. Later, the children either overheard that the rabbit was loose in the school or were classmates of other children who had overheard. Children's memory of the rumour was tested one week and then four weeks after the event and the responses of what had happened were mostly incorrect, the rumoured occurrence was reported instead of the actual occurrence. This demonstrates that rumours can be more damaging when gleaned from peers than when overheard by adults.

How do children know that information is confidential? A study by Anagnostaki, Wright, and Papathanasiou (2013) asked 5-6 year olds who they predicted a puppet would disclose information to after being given verbal cues that made it seem like the information contained a secret or no such verbal cues on the nature of the information. They found that children would only share secrets with the puppet's friend instead of the other children (non-friend). They did not discriminate between friends and non-friends when sharing non-secret information. This may be an indication of children's emotional maturity and the development of relational closeness (Anagnostaki et al., 2013). This differs from research by Price et al. (2017) that found that in some cases children are more likely to share information with an adult. Depending on the secret and the level of confidentiality, children may find it more appropriate to tell an adult rather than their friend or vice versa.

Do children really understand what a lie and a secret are? Do they understand that lying has the potential to be damaging? Lavoie, Nagar, and Talwar (2017) interviewed children aged 8-15 about the definition of secrets and lies and discussions and judgements on who tells lies and their own secrets and lies. Younger children defined secrets and lies much differently than older children, lies being doing or saying something wrong and not telling your parents and secrets being something you tell a good friend and no one else, something mean and meant to be kept. Older children defined lies as the opposite of reality and secrets as information that is not meant to be shared. As children get older, why they tell lies and why they keep secrets changes, as well as their perceptions of these things (Lavoie et al., 2017). Where in this spectrum a child is at can influence who they share confidential information with, the way they share it, and why they share it.

Lying

Secret telling, and the decision to keep secrets, could be related to lying. Research by Popliger, Talwar, and Crossman (2011) explored prosocial lie-telling in second and fourth graders. Groups of children either lost a good gift in exchange for disappointing gift or just received a disappointing gift. They evaluated the children's reactions to the gifts (e.g., lying by saying they liked it) and discovered that there was no age difference in lying when children were not expecting a good gift, both young and older children lied the same amount. However, younger children were less likely to lie in the first condition, when they had lost a good gift for a more disappointing one. This tells us that younger children are more motivated to lie by self-oriented reasons or to avoid negative outcomes whereas older children may lie for other-oriented reasons, such as to be polite. Children also seemed to evaluate the feelings of the person they were lying to when deciding whether or not to lie. The prosocial behaviour of children in both

conditions could have the same underlying motivation as secret-keeping. Children might think about how the person who they are telling the secret about might feel.

Children tell lies depending on what they think that others know (Fu, Evans, Xu, & Lee, 2012). When presented with the opportunity to commit a transgression, if they have been seen and know or think that the interviewer knows they have committed the transgression then they will be more truthful. But if the child thinks that the interviewer does not know about the transgression then they are more likely to outright lie if asked if they committed the transgression. Children can strategize about what to tell others (truth or lie) when the recipient's knowledge is unknown (Fu et al., 2012). Even when it is clear that a child has committed a transgression, they will tell a strategic lie to relieve blame from themselves (Evans, Xu, & Lee, 2011). In a study conducted in China, children were asked not to peek under a cup, if they did then the contents of the cup would spill and there would be physical evidence that the child had peeked. The older a child was, the more likely they were to tell a strategic lie excusing themselves from blame for the incident. In this case, a strategic lie would be a false statement consistent with the physical evidence, such as "Other children came in and knocked over the cup but you did not see". Evans et al. (2011) also tested children for different factors that could influence lying behaviour such as theory of mind understanding and executive functioning. They found a link between executive functioning and lie-telling. Interestingly, there was no correlation between children's planning skills and lie telling, though the researchers impart that this may be because they did not give them enough time to plan a lie (Evans et al., 2011). Secret-keeping and secret-telling may be linked to executive functioning in much the same way that lie-telling is.

Transgressions by Others

Who children are talking to and how their conversation partners reacts to them may predict whether they disclose a secret. If children talk with an unsupportive parent, they tend to recant their disclosure of negative events while those with supportive parents stand by their disclosure (Malloy & Mugno, 2016). In a recent study, children witnessed an adult wrongdoing and were then interviewed by a researcher so that they did not forget the transgression event (Malloy & Mugno, 2016). They then talked to either a supportive or unsupportive mother about an adult breaking a puppet. After receiving support or no support from their mother, the children talked to another interviewer who asked the same questions as the first interviewer. If the child's mother was unsupportive and the child recanted the disclosure while with their mother, they continue to recant it in the second interview.

Similar to the present research, a study by Price, Evans, and Bruer (2017) explored how children disclose transgressions to peers and adults. Children who heard about a transgression from another child but did not witness it themselves were likely to transmit that information to an unfamiliar adult. Admissions by children who witnessed the event were more rare, which is understandable given that those children were asked by the person who committed the transgression not to tell anyone. Children who simply heard about the event are not held to the same social contract as the children who witnessed. Interestingly, children disclosed the transgression more often overall to adults than peers, perhaps because adults are seen as more trustworthy than their peers (Price et al., 2017).

Disclosures

The way that children are asked questions may also affect how or if they disclose to the questioner. Research by Evans and Lyon (2012) explored children's understanding of the questions asked of them in court. It was found that children do experience some

misunderstanding based on question-type, with the most errors in "Do you know" questions about truth and lies (Evans & Lyon, 2012). How a question is asked can greatly affect the answer, as shown by Malloy and Mugno's (2016) and Evans and Lyon's (2012) research. If an interviewer is harsh and contrary, it is unlikely that a child will feel like they can trust them. Likewise, if an interviewer or other surrounding adults are caring and supportive then it is possible that the child would be more likely to disclose information that they feel is confidential.

The present study will explore how younger children share secrets with one another and with adults. This is important for the understanding of how children interact and the role of that interaction on their social groups and psychosocial development. This study will also further the understanding of who children disclose negative information to. Children are asked to discuss science shows that they have watched to each other and then to an adult interviewer. The way that children explain negative events, if they even do, will be recorded when they discuss with peers as well as with adults.

Method

Participants and Design

Children (N = 78; *n* = 44 females) aged 2-12 years (*Mean age* = 5.33, *SD* = 1.95) were recruited from local child care facilities. There were 29 children between two and four years old, 32 between five and six years old, and 17 between seven and twelve years old. Parents signed a consent form and children gave verbal assent before the experiment began. Children were quasi-randomly assigned into a condition in a 2 (transgression, no transgression) group design.

Materials and Procedure

The children were randomly assigned to one of two groups, one group viewed an environmentally-themed science demonstration and the other group viewed an ocean-themed

science demonstration (see Appendix A for demonstration scripts). In one of the demonstrations (counterbalanced across participants), there was a transgression event. Both demonstrations were performed by an undergraduate researcher.

The Event

In each demonstration, children participated in three activities. In the environmentally themed science demonstration, children first learned how to make a rain cloud in a jar. They then were shown how to make a water filter in a pop bottle. The final demonstration was learning how to make a tornado in a jar. If the transgression was during this demonstration, the lid popped off of the jar and water accidentally spilt onto a cell phone that was sitting nearby that belonged to another confederate. The demonstrator picked up the phone and tried to make it work, when it would not the demonstrator asked the children not to tell anybody that she had made a mistake.

In the ocean themed demonstration, children first learned how to make the layers of the ocean in a jar. They then learned how fish breathe, using a cup and coffee filter. The final demonstration was learning about the different density of salt water versus fresh water. If the transgression event was during this demonstration, the demonstrator accidentally knocked over the cup of fresh water onto a cell phone that was sitting nearby that belonged to another confederate. The demonstrator picked up the phone and tried to make it work, when it would not the demonstrator asked the children not to tell anybody that she had made a mistake.

After the science demonstrations, each child from the transgression event group was paired with a child from the no transgression event group and the children were asked to describe the respective science shows to each other. Children were paired up quasi-randomly, with the restriction of an attempt to age and gender match pairs as closely as possible. Children were told that their conversation would be recorded and a recording device (turned on and off by a

researcher) was placed near them. After discussing with their peer, each child was interviewed individually by an adult researcher (an undergraduate student) and asked to describe what they learned at the science show.

Interviews

After viewing the science demonstrations, the children were given instructions to describe what they saw in the demonstrations to a peer who viewed the other demonstration. After the peer interviews, each child was interviewed by an adult, an undergraduate researcher. The researcher knew which demonstration the child witnessed but was blind to which demonstration had the transgression event. The interview started with the researcher asking open ended questions to the child starting with "A little while ago, you got to watch my friend do a science show for you. I wasn't here for the show so I don't know what happened, but I really want to learn all about it. Tell me everything you can about what happened when my friend showed you the science stuff." The child was prompted with general prompts ("What else can you tell me?") until their memory appeared to be exhausted. The interviewer then moved onto the cued recall portion of the interview (See Appendix B; e.g., "The first experiment was about clouds. What materials did she use to show you the cloud experiment?")

In both interviews, the cued recall portion was followed by open-ended questions about the event that they heard about from the other child that they had talked to. The interviewer said "After you saw the show, you talked with another kid who saw a different show. I wasn't there for that show either and I'm really interested in learning about the other show too. I know you didn't see it yourself, but please still tell me everything you can about what happened in the show you didn't see." The child was prompted about what they heard until they had nothing else to say. The children were then administered a relationship questionnaire (See Appendix C).

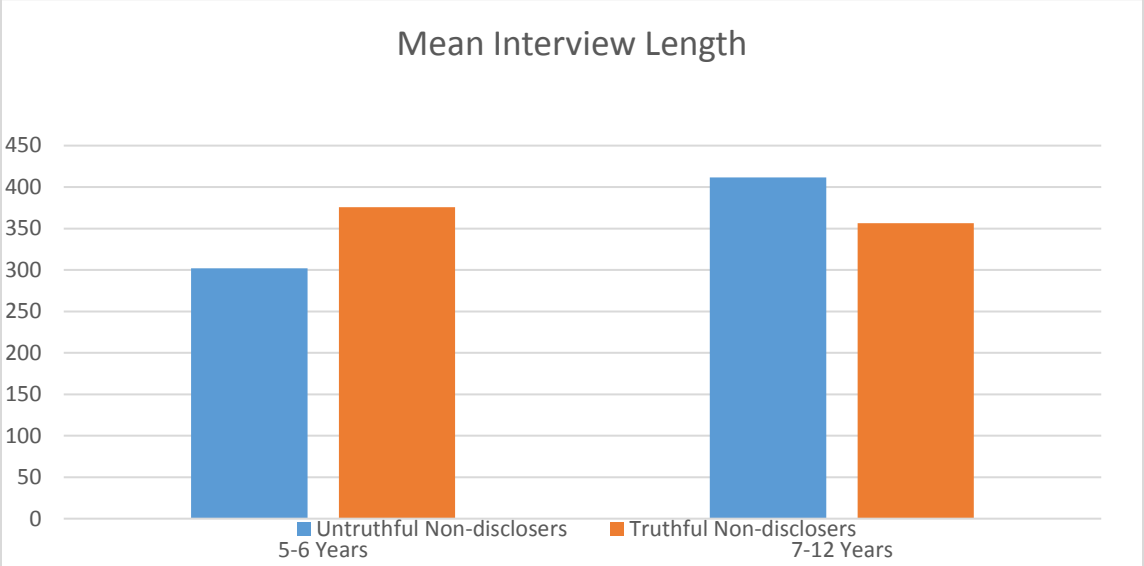
After the interviews, the interviewer thanked the child for his/her help and offered a gift for participating in the study. Once all children were interviewed, the researcher gathered all the children and thanked them for participating and said "I know that something happened to a phone, but it's still working so don't worry!"

Results

A primary original aim of this study was to measure the frequency of children's disclosures to peers and to adults. However, very few children disclosed the event Of the 78 children, only three disclosed (Two children disclosed to both peers and adults, one child disclosed to only an adult.) Because of this, different aspects of the data were examined.

We anticipated that the duration of the interview might differ as a function of whether or not children witnessed the transgression. The children were split into different age groups as research has shown that lying increases as cognitive skills increase, as it does with age (Evans & Kang, 21013). We ran an F-test that split kids into a 2 x 2 between subjects factorial design, with children divided by age and by condition (having seen the transgression or not). There was an interaction between age and disclosure, F (1,47)=3.318, p=.075, η^2_p = .07. The differences were examined and it was discovered that there was a difference in interview duration for older children, but not younger children. It was found that children aged 7-12 years old who witnessed the event, untruthful non-disclosers (M=411.45 *seconds*, SD=80.81), had longer interviews than children aged 7-12 years old who did not witness the event, truthful non-disclosers (M=356.50, SD=103.89). This was in contrast to children aged 5-6, where those who witnessed the event, untruthful non-disclosers (M=302.13, SD=128.57) had shorter interviews than those who did not witness the event (M=375.73, SD=119.36). These results were also not significant. Children

aged 2-4 years old were left out of the data set because their data was unreliable, most interviews could not stay on topic and there were a significant amount of outliers.



Discussion

The present study aimed to explore disclosure rates in children aged 2-12 years who witnessed a transgression event. Since there were so few disclosures, this could not be explored. Other aspects of the data were analyzed instead, with age relating to interview length being the main focus. With only three of seventy-eight children disclosing, children must have had some reasons for not disclosing. They may have established a relationship with the demonstrator and felt a loyalty to them, such as in the research by Misch et al. (2016) where children did not disclose to people that were not in their group, children could have felt that the demonstrators were in their ingroup and the interviewers were in an outgroup. Children may not have felt that the transgression was serious enough to disclose, perhaps if the transgression were on a more significant object, such as a laptop, as used in a study by Price at al. (2017), then the children may have felt more inclined to disclose.

Another possibility is that the nature of the transgression could have influenced whether children disclosed or not. Research by Over, Vaish, and Tomasello (2016) found that children felt significantly more guilt if a child in their ingroup committed a transgression (breaking a toy) than if a member of an outgroup did. Conversely, children may respond differently to uphold prosocial norms. Children in a study by Harvey, Davoodi, and Blake (2017) were approached by another child and asked if they knew where to find a third child, they were told that the seeker was looking for the child to either steal something from them or to give them cookies. When children were told that the seeker was going to steal, older children lied and told misdirected the seeker significantly more than when the seeker was going to give the child cookies. This is an example of children disclosing to other children, the results of the study may have been altered if there was an adult seeker.

Another study by Heyman, Loke, and Lee (2016) based on children policing adults actions employed a method of comparing children's reaction to a high stakes transgression (ripping a page out of a library book and colouring on it) committed by an adult to children's reaction to a low stakes transgression (ripping a page out of an off-limits notebook and colouring on it). The researchers found that having seen the high stakes transgression, older children reported the transgression to another adult both spontaneously and when prompted much more than when older children who saw the low stakes event (Heyman et al. 2016).

Children aged 7-12 years old that viewed the transgression event had a longer mean interview length than those that did not view the transgression event while children aged 5-6 years old who viewed the transgression event had a shorter mean interview than those that did not view the transgression. Older untruthful non-disclosers talked longer than older truthful non-disclosers, possibly rambling and talking around the transgression so that they did not disclose.

Younger untruthful non-disclosers had shorter interviews, it's possible that they wanted to get the interview over with or talked faster because they were nervous about disclosing.

Limitations and Future Directions

This study was limited by sample size, with only 17 children between the ages of 7 and 12 years old, the study had low power. The study was also limited in that every daycare visited was laid out differently with distractions abound. Children may have missed parts of the demonstration or have been able to hear the demonstration in the other room. It is also possible that children could hear their peers being interviewed by the adult interviewers.

It is recommended that future research obtains a measure of likability of the demonstrator that is performing the science show and match that with the likability of the interviewer so that the child does not feel a bias towards one or the other. It is also recommended that the transgression event includes a higher stakes transgression, perhaps committed against something of value to the children or the daycare or with the transgression being committed by a child.

Conclusion

Children aged 7-12 years who viewed a transgression committed by an adult spoke for a longer time in interviews than children who did not view the transgression. Children aged 5-6 years who viewed the transgression spoke for a shorter amount of time than those who did not view the transgression. Older children that were untruthful non-disclosers may have been talking and rambling on to avoid discussing the transgression. However, there were very few disclosures overall, which limited ability to analyze data relating to disclosure rates. This low rate of disclosure demonstrates there are conditions under which children are very likely to keep a secret – a finding that should be explored in future research.

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Appendix A: Science Show Demonstration Scripts

Science Show 1: Ocean Themed

Hello everyone! My name is _____ and today I will be teaching you about the ocean! I will show you a few experiments and then we'll have some discussions about what we learned.

For our first experiment we are going to make the layers or zones of the ocean in a jar. Each zone gets a different amount of light from the sun and the water in each zone is a different thickness. The bottom zone is where the water is the thickest and no sunlight reaches this zone because it is so deep. Only a little bit of sunlight reaches the middle zone and so that means that only a few animals can live in this zone. The upper zone is where the most sunlight reaches. This zone is where most of the plants and animals live, like fish, whales, and sea turtles.

Here is how you make the layers!

For this experiment we are using: A clear jar, food coloring, corn syrup, oil, dish soap, water, rubbing alcohol and funnels.

STEP 1: Add lots of blue and red and green food colouring to 3/4 cup of corn syrup and pour into the bottom of your glass jar.

STEP 2: Mix blue food coloring into 3/4 cup of dish soap. Our dish soap is already blue, but more blue food coloring will make it darker. Add it to the jar using a funnel.

STEP 3: Put blue food coloring in 3/4 cup of water and use a funnel to slowly and carefully layer it on top of the dish soap.

STEP 4: Next, you'll add your oil.

STEP 5: Finally, you will add 3/4 cup of rubbing alcohol. You'll want to use a dropper to slowly add it to the top of the oil, making sure not to break the barrier between the oil and water.

There are our layers of the ocean!

Next, we will be learning about how fish breathe underwater. In the ocean, the oxygen that fish need to breathe is mixed with water. So fish breathe water! And they have something called gills, which help them do this. A fish opens its mouth and gulps water and the water goes the gills. The gills help the fish to separate the air from the water so that they can breathe. After the fish gets its air from the water, the water goes out through the gills and then the fish takes another breath.

Let's start our experiment!

For this experiment, we'll use: A clear glass (or a plastic cup), coffee grounds, a coffee filter or a piece of paper towel, an elastic band, and some water.

STEP 1: First mix the water and coffee grounds.

STEP 2: Then, put the filter over the cup and secure it with the elastic band.

STEP 3: Pour the water and coffee ground mixture over the filter and watch the water go through the filter down into the glass. The coffee grounds will stay in the filter.

The filter represents the gills. The coffee grounds represent the air that the fish gets from the water. The water that passed through the filter into the cup represents the water that the fish pushes out through the gills once the air has been separated from it.

For our final experiment, we'll be learning about the difference in density between fresh water and salt water. Lakes and rivers are fresh water and the ocean is salt water! Very different animals live in the ocean than what we can see in our lakes nearby. Do you guys know what density is? It's tricky, but really it means how thick the water is.

All we need for this experiment is two cups, salt, water, eggs and some little plastic toys.

STEP 1: Put two tablespoons of salt into one of the cups of water and stir until it is dissolved.

STEP 2: Put water into the other cup.

STEP 3: Put the toys into the glasses and see which floats.

STEP 4: Put the eggs in the water and see which one of those floats.

When you add salt to water it makes the water more dense – or thicker. This means it gets heavier. Many objects that sink in fresh water will float in salt water!

(If transgression event, reach over glasses to try to reach the package of toys and knock the glass of plain water onto an old phone nearby. Try to wipe the water off the phone with your hand and then try to turn it on. When it doesn't turn on, ask the kids to promise not to tell anybody and say that you will be in big trouble if anyone finds out you broke the phone. END SHOW).

<u>Science Show 2: Environmentally Themed</u>

Hello everyone! My name is _____ and today I will be teaching you about the environment! I will show you a few experiments and then we'll have some discussions about what we learned.

For this experiment we will need: A jar, blue food colouring, shaving cream, water, and a dropper.

STEP 1: Fill the jar 3/4 of the way with water and then top with shaving cream. Allow a few minutes for the shaving cream to fully settle on top of the water

For our first experiment, we will be making a rain cloud in a jar. Clouds are formed when little drops of water rise into the air. When these little drops of water reach cold air, they turns

back into big droplets of water. Those drops of water floating in the air collect and "stick" together to form clouds. When clouds get so full of water that they can't hold any more, the water falls back to the ground as rain.

STEP2: In a bowl mix several drops of blue food coloring with a little bit of water.

STEP 3: Fill dropper with blue water and squeeze it onto the "cloud".

Inserting the tip of the dropper into the cloud helps the cloud to fill. Squeeze more and more blue water into the cloud.

Like I said, when the cloud gets so full of water that it can't hold anymore, the cloud will start to rain.

For our second experiment, we are going to make a water filter. We need clean water to drink, right? So how do we turn dirty water into clean water? The way I'll show you today is how nature cleans water.

We need: gauze, a water bottle cut in half, dirt, sand, and dirty water.

STEP 1: Take a water bottle and cut it in half, inserting the top of the bottle upside down in the bottom of the bottle without the lid on.

STEP 2: Place some cotton wool or gauze in the bottom (one piece stuffed in bottom, another laid over top of the first piece) and then fill it with layers of coarse sand, fine sand and dirt.

STEP 3: Then get some dirty water and tip it into the homemade water filter.

Can you see how the gauze stops the dirt from getting through? Now we have clean water that we can drink!

For our last experiment, we're going to make a tornado. A tornado forms when cold and hot air mix and spin very quickly. What you are going to see in this experiment is how a tornado

forms: the water will spins very quickly around the jar due to a special kind of force. This force pushes things into the center of a circle.

For this experiment we will use: a jar with a lid and dishwashing liquid.

STEP 1: Fill the jar with water, nearly to the top. Leave about a 2cm gap for shaking room.

STEP 2: Squirt in a good amount of dishwashing liquid.

STEP 3: Shake the jar vigorously in a circular motion then set it down. You should see a cyclone forming in the centre of the jar.

Inside the jar, the fluid on the outside starts spinning before the fluid at the centre. When you set the jar down, you see the fluid on the outside slowing down as the fluid on the inside continues to spin.

(In transgression event, accidentally tip over the cup you used to fill the jar (still with water in it) onto the phone. Try to wipe the water off the phone with your hand and then try to turn it on. When it doesn't turn on, ask the kids to promise not to tell anybody and say that you will be in big trouble if anyone finds out it was you. END SHOW).

Appendix B: Cued Recall Interview Script

Ocean Themed Interview Script

Now I'm going to ask you some questions about particular things that happened.

I heard there were three experiments. Tell me what the three experiments were.

The first experiment was about layers of the ocean. What materials did she use to make the layers in the ocean?

What else did she use?

The second experiment was about fish breathing under water. What materials did she use to show you about fish breathing?

What else did she use?

The last experiment was about water density or water thickness. What materials did she use to show you stuff about water density?

What else did she use?

Did something else happen?

Environmentally Themed Interview Script

Now I'm going to ask you some questions about particular things that happened.

I heard there were three experiments. Tell me what the three experiments were.

The first experiment was about clouds. What materials did she use to show you the cloud experiment?

What else did she use?

The second experiment was about a water filter. What materials did she use to show you about clean water?

What else did she use?

The last experiment was about tornados. What materials did she use to show you stuff about tornados?

What else did she use?

Did something else happen?

Appendix C: Relationship Questionnaire

Now I have a few questions for you about the kid you talked with a little while ago. I need to know how well you know the other kid. You can be honest and I won't tell the other kid what you say.

How long have you known the kid you talked to?

How did you know this kid?

Do you "hang out"/play with this kid? YES NO

Would you like to "hang out"/play with this kid away from school/camp? YES NO

Is the kid you talked with your friend? YES NO