RUNNING HEAD: Inferring affiliation and status from imitation

# Children infer affiliative and status relations from watching others imitate

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Abstract

We investigated whether young children are able to infer affiliative relations and relative status from observing others' imitative interactions. Children watched videos showing one individual imitating another and were asked about the relationship between those individuals. Experiment 1 showed that 5-year-olds assume individuals imitate people they like. Experiment 2 showed that children of the same age assume that an individual who imitates is relatively low in status. Thus, although there are many advantages to imitating others, there may also be reputational costs. Younger children, 4-year-olds, did not reliably make either inference. Taken together, these experiments demonstrate that imitation conveys valuable information about third-party relationships and that, at least by the age of five, children are able to use this information in order to infer who is allied with whom and who is dominant over whom. In doing so, they add a new dimension to our understanding of the role of imitation in human social life.

**Children infer affiliative and status relations from watching others imitate**

Imitation, or reproducing the observed actions of others, plays a critical role in learning about the physical world (Flynn & Whiten, 2010; Gergely & Csibra, 2005; Horner & Whiten, 2005; Tomasello, 1999). Through imitation, we learn, among other things, how to find and prepare food, how to make and use tools, and how to build shelter against the elements (Boyd, Richerson, & Henrich, 2011; Flynn & Whiten, 2008). In addition to helping us learn about the physical world, imitation plays an important role in learning about the social world. By copying those around us, we learn the conventions of our group, how to communicate with others, and how to interact with them (Heyes, 2013; Kenward; 2012; Rakoczy, Warneken, & Tomasello, 2008). In short, we learn how to be good group members (Over & Carpenter, 2012; 2013).

Beyond its role in learning about the physical and social world, imitation plays a key role in regulating our social relationships. Experimental research with adults has shown that we use imitation as a way to affiliate with others. Lakin and Chartrand (2003), for example, have demonstrated that we copy the actions of a social partner more closely when we have been primed with affiliation (see also Lakin, Chartrand, & Arkin, 2008). Being imitated also has positive social-affiliative consequences: Chartrand and Bargh (1999) have shown that when a social partner mimics our actions, we like them more. The role of imitation is not limited to affiliative relationships, however. Other research has shown that we use imitation as a means by which to regulate hierarchical social relationships. For example, adults are more likely to imitate high status individuals (the so-called 'prestige bias'; Henrich & Gil-White, 2001).

Research on these social regulatory functions of imitation has focused

almost exclusively on participants' own imitation or reactions to being imitated. However, imitation often takes place within a broader social context (Kavanagh, Suhler, Churchland, & Winkielman, 2011; Nielsen, 2009; Over & Carpenter, 2012; 2013) and imitative interactions are regularly observed by others. This means that, in principle, we may be able to use our observations of others' imitation to extract information about their relationships, for example, to infer who is allied with whom and who is dominant over whom.

If imitation plays a role in our ability to infer the nature of third party relationships, then it may also have reputational consequences. It is often pointed out that, both when imitation is used to learn and when it is used to affiliate, it brings advantages to the imitator. When we learn a new skill through imitation, we avoid the time-consuming, error-prone, and sometimes dangerous process of acquiring the skill through trial and error, and we can acquire capabilities that, due to their complexity, would be impossible to learn on our own (Gergely & Csibra, 2006; Tennie, Call, & Tomasello, 2009; Tomasello, 1999). Furthermore, when we imitate during a social interaction, we increase the probability that our social partners will bond with us, and even increase the probability that they will help us in the future (van Baaren, Holland, Kawakami, & van Knippenberg, 2004). However, imitation may also have some reputational costs. For example, if we are more likely to imitate people who are higher status than ourselves, imitation might signal to onlookers that someone who imitates is lower in status than the person he or she imitates. As high status is generally seen as desirable, and is often sought after within social interactions (Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013; Henrich & Gil-White, 2001; Martens, Tracy, & Shariff, 2012), being observed imitating another may have

some disadvantages.

Previous research with adults has shown that they are able to determine the nature of third party relationships from the interactants' nonverbal behavior and that the amount of imitation within the interaction may inform these judgments (Grahe & Bernieri, 1999). Other research has shown that an individual's imitative behavior can influence how he or she is perceived by adult onlookers. Bavelas, Black, Lemery, and Mullett (1986), for example, showed that individuals who copy a victim's pained expression are thought by raters to care more about the victim's suffering. In other research, Kavanagh et al. (2011) presented participants with videos in which an individual copied the mannerisms of either a cordial or a condescending interviewer. Participants rated this individual as competent when he copied the mannerisms of the cordial interviewer but incompetent when he copied the mannerisms of the condescending interviewer.

Here, we explore what imitation might convey to onlookers about two types of social relationships: affiliation and relative status. In order to investigate just how deep-rooted the ability to use imitation to make these types of judgments is, we chose to investigate these questions in young children. Below we review the developmental evidence that led us to hypothesize that even children might show these abilities.

First, we hypothesized that children may be able to use observations of others' imitation to infer whether individuals have a positive, affiliative relationship. We did so because previous research has demonstrated that imitation is linked with affiliation in children's own interactions, just as it is in adults' (Nielsen, 2006; 2009; Over & Carpenter, 2012; 2013). Over and Carpenter

(2009b), for example, demonstrated that 5-year-old children copy the actions of a model more closely when affiliation is important to them; that is, when they have been primed with the threat of exclusion from the group as opposed to when they have been given a more neutral prime (see Watson-Jones, Legare, Whitehouse, & Clegg, in press, for a replication and extension of this result). Furthermore, Nielsen and Blank (2011) demonstrated that 4- to 5-year-old children are more likely to copy the specific actions of a model when she is present to watch their imitation than when she leaves the room (see also Haun & Tomasello, 2011; Király, 2009). Children also respond positively to being imitated from very early in development (e.g., Meltzoff, 1990). For example, 18-month-olds are more likely to help an experimenter who has previously copied their actions than they are to help one who has engaged in equally contingent but non-imitative behavior (Carpenter, Uebel, & Tomasello, 2013) and older children (5- to 6-year-olds) are more likely to trust an experimenter who has copied them (Over, Carpenter, Spears, & Gattis, 2013). This close connection between imitation and affiliation in children's own behavior makes it plausible that children will be able to recognize a link between imitation and affiliation in their observations of third party interactions.

Beyond affiliation, children might also be able to use observations of others' imitative behavior as a means by which to infer relative status. Recent research has shown that even preschool children are sensitive to differences in status (e.g., Brey & Shutts, in press; Horwitz, Shutts, & Olson, in press). Furthermore, there are hints from previous research that status differences are associated with differences in children's imitative behavior. For example, Bandura, Ross, and Ross (1963) showed that 3- to 5-year-old children are more

likely to copy an individual who controls resources than an individual who consumes those resources. In related research, Chudek, Heller, Birch, and Henrich (2011) have demonstrated that children show the 'prestige' bias in their imitation: 3- and 4-year-old children are more likely to copy the actions of a model who has been the subject of others' visual attention. The connections between imitation and status in children's own imitative behavior suggest that they may be able to recognize a general link between imitation and relative status and use it when observing others to infer who is dominant over whom.

In the experiments we report here, we presented children with videos in which one individual imitated another and then asked them questions about the nature of the relationship between the individuals involved. In Experiment 1, we test whether children are able to use imitation as a means by which to infer affiliative relations. In Experiment 2, we test whether children are able to use imitation as a means by which to infer relative status.

We began by testing these predictions with 5-year-old children. We wanted to focus on an age group that could not only make judgments about imitative interactions but potentially explain those judgments to us as well. In addition, imitation researchers have recently focused a great deal of attention on this age range (e.g., Lyons, Young, & Keil, 2007; Horner & Whiten, 2005; Nielsen & Blank, 2011; Wood, Kendall, & Flynn, 2012) and, in particular, on the question of how social their imitative behavior is (e.g., Lyons et al., 2007; Over & Carpenter, 2012; 2013). By focusing on children in this age range we hoped to be able to contribute to this debate. Once we obtained results from the 5-year-olds, we decided to test a sample of 4-year-olds as well in order to examine

whether younger children could make these inferences. In doing so, we started to address the question of developmental change in this ability.

## Experiment 1

In this experiment, we investigated whether children can infer affiliative relations from observing others' imitation. We presented children with videos in which a central character imitated one of two other individuals. Following the video presentation, we asked children who they thought the central character liked more. We predicted that children would infer that the central character preferred the individual she had imitated. In order to check that children were basing their decisions on the imitation rather than some other factor, we also asked them to justify their choices.

### Method

*Participants*

Participants were 40 five-year-olds (mean age 5 years, 6 months; age range 5 years, 0 months – 5 years, 11 months) and 40 four-year-olds (mean age 4 years, 5 months, age range 4 years, 0 months – 4 years, 11 months). Forty of the participants were female and 40 were male. An additional 5-year-old was tested but excluded from analyses for failing to respond to the test questions. Five additional 4-year-olds were tested but excluded for failing to make a clear choice at test, that is, refusing to point to either individual or pointing to different individuals across the course of the experiment (4) or experimenter error (1).

Children in both experiments were tested in their kindergartens in a middle-sized town. Although no specific demographic data were collected,

participants came from mostly middle-class backgrounds, and approximately 98% of the population from which the sample was drawn is native German. The parents of all children who participated had given prior consent for their participation.

*Materials*

Children watched a video lasting approximately 90 seconds in which three women, dressed identically, sat on the floor side-by-side, equidistant from each other (see Figure 1). In the video, the individuals on each side of the display performed a series of contrasting actions in turn and the woman in the center reacted to this by imitating one of them but not the other. First, one of the individuals (counterbalanced) changed her sitting position (e.g., she crossed her legs), and then the other individual changed her sitting position in a different way (e.g., she moved both legs to one side). After this, the woman in the center reacted. She began by looking, with a neutral facial expression, at each of these individuals in turn, attending to each of them equally. She then imitated one of them (the same one each time), for example by crossing her own legs. As she did this, she looked directly into the camera (rather than at either of the peripheral individuals). A similar sequence of events followed for three further sets of actions. Each time, after the peripheral individuals had performed their actions and the woman in the center had looked at both individuals in turn, the woman in the center imitated one of them: she chose the same color scarf that one of the individuals had chosen to put on (e.g., yellow rather than green), then the action that that individual had performed on an object (e.g., rolling a colored tube between her hands as opposed to along the floor) and finally, the way she sat

once more (e.g., with her knees pulled up to her chest as opposed to out to one side). For counterbalancing purposes, two versions of this video were created, one in which the central individual imitated each of the two peripheral individuals. The video was presented on a laptop computer placed on a child-sized table.

*Procedure*

The experimenter (E) invited children individually into a quiet room in their kindergarten and asked them to sit in front of the computer screen. E introduced the video to children by drawing their attention to the start screen (showing the three individuals seated on the floor facing the camera) and saying, "Now you can watch a video. The video shows three people." She then pointed to the central individual and said, "This person likes one of these two people better than the other one [pointing in turn to the individuals on the left and right of the central character]. After you've watched it, I want you to tell me which person she likes better." Once children had watched the video, E pointed once more at the central individual and said, "She likes one of these two people better than the other. Who do you think she likes more, her or her?" [pointing once more to the peripheral individuals on the left and right]. Once children had responded by pointing at one of the two individuals, E asked them to justify their decision by saying, "Why do you think she likes her more?" If children did not respond to a question, E repeated it. Once children had answered the justification question, the procedure was complete. E thanked them for their participation and took them back to their classroom.

*Coding*

Children responded to the question 'Who does she like more?' by pointing to one of the two peripheral individuals. These responses were coded from video by the first author. Children's responses to the question 'Why do you think she likes her more?' were later transcribed from video by the experimenter. These responses were then coded into three categories by the first author. The first category consisted of responses that referenced imitation explicitly, such as "because she copied everything" and "because she copied what she did." The second category consisted of responses that referenced imitation more implicitly, for example "because she rolls with the hands and took yellow." The third category consisted of irrelevant responses, for example "I don't know" or "because I think that," or no response at all.

A rater who was unaware of the hypothesis of the experiment independently coded a randomly-chosen 25% of the data at each age. For the 5-year-olds, agreement was perfect for the question 'Who does she like more?' and 80% for the question 'Why do you think she likes her more?' (Cohen's *kappa* =.64). For the 4-year-olds, agreement was perfect for both the question 'Who does she like more?' and for the question 'Why do you think she likes her more?'

## Results and discussion

*Five-year-olds*

Preliminary analysis of the data revealed no effect of the counterbalancing of the individual who was imitated ($X^2(1)=.14$, $p=.71$) and no effect of children's gender ($X^2(1)=.14$, $p=.71$) on performance. As a result, the

data were collapsed across these variables and the distinctions are not considered further.

Overall, 77.5% of 5-year-olds inferred that the central individual liked the individual she imitated, and 22.5% inferred that she liked the other individual. This difference is significant ($X^2(1)=12.1$, $p<.001$, $r=.55$). Turning to the justifications, of those children who answered in the predicted direction, 87.1% referenced imitation explicitly, 6.5% referenced imitation more implicitly, and 6.5% made no reference to imitation at all or failed to justify their decision. These results demonstrate that 5-year-old children are able to infer affiliative relations from observing others' imitation. Furthermore, they show that children often have explicit awareness of the role imitation plays in this inference as indicated by their answers to the justification question.

*Four-year-olds*

Preliminary analysis of the data revealed no effect of counterbalancing ($X^2(1)=.10$, $p=.75$) and no effect of children's gender ($X^2(1)=.10$, $p=.75$) on performance. We thus collapsed across these variables and do not consider them further.

Overall, 57.5% of 4-year-olds inferred that the central individual liked the individual she imitated, and 42.5% inferred that she liked the other individual. Unlike the 5-year-olds, this difference does not reach significance ($X^2(1)=.9$, $p=.63$). Turning to the justifications, of those children who did answer in the predicted direction, only 21.7% referenced imitation explicitly in their justification, 8.7% referenced imitation more implicitly, and 69.6% either made no reference to imitation at all or failed to justify their decision. Thus, as a group,

4-year-olds did not show evidence of understanding that imitation conveys information about liking. However, a small minority of children (12.5% of the total sample) both answered correctly and justified their answer appropriately, suggesting that some 4-year-olds might be able to make this type of inference.

*Age comparison*

In addition to examining performance in the two age groups separately, we also compared them. A chi square test of independence revealed that there was a trend for the 5-year-olds to choose the individual the central character imitated more often than did the 4-year-olds ($X^2(1)= 3.65$, $p=.056$). In a second analysis, we took children's justifications into account by comparing the number of children who both answered correctly and justified their answer by explicitly referencing imitation at each age. Another chi square test of independence revealed that significantly more 5-year-olds than 4-year-olds did this ($X^2(1)=25.21$, $p<.0001$). Thus the ability to infer affiliative relations from observing imitative interactions as measured by this paradigm improves between the ages of four and five.

## Experiment 2

In this experiment, we investigated whether children are able to make inferences about a different type of social relationship, relative status, from watching others imitate. We presented children with videos in which one individual imitated another and then asked them which individual was the boss (we chose the word 'boss' as we reasoned that it would be much easier for young children to understand than the more technical term 'status' while still capturing

the hierarchical nature of the relationship). We predicted that, in this situation, children would infer that the imitator was relatively lower in status than the individual who was imitated. As low status is generally seen as undesirable both by adults (Cheng et al., 2013; Henrich & Gil-White, 2001; Martens et al., 2012) and children (Hailey & Olson, 2013; Horwitz et al., in press; Newheiser, Dunham, Merrill, Hoosain, & Olson, 2014), we thus start to test whether imitating another might have negative reputational consequences.

## Method

### *Participants*

Participants were a new sample of 40 five-year-olds (mean age 5 years, 5 months, age range 5 years, 0 months – 5 years, 11 months) and 40 four-year-olds (mean age 4 years, 5 months, age range 4 years, 0 months – 4 years, 11 months). Forty of these participants were female and 40 were male. Three additional 5-year-olds were tested but excluded for failing to provide a clear response (2) and experimenter error (1). Six additional 4-year-olds were tested but excluded for failing to provide a clear response (5) and experimenter error (1).

### *Materials*

Children watched a video lasting approximately 60 seconds in which two women sat side-by-side on the floor (see Figure 2). In this video, one woman performed a series of actions and the other woman imitated her. In order to enable comparison across experiments, the actions presented in the status video were matched as closely as possible to those used in the liking video. First the imitator copied the other individual's seating position (legs crossed), then her

choice of scarf (green rather than yellow), then her action on an object (rolling a colored tube between her hands), and finally her seating position once more (sitting with her legs stretched out in front of her). In order to ensure that any effects we found were not simply due to the fact that the imitator always acted second, the imitator also initiated some actions individually (i.e., half of the time she performed an action, e.g., moving a cup from one side of the floor to the other, alone). The number of times the two individuals looked at each other, as well as the quality of those (neutral) looks, was strictly controlled. For counterbalancing purposes, two videos were created, one in which each individual imitated the other. (As the two individuals sat in the same location for both videos this means that for one video the imitator was presented on the left of the screen and for the other video the imitator was presented on the right of the screen.)

*Procedure*

E invited children individually into a quiet room in their kindergarten and asked them to sit in front of the computer screen. E introduced the video to children by drawing their attention to the start screen (showing the two individuals seated on the floor) and saying, "Now you can watch a video. The video shows two people. One of these two people is the boss of the other. After you've watched it, I want you to tell me which of the two people is the boss." Once the video was finished E said, "One of these people is the boss of the other. Who do you think is the boss, her or her?" (pointing first to the individual on the left and then to the individual on the right). Once children gave a response, E asked them to justify their decision by saying, "Why do you think she is the

boss?" If children did not answer a question, E asked it again. Once children had answered the justification question, the procedure was complete. E thanked them for their participation and took them back to their classroom.

*Coding*

The procedure for coding the data and the coding categories were the same as those used in Experiment 1. Twenty-five percent of the data at each age was independently coded by a rater who was unaware of the hypothesis of the experiment. For the 5-year-olds, agreement was perfect for the question 'Who is the boss?' and for the question 'Why do you think she is the boss.' For the 4-year-olds, agreement was 90% both for the question 'Who is the boss?' and for the question 'Why do you think she is the boss?' (*kappas* = .71).

## Results and discussion

*Five-year-olds*

Preliminary analysis of the data revealed that, although there was a marginal effect of counterbalancing, it did not reach significance ($X^2(1)=2.85$, $p=.09$). There was no effect of children's gender ($X^2(1)=1.03$, $p=.311$). The data were therefore collapsed across these variables.

Overall, 67.5% of 5-year-olds chose the individual who was imitated as the boss, and 32.5% chose the imitator. This difference is significant ($X^2(1)=4.9$, $p=.03$, $r=.35$). Of those children who answered in the predicted direction, 44.4% referenced imitation explicitly in their justifications, 22.2% referenced it implicitly, and 33.3% either made no reference to imitation at all or failed to

justify their decision. Thus 5-year-old children are able to use imitation to make inferences about status relations as well as about affiliative relations.

*Four-year-olds*

Preliminary analysis of the data revealed no effect of counterbalancing ($X^2(1)=.1$, $p=.75$) and no effect of children's gender ($X^2(1)=.92$, $p=.340$ on performance. We thus collapsed across these variables and do not consider them further.

Overall 52.5% of 4-year-olds chose the individual who was imitated as the boss, and 47.5% chose the imitator. This difference is not significant ($X^2(1)=.1$, $p=.75$). Of those who did respond in the prediction direction, only 14.3% referenced imitation explicitly, 9.5% referenced it implicitly, and 76.2% either made no reference to imitation at all or failed to justify their decision.

*Age comparison*

A chi square test of independence on children's choices revealed that there was no significant difference in performance between the two ages, ($X^2(1)=1.86$, $p=.17$). In a second analysis, we took children's justifications into account by comparing the number of children who both answered correctly and justified their answer by explicitly referencing imitation at each age. Another chi square test of independence revealed that significantly more 5-year-olds than 4-year-olds did this ($X^2(1)=6.65$, $p=.01$). There thus appears to be a similar developmental pattern in the understanding of how imitation relates to liking and status within this paradigm. We discuss why this might be in the General Discussion.

## General Discussion

With these experiments we focused on the broader social context in which imitation occurs. In particular, we investigated whether children can make a variety of different inferences about third party relationships from watching others imitate. In Experiment 1, we demonstrated that 5-year-olds can infer affiliative relationships from watching who imitates whom. In particular, they can infer that individuals imitate people they like. Children's justifications demonstrated that they often have explicit awareness of the role that imitation played in their decisions. This result adds a crucial piece of evidence to the argument that imitation serves social functions in development (Nielsen, 2009; Over & Carpenter, 2012; 2013). We now have converging evidence in favor of this claim from three different lines of enquiry. First, children use imitation themselves when they seek to affiliate with others (e.g., Nielsen & Blank, 2011; Over & Carpenter, 2009b). Second, children respond positively to being imitated (e.g., Carpenter et al., 2013; Meltzoff, 1990; Over et al., 2013). Third, as we have shown here, children infer information about affiliation from watching others' imitative interactions.

Experiment 2 demonstrated that 5-year-olds are also able to infer relative status from others' imitative behavior. In this experiment, children inferred that an individual who imitated someone else was lower in status. Children's justifications suggested that many children had either explicit or implicit awareness of the role imitation played in their decisions. We know from previous research that children are sensitive to differences in dominance from early in development (Mascaro & Csibra, 2012; Thomsen, Frankenhuis, Ingold-Smith, & Carey, 2011) and that they imitate high status individuals themselves

within social interactions (Bandura et al., 1963; Chudek et al., 2011). As far as we know, this is the first demonstration, at any age, that individuals are able to use observations of imitative behavior to infer others' hierarchical relationships. Whereas much previous research, both with adults and with children, has emphasized the positive role that imitation plays in regulating social relationships (Lakin & Chartrand, 2003; Lakin, Jefferis, Cheng, & Chartrand, 2003; Nielsen, 2006; Over & Carpenter, 2009b; van Baaren et al., 2004), this work suggests that, under certain circumstances, imitation may also have some negative consequences for the imitator (see also Kavanagh et al., 2011) in that it lowers his or her perceived status in the eyes of onlookers. Future research should investigate the nature and scope of these negative consequences in more detail.

In addition to contributing to the imitation literature, the current research contributes to the literature on children's understanding of third party relationships. Understanding the nature of the relationships between third parties is of paramount importance to children. When watching others interact in playgrounds or classrooms, for example, recognizing who is friends with whom and who is higher status than whom can help children to predict the outcome of interactions between others. We know from previous research that children are able to use cues like body posture and gaze to understand the nature of the relationships between others (Brey & Shutts, in press; Nurmsoo, Einav, & Hood, 2012). We extend this literature by showing that they are also able to use imitation as a cue to understanding their social world.

It is noteworthy that we saw a similar developmental progression in understanding in both the affiliation and status experiments. Whereas 5-year-

olds were able to infer both liking and status relations from observing imitation, as a group, 4-year-olds showed little evidence of being able to make either inference. Nevertheless, some 4-year-olds performed well on the tasks, not only answering correctly but justifying their answers appropriately. Furthermore, 4-year-olds' responses were in the same direction as those of the 5-year-olds and indeed, when the two age groups were directly compared, evidence for developmental change was equivocal. We are thus more inclined to interpret this as a gradual developmental change rather than a sharp distinction in understanding between 4 and 5 years of age. Nevertheless, it is interesting to speculate as to why 5-year-olds performed better in the two experiments. Intriguingly the developmental progression fits well with that found in another experiment investigating children's understanding of third party relationships. Nurmsoo et al. (2012) demonstrated that 5- and 6-year-olds but not 4-year-olds were able to infer who is friends with whom from observing their mutual gaze. One possible explanation for these results, following Nurmsoo et al., is that 5-year-olds simply have more experience negotiating friendship relations and dominance hierarchies than do 4-year-olds (see also Brey & Shutts, in press). It would be interesting for future research to investigate individual differences in social experience and competence and measure whether they correlate with performance on these tasks. However, it is also worth emphasizing that the failure of 4-year-olds on our tasks does not preclude the possibility that they might perform better on more implicit, nonverbal tasks. There is evidence that even infants understand something about third party affiliative relations (e.g., Over & Carpenter, 2009a; Kuhlmeier, Wynn, & Bloom, 2003) and relative dominance (Mascaro & Csibra, 2012; Thomsen et al., 2011). It will therefore be

important for future research to explore these questions, using more implicit measures, even earlier in development.

The present research adds to a growing body of evidence demonstrating just how deeply social imitation is (Nielsen, 2009; Over & Carpenter, 2012; 2013). By focusing on the broader social context in which imitation occurs, we have been able to demonstrate that children can draw on imitation in order to make inferences about others' relationships. By paying attention to who imitates whom, children can learn about the friendship and dominance relations that shape their social world. In doing so, this work provides a more complete view of the role of imitation in human social life.

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Figure Captions

*Figure 1.* Still frames from one of the videos used in Experiment 1. The central character imitating the woman on the left's a) seating position b) clothing choice c) action on an object d) seating position

*Figure 2.* Still frames from one of the videos used in Experiment 2. The woman on the right imitating the woman on the left's a) seating position b) clothing choice c) action on an object d) seating position

Figure 1.

Figure 2.