Preschool-aged children’s adherence to style conventions in a simple game.

by

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Abstract

Style conventions are specialized ways of performing a given activity (e.g., dressing, eating, etc.) that have minimal practical significance, but play a crucial role in signalling ones membership or status within a particular social community. The primary goal of this study was to examine whether preschool-aged children would adhere to a novel style convention simply given information that the style was shared by others. A secondary goal was to investigate whether the way that the information about the style convention was framed would affect their adhering to that convention. Forty-eight five-year-olds and 48 three-year-olds were shown a novel apparatus and given a basket of yellow and orange balls. The simple game consisted of putting the balls into the apparatus, which made the apparatus light up. In a fully between-subjects design, half of the participants participated in the focal “convention” condition, in which they were then told that using one colour of balls was the norm. Half of the children in the convention condition received this information in inclusionary terms (ie. everybody uses orange), and half in exclusionary terms (ie. nobody uses yellow). Children’s performance in these focal conditions was compared with that of children who participated in control conditions in which the experimenter’s ball choice was explained by statement of her preferences (i.e. I like to use only orange/I don’t like to use yellow). The main finding was that when playing the game themselves, 3-year-olds were significantly more likely to systematically select target-coloured balls in the convention than in the preference control condition, whereas 5-year-olds did not show systematic performance in either. There was also a significant condition x frame interaction, whereby children were more likely to systematically select target balls in the preference exclusion frame than in the preference inclusion frame.
These results show that explicit information about a shared style is sufficient to promote adherence to style conventions in 3-year-old children, though, perhaps not 5-year-olds. These findings are discussed with respect to the mechanisms that guide children’s acquisition of conventional forms across domains.
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Chapter 1: Introduction

Human beings are inherently social animals. We live primarily in groups, and rely on one another for practical assistance to complete tasks, for company and comfort, and to share knowledge. Some of the knowledge we share – the distance between the earth and the sun, for example, or the structure of a cell – is, in a practical sense, naturally stipulated and generally considered to be objective (Kalish & Sabbagh, 2007). There is another type of knowledge, however, that is equally important – indeed, it is knowledge that is imperative to the success of each and every interaction that we have with another person. Conventional knowledge is knowledge that is not just socially transmitted, but socially determined. It is knowledge created and disseminated by other people, and includes a wide range of phenomena such as language, tool use, rules for games, and behavioural style conventions. Conventional knowledge is unique in that outside of the context of the social group within which the knowledge was created, a particular form will not carry its usual meaning. For example, group consensus in China dictates that to use chopsticks for any purpose other than for eating is abominably rude and vulgar, but one will often see chopsticks in North America serving as hair accessories or plant stakes. Social conventions are not only specific to groups of people, but may also be specific to a particular context; outside of a soccer game, for example, it is permissible to touch a soccer ball with one’s hands, but there is collective consensus that it is prohibited in the midst of a game of soccer.

Although it is physically possible to violate these conventional forms, people tend not to do so. In everyday context, the words we use are meaningful, the appropriate
function of tools are (at least partially) prescribed, and the rules of our games are stable across players and instances of a particular game. In each of these cases, these forms have prescriptive weight because the members of a given community have collectively agreed that they are ‘correct’.

Conventional forms often have a practical function. In the case of tool use, for example, using an implement in a conventional way is generally more efficient than using a non-conventional, but equally plausible alternative. Using a standard language is essential for effective communication (Bergman, Watrous-Rodriguez, & Chalkley, 2008). Playing by the set rules of a game allows you to compete with others and master the practice. However, there are some conventional forms that do not have any apparent practical function. These conventions, which we will call “style conventions,” are ways of behaving that evolved exclusively as a means of defining a cultural or social group. These style conventions include things such as appropriate dress for a game of golf, the correct fork to use for salad during a formal dinner, and the serving of cake at a birthday party. We do these things, not because of some obvious practical benefit, but because they please other members of our group and reinforce our sense of belonging.

Considerable work exists looking at children’s acquisition of the conventional forms that confer obvious practical efficiencies, such as language (Sabbagh & Henderson, 2007), tool use (Defeyter & German, 2003), and game rules (Rakoczy, Warneken, & Tomasello, 2008). To our knowledge, there are no studies looking at how children acquire style conventions. Thus, the aim of the current study was to provide an initial investigation of preschool children’s adherence to a new, arbitrary style convention if they are simply told that it is the norm.
The development of different types of conventional knowledge

All types of conventions have two significant related properties: they are shared by group members, and they are normative. There is evidence to suggest that children might learn about these features in different types of conventions at different points in development. For example, even infants are sensitive to the normative and shared nature of language. Koenig and Echols (2003) demonstrated that by 16 months infants expect that humans will use the conventional words for referents. In one study, infants listened to an adult or a loudspeaker labelling objects correctly (e.g., calling a cup a “cup”) and incorrectly (e.g., calling a cup a “shoe”). The 16-month-old infants showed surprise at the adult who violated the conventional ways of using labels, but not at the loudspeaker (Koenig & Echols, 2003b). Infants understanding of words as shared and normative is fairly sophisticated; by 19 months of age infants recognize that word meanings are shared and conventional, even though other kinds of information are not, such as people’s desires and preferences (Henderson & Graham, 2005).

Further evidence that young children understand the normative nature of conventions comes from studies of their understanding of games. In one study by Rakoczy, Warneken, and Tomasello (2008), an experimenter showed 3-year-old children a game with blocks called ‘daxing’. Then a puppet arrived and announced either that he was going to ‘dax’ or that he was just going to build, and in both cases proceeded to not play the game but just build with the blocks. Three-year-olds often corrected the puppet when he built with the blocks after announcing that he was going to ‘dax’, but seldom when he had expressed an intention to build. Preschoolers’ correction behaviour in these
circumstances is taken as indicating that they understood that the rules of games, though arbitrary, are normative and supposed to be followed (Rakoczy et al., 2008).

As children progress through the preschool years, they also begin to show an appreciation of the shared and normative features of conventions in the domain of tool use. In one study by Casler et al., preschool children were presented with two different objects capable of performing the same actions. An experimenter demonstrated one action on an object and then asked the children to perform a different action. The different action could be performed on either the same object that was used in the first action, or on a new object. Children as young as 2.5 years of age were much more likely to select the new object to perform the new action, even though the old object would have worked just as well. These results suggested that children had mapped a normative function onto Object A and were reluctant to use it for something other than what they perceived to be its intended use (Casler & Kelemen, 2005). Along these same lines, 3-year-olds will protest non-conventional use of a tool, even when the tool is only a tool by virtue of pretence. For instance in one study, three-year-olds protested when a puppet pretended to eat a clothes-pin that had been previously designated as a ‘knife’, insisting that it be used only to cut things (Rakoczy, 2007). These findings demonstrate that children have very strong tendencies to adhere to conventional uses for tools and, perhaps more importantly, they understand that these conventional uses are normative – violations are not simply unusual but they are “wrong.”

There is some evidence that children’s tendency to adhere to normative uses of tools gains strength with development. For instance, 5-year-olds can immediately provide the conventional function when they are asked what a common object is used for. Yet,
when pressed 5-year-olds are also able to conceptualize other potential uses of the common object if necessary (Defeyter & German, 2003). Seven-year-olds, in contrast, have serious difficulties conceptualizing alternative uses for common tools, to the extent that they will ignore possible and relatively obvious ways in which a common object might help them to solve a problem. These findings suggest that children believe that there is a normative, “right way” to use a tool independent of its physical affordances, and will adhere to that normative function independent of the tool’s more general affordances (Defeyter & German, 2003).

It is clear that children grasp the normative and shared aspect of many types of conventions fairly early in development. In addition to being shared and normative, however, conventions are also arbitrary: the form that a convention takes has no intrinsic value or relation to the convention. The word ‘spoon’, for example, has no special link to the utensil it refers to; it is essentially arbitrary. Likewise, there is nothing about a spoon that dictates that it must be only used for eating food – we, as a group, simply agreed that it was to be so. There is some evidence that children might find this aspect of conventional understanding a little more difficult than others. In one study testing this idea, investigators presented three- and four-year-olds with multiple scenarios, each featuring a character that wished to violate a natural law or a social norm (Kalish, 1998). The children were asked whether it was possible for the character in the story to violate the norm or law, and then asked to justify their response. Children in both age groups tended to report that the character “can’t” violate both the social norms and the natural laws (Kalish, 1998). The reasons they gave for the inviolability of these rules, however, were different; children typically referred to the impossibility of violating natural laws,
but referred to the impermissibility of violating social norms (Kalish, 1998). These results suggest that preschool children do understand that social norms are different than natural laws, but does not inform specifically on whether they recognize the arbitrariness of social norms. In a follow-up study, Kalish (1998) used a similar paradigm, but provided the additional information that the character in the story was from somewhere else and did not know that they were not supposed to violate the natural law or social norm. The children were then told that the character wanted to break the natural law or social norm, and were asked if the character would proceed to do so. The 5-year-olds responded the majority of the time that the character would proceed to break the social norm, but almost never that he would break the natural law (Kalish, 1998). The 3-year-olds, however, responded at chance levels – they responded that the character would proceed to break the social norm much less often than did the 5-year-olds (Kalish, 1998). These results suggest that 5-year-olds have some understanding that social norms are arbitrary, as they believed that the character would likely violate a norm about which they were in ignorance. Three-year-olds, however, may not yet grasp that conventions are arbitrary, as they often stated that the character would not violate a norm they were not aware of, suggesting that they might believe that social norms have some essential derivation.

Children’s understanding of the arbitrariness of conventional forms may have important implications for their understanding of style conventions. As noted above, style conventions have no direct practical benefit beyond their social implications. Thus, it seemed possible that children may be less likely to adhere to them early in development, because the lack of practicality might cause children to question why they are necessary.
We therefore tested 3- and 5-year-olds in order to assess their sensitivity to style conventions.

The three aspects of conventions, that they are shared, normative, and arbitrary have different implications for style conventions. That they are shared and normative means that they have intrinsic social value, and might strongly bias an individual to adhere to the style convention. That they are also arbitrary, however, means that style conventions, having no purpose beyond social inclusion, are intrinsically unnecessary in any practical sense. If children in the current study do in fact grasp that style conventions are shared, normative, and arbitrary, an interesting question is which aspects will have a greater influence on behaviour. Given the considerable body of research showing that young children will adhere to a novel tool or game convention, and that they appreciate the shared and normative aspect of conventions, we predict that the children in our study will adhere to the novel style convention because they have information that it is shared and normative.

The development of attitudes about conventions

While children’s understanding of conventions is likely to play some role, children’s tendencies to adhere are also likely to be affected by their attitudes. That is, children may know all about conventions, but still be indifferent to the benefits of acting in accordance with them. Thus, a critical question concerns how important children think it is to adhere to conventions. As noted above, even infants notice transgressions in linguistic conventions (Koenig & Echols, 2003a). The fact that infants attend to violations of conventions suggests that there may be some early motivation to track those who are or are not acting in conventional ways. Yet, the premium placed on conventional
behaviours appears to change as children get older. That is, children view transgressions of established conventions as increasingly unacceptable as they progress from preschool to early elementary school (Smetana, 1981; Smetana, 1985; Yau & Smetana, 2003). In one study (Smetana, 1981), 3- and 4-year-olds heard story vignettes depicting conventional transgressions (eg. a child not sitting in the designated place during story time). They were then asked if it would be ok to transgress in that way in a different location (eg. home vs. school), and if it would be ok to transgress if there was no rule specifically prohibiting it. In both cases, 3-year-olds were more likely than 4-year-olds to say that convention violations would be permissible. These results suggest that younger children view adherence to conventions as being more flexible than do older children.

In another study, Yau and Smetana (2003) presented 3- to 6-year-olds with vignettes about a child who violated an established social convention (eg. eating messy food with hands instead of a spoon), and asked them questions about the transgression. The 5- and 6-year-old group saw the conventional transgressions as less permissible than the 3- and 4-year-old group, and were also less likely to affirm that a personal choice to go against the accepted norm was tolerable (Yau & Smetana, 2003).

With age, then, seem to become increasingly reluctant to flout behavioural conventions, and increasingly intolerant of those who do not conform to the norm as they get older. The current study will examine whether 3- and 5-year-olds will show the same pattern of development when presented with information about a new style convention. In keeping with the aforementioned trend, we predict that the 5-year-olds will be less likely to violate the stated style convention than will the 3-year-olds.
What motivates learning?

By the time children reach elementary school they have already gained considerable knowledge about conventions. As noted above, in many cases learning about conventions is highly beneficial, because the conventional form represents a highly efficient manner of coordinating a solution to either a social or practical problem. Learning the shared symbols in a language, for example, is essential in order to communicate efficiently with other group members, to convey needs and to co-ordinate behaviour (Sabbagh & Henderson, 2007). Similarly, learning the rules of a game such as chess enables you to share and enjoy time with another person. In the case of style conventions, however, the reasons for adhering to these forms are less obvious. For example, classic “business attire” specifies that dress shoes should be worn in a formal office setting, though wearing sneakers would arguably be more functional with respect to the goal of comfortably protecting ones feet. Why then, might children adopt and adhere to these arbitrary style conventions when they are not strictly necessary for achieving practical goals?

On possibility is that children, in fact, do believe that style conventions are necessary in a practical sense – that they do not understand that they are arbitrary and can be violated. The studies by Kalish (1998), however, suggest that in at least one important way this is not the case: 3- and 5-year-old children alike tended to give explanations using social reasons for why it was unacceptable to violate social norms, and explanations referencing physical impossibility for why it was unacceptable to violate natural laws (Kalish, 1998). These results indicate that 3- and 5-year-olds understand that it is possible to violate conventions. A further finding of the study demonstrated that
3-year-olds may still have gaps in their understanding of conventions, however, as they seem not to understand that conventions are arbitrary. Three-year-olds tended to report that people who were not aware of a convention would still adhere to it, suggesting that, although they understand that conventions are not imperative, they may still believe that conventional forms have some non-trivial significance (Kalish, 1998).

Another possibility is that children may be motivated to learn conventions through conditioning by adults and peers. Naturalistic observation studies indicate that adults and peers regularly provide negative feedback in response to children’s violation of conventional norms (Nucci & Nucci, 1982a; Nucci & Nucci, 1982b; Nucci, Turiel, & Encarnacion-gawrych, 1983; Smetana, 1989). An observational study of toddlers in their homes found that mothers responded to conventional transgressions by 3-year-olds with a threat of sanctions (eg. ‘if you don’t sit down while you eat you will get a time out!’) (Smetana, 1989). Children also respond to the conventional violations of their peers. Observational studies in schools have shown that even 3-year-olds will respond unfavourably to violations of rules in games (Nucci et al., 1983), and that as they progressed from age 7 to age 14 they increasingly responded to violations of social norms with ridicule (Nucci & Nucci, 1982a; Nucci & Nucci, 1982b). It is possible, then, that children learn behavioural style conventions through instruction, punishment, and reinforcement by adults and peers.

A third, intriguing possibility is that children are motivated to learn conventions simply because doing so gives them the skills they need to become a member of their community. As many have noted, adhering to conventions of all sorts, including social conventions, serves to mark your inclusion in a particular group (Kalish & Sabbagh,
There is some reason to suspect that this non-coercive social motivation might be a critical factor in young children’s learning of conventions. For instance, there is evidence that social inclusion concerns are very salient for young children; in one study of 125 kindergarten children, the reports of five-year-olds revealed that they worried about peer relationships more than any other concern (Ladd, 1990). Other studies looking at the causes of social exclusion in childhood indicate that children who possess individual characteristics that are “different” are often rejected (Harrist & Bradley, 2003). Although the issue has not been explicitly studied, it seems likely that children whose behaviour is “different” might also be at greater risk for ostracization. Skilfully acquiring conventions of all sorts might be one of the primary ways in which children might identify with peer groups and thus “fit in” with the members of their immediate and extended communities.

There are at least two strategies that an intrinsically socially motivated learner might adopt to efficiently acquire conventional forms. One potentially straightforward strategy for learning conventions is to simply imitate the actions of surrounding individuals. A child wishing to master the conventions of a given community might reasonably assume that actions modeled by a member of that community is the accepted mode, and use the example as a template to guide their own behaviour. In some cases, such as tool use, this seems to be the case – young children will imitate an action on a tool after witnessing another person perform that action (Carpenter, Tomasello, & Savage-Rumbaugh, 1995; Casler & Kelemen, 2005). It is noteworthy, however that a simple imitative strategy could frequently lead to error in the case of style conventions. Others' actions are not guaranteed to be conventional. The behaviour might reflect the
model’s idiosyncratic preference for a particular way of doing something. For instance, an office worker with back problems might sit on the floor of their cubicle instead of in their chair. Alternately, the model of interest might be unaware of the convention, or may hold a conflicting conventional form. An American travelling in Japan, for example, might fail to take off their shoes upon entering a private home, a behaviour practiced consistently in the United States, but considered a severe breach of propriety in Japan. Children must be able to sift through myriad behavioural examples and successfully identify the stylistic conventions in the noise.

Perhaps rather than using a single example as a template to imitate, children use statistical information from their environment, and imitate actions that they see often repeated by members of their community, without really appreciating the social significance of the actions (Tomasello & Rakoczy, 2003). There is evidence, however, that this is not the case, evidence that young children are not simply using statistical information about the frequency of a particular form to guide their actions, but rather specifically perceive the normative aspect of conventional behaviour. This was demonstrated in the study by Rakoczy, Warneken, and Tomasello (2008); when the puppet claimed that he was going to ‘dax’ and proceeded to build the children often corrected the puppet, even though building with blocks is actually a more common activity (Rakoczy et al., 2008).

A third possibility is that children learn important conventions via direct information from an informed individual – that a person who knows the convention simply tells the child what other people typically do. There is evidence that informed individuals do give very young children explicit information about specific conventions.
For instance, an observational study of toddlers in their homes found that mothers typically responded to conventional transgressions by 2-year-olds with a statement of the rule or proper behaviour (eg. ‘we sit down when we eat’) (Smetana, 1989).

The current study investigated whether providing explicit information that a style convention is normative is sufficient to elicit that behaviour in young children, if they do not directly receive social consequences or disapproval when they violate that convention.

**Framing**

Given that conventions are socially determined, and that humans are highly motivated to achieve social acceptance, it follows that children might be motivated by cues that a given behaviour is both shared by other members of the community and is considered important enough that there may be attendant social consequences to adherence or non-adherence. There are two ways in which information about the social importance of adhering to a convention might be framed; that observance will result in social inclusion, or that non-compliance will result in social exclusion. Although functionally similar, there is some reason to believe that children might be more motivated by one over the other.

Support for the possibility that effect differences in framing might exist come from Kahneman and Tversky’s Prospect Theory (1984). Prospect Theory proposed that the way that information is framed affects the likelihood of certain decisions and behaviour (Kahneman & Tversky, 1984; Tversky & Kahneman, 1981). Information conveyed in a “loss-frame” (which frames information in negative terms, as in potential losses) yields different behavioural outcomes than information conveyed in a “gain-
frame” (which frames information in positive terms, as in potential gains) – even when the terms of the problem are functionally equivalent (Tversky & Kahneman, 1981). A vast body of research supports the idea that people are more motivated to avoid losses than they are to achieve gains (eg. G. Y. Bizer & Petty, 2005; G. Y. Bizer, 2002; Rivers, Salovey, Pizarro, Pizarro, & Schneider, 2005; Rothman, Bartels, Wlaschin, & Salovey, 2006; Tversky & Kahneman, 1981). Kahneman and Tversky (1981) suggest that this is because humans are inherently motivated to maintain the status quo, and thus the prospect of losing something that you already possess looms larger than the prospect of acquiring something that you do not yet have. This phenomenon is closely linked to risk factors; in high-risk propositions people are more motivated by loss-frame messages, and in low-risk propositions people are more motivated by gain-frame messages (McCusker & Carnevale, 1995; Rivers et al., 2005). In terms of health-promoting behaviours, for example, messages framed in terms of the potential benefits of a healthy behaviour is most effective in promoting preventative measures, as the stakes are quite low if a condition does not yet exist; messages framed in terms of potential dangers of not engaging in a healthy behaviour are most effective in promoting detection measures, as the risk of already having a serious condition and failing to detect it is very high (Rothman, Martino, Bedell, Detweiler, & Salovey, 1999).

Framing effects have been demonstrated in a variety of contexts. Tversky & Kahneman (1981), for example, presented a medical problem where participants were asked to choose between two treatment options. In the gain-frame condition, they were told that if Program A were adopted 200 people will be saved, and if Program B were adopted there is a 1/3 chance that 600 people will be saved and a 2/3 chance that no people will be
saved. In the loss-frame condition, they were told that if Program C were adopted 400 people will die, and if Program D were adopted there is a 1/3 chance that nobody will dies and a 2/3 chance that 600 people will die. Although the terms of the problems are functionally identical, most people in the loss-frame condition will avoid the certain loss and opt for the gamble, and most people in the gain-frame condition will accept the certain gain and avoid the gamble (Tversky & Kahneman, 1981). Framing effects have been observed in adults in many other contexts, such as resource-distribution scenarios, and health behaviour promotion (McCusker & Carnevale, 1995; Rivers et al., 2005; Rothman et al., 1999). Thus, a second goal of the current study was to investigate whether children’s adherence to a new convention would be affected by the way the message was framed.

A few studies have examined framing effects in children. A recent study of health-promoting messages in kindergarten found that both gain- and loss-framed messages were more effective than a neutrally-framed message at promoting healthy foods, however there was no significant difference between the gain- and loss- conditions (Bannon & Schwartz, 2006). The framing difference was quite subtle however, and the researchers suggested that the children may not have understood the messages (Bannon & Schwartz, 2006). Another earlier study with elementary school children also did not find any framing effects in the younger children (Reyna & Ellis, 1994). A subsequent study with simplified methodology, however, found clear framing effects in 5- and 6-year-old children. In one condition they were offered the choice of either definitely giving up one prize or gambling on giving up all or none of the prizes, and in the other condition they were offered the choice of either definitely getting one prize or gambling on getting all or
none of the prizes. Both the older and the younger children were far more likely to select the gamble in the certain-loss condition than in the certain-gain condition (Levin & Hart, 2003).

Another study with 6- and 9-year-olds used a similar paradigm, where the children had to help a puppet share jellybeans, either certainly giving up a few jellybeans or gambling on either giving up many jellybeans or no jellybeans. The pattern of performance for the children was similar to that of adults in other studies - when the choice was presented in a gain-frame (how many jellybeans the puppet would “save”), children selected the certain loss on 80% of the trials (Schlottmann & Tring, 2005). When the same choice, however, was presented in the loss-frame (how many jellybeans the puppet would “lose”) they selected the certain loss on only 22% of the trials (Schlottmann & Tring, 2005). Young children, then demonstrate the same irrational framing bias as adults – they are more behaviourally motivated if the problem is presented in a loss-frame rather than in a gain-frame.

The consistency and breadth of these framing effects have interesting implications for the acquisition of conventional knowledge. The two ways in which information about conventionality could be provided map roughly on to the gain-frame/loss-frame constructs of Prospect Theory. Specifically, we can conceptualize the information that adherence to a convention leads to social acceptance as a gain-frame message, and information that non-adherence to a convention leads to social rejection as a loss-frame message. The question, then, is whether young children are sensitive to framing effects in their acquisition of conventional knowledge. If people are indeed motivated to maintain the status quo, it follows that children would be more motivated by the threat of social
exclusion, because this frame implies that the individual is already a part of the group, and that their continued inclusion is at stake. When this information is presented in a gain-frame, the implication is that the individual does not yet belong to the group, and that engaging in the conventional behaviour will lead to their acceptance, and the question becomes whether the individual really wants to belong to the group in the first place, rather than whether they are willing to risk expulsion.

The current study addresses whether 3- and 5-year-old children are sensitive to information that many people adhere to a novel style convention, and whether that information is sufficient to elicit that behaviour in the absence of negative consequences for transgressions. This study also addresses whether children are sensitive to how the information is framed. The children were offered the opportunity to play with a novel toy after a demonstrator gave them information about it’s use. The toy was operated with balls, and the children were presented with two colours of otherwise identical balls. In order to address whether children are able to discriminate information that an action is conventional versus idiosyncratic, there were two experimental conditions where the children were informed that a certain ball colour choice was shared by others, and two control conditions where they were informed that a certain ball colour choice was preferred by the demonstrator. Ball colour was selected as the style convention, because it satisfies the condition that it could not reasonably be interpreted as having a functional purpose beyond simply being what everybody else uses. To address whether children are sensitive to information framing, one experimental and one control condition presented
the information in a positive frame, and the other conditions presented the information in a negative frame.
Chapter 2: Method

Participants

Participants were recruited from a database comprised of families recruited from local community events and birth announcements. The final sample consisted of forty-eight 3-year olds (24 females, \(M=40\) months; 24 males, \(M=39\) months) and forty-eight 5-year-olds (24 females, \(M=63\) months; 24 males, \(M=64\) months). Twelve children from each age group (6 male and 6 female) were tested in each of the four conditions. Twelve other children were tested but not included in the analysis; 5 were excluded for failing the control question, 3 were excluded due to experimenter error, 2 were excluded because they did not speak English, 1 child refused to participate, and 1 was excluded due to insufficient data (refused to participate on second and third trial). The sample was drawn from a community in a small Canadian city, and was composed primarily of Caucasian, middle class families.

Materials

Children were tested on a novel apparatus consisting of a clear plastic hamster cage, with multiple open-ended tubes protruding from it in different places (see Figure 1). The tubes were made of coloured translucent plastic, and each was a different shape.

Three small light-up LED fans were mounted on the top of the apparatus, and each tube was wired with an optic sensor that triggered the fans to light up and spin for 1 second when a ball passed through the tube. Along with the apparatus were two baskets of painted wooden balls small enough to fit in the tubes – one basket was for the experimenter and the other basket was for the child. Each basket contained 16 yellow
balls and 16 orange balls. Prior to the testing phase, the apparatus was placed on a child-sized table, with each of the tubes equally accessible to the participants.

![Figure 1. Novel apparatus](image)

**Procedure**

The experimenter first engaged the child in casual play in the waiting area. Once the child was comfortable, they were brought into a small testing room with a child-sized table and invited to sit at the table with the experimenter. The testing apparatus and baskets of balls were on the floor behind the experimenter’s chair to reduce the likelihood of distraction.

Prior to the main testing phase, participants were given a vocabulary test to determine whether they understood the terms ‘everybody’ and ‘nobody’. In the ‘everybody’ vocabulary test, the child was shown a picture of four cartoon children in a house and the experimenter said:
“You see these kids? They all live together in this house. And in this house everybody listens to music. Everybody listens to music in this house!”

The experimenter then pointed to each child in the picture saying “Does he/she listen to music?”. If the child incorrectly indicated that one of the children did not listen to music, they were given the following prompt: “Well let’s think about that! If everybody listens to music, that means that all of the children listen to music!” and the experimenter again pointed to each child in the picture and asked if they listened to music. If the child answered incorrectly a second time, the experimenter moved on to the second vocabulary test. The child was given a score of 0 if they answered incorrectly that one or more of the children did not listen to music, and a score of 1 if they correctly answered that each of the children listened to music.

The children were then shown a different picture of four different cartoon children in a different house. The procedure for the ‘nobody’ vocabulary test was identical, except that the experimenter began the script with: “This is a different house! And in this house, nobody listens to music! Nobody listens to music in this house!” The child was given a score of 0 if they answered incorrectly that one or more of the children did listen to music, and a score of 1 if they correctly answered that each of the children did not listen to music. The order of presentation of the vocabulary tasks was counterbalanced to control for perseverative responses.

In the main testing phase, the experimenter placed the apparatus on the table saying: “Check out this cool toy! You put a ball into it, and it lights up!” The experimenter then made one of four statements about the conventional ball colour or the experimenters preferred ball colour, depending on the condition, and asked a
corresponding control question (see Table 1). The differently-framed statements in the conditions were matched for grammar, with the exception of the inclusion of the word ‘only’ in the inclusion frames. The word ‘only’ was included to match for overall semantic content of the statements; in the exclusion frame, the statement of what colour is excluded clearly delineates that only the other colour is acceptable, however simply stating what colour is included in the inclusion frame would not necessarily signify that the other colour is not acceptable, therefore we used the term ‘only’ to clearly indicate that the alternate colour is not acceptable. The initial statement was reiterated and the control question asked again up to three times if the child did not answer correctly the first time. The target colour (ie. the stated preferred or conventional colour for that testing session) was counterbalanced to control for potential colour preference confounds.

Table 1. Statements Used in Each Condition

<table>
<thead>
<tr>
<th></th>
<th>Experimental conditions</th>
<th>Control conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Convention</td>
<td>Preference</td>
</tr>
<tr>
<td>Initial Statement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Question</td>
<td>“So what colour does everybody only use?”</td>
<td>“So what colour does nobody use?”</td>
</tr>
</tbody>
</table>

After the child correctly answered the control question, they were presented with a basket of balls, and the experimenter said: “Let’s play a game! You put in three, and then I’ll put in three!” There were three trials in total. On the first trial, the child was encouraged to take the first turn then the child and experimenter took turns putting in balls from their respective baskets. The experimenter used only target colour balls. Once the
experimenter had used 15 balls, she said “Let’s clean up and try again!” and removed all of the balls from the apparatus, replacing the balls in their respective baskets so that both experimenter and child once again had 16 of each colour of balls. The second trial proceeded in the same manner, except that the experimenter stopped the play and reset the game after she had used 12 balls. The third trial was the same, except that the experimenter stopped the play after she had used 15 balls, and said “I’m done with that game!”. The session was then terminated. As the child was not prevented from using more or fewer than three balls on a given turn, so as not to interfere with their natural pattern of ball colour selection, the total number of balls used sometimes varied from trial to trial.

If the child asked directly if they were permitted to use a certain colour (target or non-target), the experimenter re-iterated the initial statement. If the child asked more than three times the experimenter replied “You get to choose”. If the child asked ‘why?’ in response to the initial statement of preference/convention, the experimenter re-iterated the initial statement. If the child asked more than three times the experimenter replied: “I don’t know – they/I just do”. If the child dropped a ball and failed to immediately retrieve it, the experimenter quickly handed the ball back to the child. If the child questioned the experimenter about their ball selection (ex. “This one?”), the experimenter did not reply. If the child questioned the experimenter about their ball selection more than three times, the experimenter replied “You get to choose.” The experimenter did not interfere with the child’s ball selections in any way, nor did they offer any verbal or non-verbal feedback on ball selections.
Ball selection coding.

Test sessions were coded from videotape by a single observer. Another independent observer coded 40% of all of the sessions for reliability. For each trial, the order of the child’s ball selections (target or non-target) as they were placed into the apparatus was recorded. A target ball selection was coded as 1, non-target ball selections were coded as 0.

There were several issues associated with the raw data generated by this coding scheme. It was not possible to use total number of targets selected as the dependent variable, because the participants were not prevented from using more or fewer balls on each turn, and as such the total number of balls used on any given trial could range from 1 to 36 balls. The total number of target selections could therefore be misleading, as the likelihood of selecting 9 target balls out of 18 by chance, for example, is not the same as the likelihood of selecting 9 target balls out of 10 by chance.

Neither was it practical to use the proportion of target selections in a given trial as the dependent variable. Because of the varying trial length, and the fact that the baseline probability of a target ball selection changed with each prior selection, the likelihood of selecting 3 target balls out of 4 by chance is different than the likelihood of selecting 9 target balls out of 12. Similarly, the likelihood of a child making 6 target selections in a row and then 6 non-target selections is different than a trial in which targets and non-targets are selected in alternating fashion. In short, it would be misleading to simply look at the overall proportion of target balls used, as this does not take into account the changing probability of selecting a given ball by chance.
Our goal, then, was to develop a dependent measure that addressed these issues. To do so, we took a two-step approach. First, we computed the probability of all target ball selections within a given trial. The more systematic children’s selections were within a trial, the lower the probabilities of making target selections. Thus, we took the lowest achieved probability for a given trial and used that as the basis of the dependent measure (see Figures 2 and 3 for examples)
### Sample trial data (example 1)

<table>
<thead>
<tr>
<th>Selection #</th>
<th>Target balls available</th>
<th>Total balls available</th>
<th>Selected Target?</th>
<th>Probability of selecting target ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>32</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>31</td>
<td>1</td>
<td>0.484</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>30</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>29</td>
<td>1</td>
<td>0.483</td>
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<tr>
<td>5</td>
<td>13</td>
<td>28</td>
<td>1</td>
<td>0.464</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>27</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>26</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>25</td>
<td>0</td>
<td>--</td>
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<tr>
<td>9</td>
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<td>24</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>23</td>
<td>0</td>
<td>--</td>
</tr>
</tbody>
</table>

Total number of ball selections: 10  
Proportion of target balls selected: 0.4  
Lowest achieved probability of selecting target ball: 0.464

### Sample trial data (example 2)

<table>
<thead>
<tr>
<th>Selection #</th>
<th>Target balls available</th>
<th>Total balls available</th>
<th>Selected Target?</th>
<th>Probability of selecting target ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>32</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
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<td>0</td>
<td>--</td>
</tr>
<tr>
<td>3</td>
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<td>--</td>
</tr>
<tr>
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<td>16</td>
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<td>1</td>
<td>0.552</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>28</td>
<td>0</td>
<td>--</td>
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<td>0</td>
<td>--</td>
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<tr>
<td>10</td>
<td>13</td>
<td>23</td>
<td>1</td>
<td>0.565</td>
</tr>
</tbody>
</table>

Total number of ball selections: 10  
Proportion of target balls selected: 0.4  
Lowest achieved probability of selecting target ball: 0.552

*Figure 2.* Example of two trials of same length and proportion of target balls with different lowest achieved probability of selecting target.

It was not possible to simply use lowest achieved probability of selecting a target as the dependent variable, however, because it does not take into account varying trial length; by chance, smaller probabilities can be expected in longer trials. To address this issue, we used a monte-carlo simulation to generate the chance distributions associated
with all trial lengths. Then, we computed the z-score associated with the lowest achieved probability (computed in step 1) from the mean and standard deviation of the relevant chance distribution. This z-score allowed us to compare data across different trial lengths and orders of selection for target ball selections.

<table>
<thead>
<tr>
<th>Selection #</th>
<th>Target balls available</th>
<th>Total balls available</th>
<th>Selected Target?</th>
<th>Probability of selecting target ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>32</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
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<tr>
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<td>1</td>
<td>0.467</td>
</tr>
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<td>13</td>
<td>29</td>
<td>0</td>
<td>--</td>
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<td>0</td>
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<td>24</td>
<td>0</td>
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</tr>
<tr>
<td>10</td>
<td>13</td>
<td>23</td>
<td>0</td>
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</tr>
</tbody>
</table>

Total number of ball selections: 10
Proportion of target balls selected: 0.3
Lowest achieved probability of selecting target ball: 0.467

<table>
<thead>
<tr>
<th>Selection #</th>
<th>Target balls available</th>
<th>Total balls available</th>
<th>Selected Target?</th>
<th>Probability of selecting target ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>32</td>
<td>1</td>
<td>0.5</td>
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<tr>
<td>2</td>
<td>15</td>
<td>31</td>
<td>1</td>
<td>0.484</td>
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<td>0.467</td>
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<tr>
<td>4</td>
<td>13</td>
<td>29</td>
<td>0</td>
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<tr>
<td>5</td>
<td>13</td>
<td>28</td>
<td>0</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>27</td>
<td>0</td>
<td>--</td>
</tr>
</tbody>
</table>

Total number of ball selections: 6
Proportion of target balls selected: 0.5
Lowest achieved probability of selecting target ball: 0.467

Figure 3. Example of two trials of different length and proportion of target balls with same lowest achieved probability of selecting target

Inspection of the distributions of this variable showed a slight negative skew, owing to the fact that as trial length increased, the mean of the chance distributions shifted below .5. For example, for a trial length of 16 balls, the mean lowest probability
of selecting a target ball is .4649, with a standard deviation of .0522. The mean of the
distribution is almost a full standard deviation below .5. This means that a lowest
probability of selecting a target score of .6 is associated with a z-score of approximately
+3, but a score of .4 is associated with a z-score of approximately -1, even though both
scores are the same distance from chance. In practical terms, this z-score overestimates
the z-scores for children systematically selecting non-target balls, and underestimates the
z-scores for children systematically selecting target balls.

In order to correct for this bias, the process was mirrored to compute the z-scores
corresponding to the lowest probability of selecting non-target balls, whose chance
distributions became increasingly positively skewed as trial length increased. In order to
calculate a more accurate dependent variable that took into account systematic selection
of both target and non-target balls, the z-score for lowest probability of selecting a target
ball was reverse coded, and the average of the two z-scores was calculated (see Figure 4
for example). This averaged z-score was used as the dependent variable.

\[
\text{z-score associated with lowest probability of selecting target ball} = -3 \\
\text{z-score associated with lowest probability of selecting non-target ball} = 4 \\
\text{Average z-score} = \frac{z\text{-score [target]} + (z\text{-score [non-target]} \times -1)}{2} = \frac{-3 + (-4 \times -1)}{2} = -3.5
\]

*Figure 4.* Example of calculation of average z-score.
Chapter 3: Results

Preliminary analyses showed that performance on the relevant vocabulary measure was not related to systematic target selection, supporting that non-systematic selection was not because the child did not understand the relevant vocabulary. There was also no significant effect of age on vocabulary test performance. For this reason, the vocabulary measure was not included in subsequent analyses. Preliminary analyses also showed that there were no main effects of trial, nor did trial interact with the main independent variables of interest (i.e., age, condition, or frame). Furthermore, reliability analyses showed that there was a remarkable degree of scale reliability among the three trials (alpha = .914). For these reasons, we elected to average performance across the three trials, and the average z-score of the three trials was used as the dependent variable in the analysis.

The average z-scores were submitted to a 2 (age: 3 years, 5 years) X 2 (condition: preference, convention) X 2 (frame: inclusion, exclusion) ANOVA. The means for performance in each cell are illustrated in Figure 5. There was a significant main effect of age on target ball selection, $F(1, 88) = 7.053, p = .009$. On average, the 3-year-olds were more likely to use target balls ($M = -1.580, SD = 1.131$), than were the 5-year-olds ($M = -0.006, SD = 2.994$), indicating that the 3-year-olds were more likely to comply with the stated convention or preference than were the 5-year-olds. To test whether 3- and 5-year-olds’ selection of target balls was systematic, we conducted one-sample t-tests against the chance mean ($\mu = 0$). These tests indicated that the 3-year-olds systematically selected target balls, $t(47) = 3.496, p = .001$, but 5-year-olds did not, $t(47) = .013, p = .990$. 

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The omnibus ANOVA also revealed a significant main effect of condition on target ball selection, $F(1, 88) = 5.206, p = .025$. Children were more likely to select target balls in the convention condition ($M = -1.469, SD = 3.145$) than in the preference condition ($M = -.116, SD = 3.034$). As above, single sample t-tests were conducted to test whether performance in each condition was systematic. Results showed that target ball selection was systematic in the convention condition, $t(47) = 3.236, p = .002$, but not in the preference condition, $t(47) = .266, p = .791$.

In the ANOVA, the main effect of frame did not reach the standard criterion for statistical significance, $F(1, 88) = 3.195, p = .077$. However, the mean differences were in the predicted directions, with children tending to select more target balls when conventions or preferences were stated in the exclusion frame ($M = -1.323, SD = 2.961$) as opposed to the inclusion frame ($M = -.263, SD = 3.270$). Single sample t-tests were conducted to test for systematic ball selection in each frame. Results indicated that target

![Figure 5. Mean z-scores for each age group by condition and frame.](image)
ball selection was systematic in the exclusion frame $t(47) = -3.095, p = .003$, but not in the inclusion frame, $t(47) = - .557, p = .580$.

Finally, the ANOVA showed a near-significant condition X frame interaction, $F(1, 88) = 3.243, p = .075$. The means and standard errors for the cells in this interaction are presented in Figure 6.

![Figure 6. Mean z-scores for each frame by condition, collapsed across age group. (*) indicates significantly different from chance $p < .05$](image)

Follow-up tests showed that the near-significant interaction was attributable to the fact that while frame had no detectable influence on ball choice in the convention condition, $t(46) = -.009, p = .993$, there was a significant difference between frames in the preference condition, $t(46) = 2.569, p = .014$. Specifically, in the preference condition, only children in the exclusion frame used target balls; children in the inclusion frame actually had a positive mean z-score thereby suggesting a tendency to prefer non-target balls. However, one-sample t-tests against chance showed that children in the
preference-inclusion case were not significantly different from chance in their ball selection. In contrast, children in all of the other conditions were systematic in their selection of target balls.

One of our most interesting predictions was that the effects of conventionality condition might be stronger for 5-year-olds relative to 3-year-olds. The failure of the omnibus ANOVA to find a significant age x condition interaction would suggest that the condition effect was similar for both age groups. However, inspection of the means suggested that the convention effect was substantially different across the age groups, though the difference was opposite to what we predicted (see Figure 7.) Specifically, 3-year-olds were more likely to select target balls in the convention condition relative to the preference condition, $t(46) = 2.626, p = .012$, but five-year-olds were not, $t(46) = .537, p = .594$.

![Figure 7](image_url)

*Figure 7. Mean z-scores for each age group by condition, collapsed across frame. (*) indicates significantly different than chance $p < .05$*
The foregoing analyses tested mean differences in z-scores across the conditions, which is arguably the most sensitive way to test children’s tendencies as a group to select target balls by condition. The z-score measure also gives us a way of categorizing children in terms of whether they did or did not follow the convention. Specifically, we can assume that children who were outliers in the chance distribution (z < -2.5) were systematically selecting target balls on an individual basis. Thus, for each child, we coded the number of trials on which they obtained a z-score of at least -2.5, and summed them to get an overall picture of each child’s tendencies to systematically select target balls in a given trial. Because there were three trials, scores on this DV ranged from 0 to 3.

A 2 (age: 3 years, 5 years) X 2 (condition: preference, convention) X 2 (frame: inclusion, exclusion) ANOVA on the systematic selection DV yielded no main effects. There was, however, a very strong age X condition interaction, \( F(1, 88) = 11.248, p = .001 \). Follow-up t-test analyses showed that three-year-olds selected systematically on more trials in the convention condition (\( M = 1.167, SD = 1.404 \)) than in the preference condition (\( M = .167, SD = .637 \), \( t(46) = 3.178, p = .003 \). In contrast, for the 5-year-olds, the mean number of systematic selection trials in the preference condition (\( M = .583, SD = 1.018 \)) was comparable with the convention condition (\( M = .208, SD = .721 \), \( t(46) = 1.473, p = .148 \). These findings confirm a finding that was hinted at in the z-score analyses – namely that 3-year-olds were more likely to show a difference between the convention and preference conditions than were 5-year-olds.

A final question that can be addressed from the systematic selection DV concerns how many children per condition showed systematic selection on at least one of the trials. These data are summarized in Table 2. Logistic regression analysis essentially
recapitulated the findings from the systematic selection ANOVA. Specifically, there were no main effects but there was a strong age group by condition interaction, Wald $\chi^2(1) = 9.499, p = .002$. Examinations of the simple chi-square analyses showed that for three year olds, children were more likely to show systematic selection in the convention condition than in the preference condition, $\chi^2(1) = 8.545, p = .002$. Five-year-olds, in contrast, showed a near significant tendency to show systematic target selection in the preference case, $\chi^2(1) = 3.419, p = .064$. These findings are essentially consistent with the previous analyses in showing that 3-year-olds consistently showed the predicted effect of conventionality condition, though the pattern of performance for 5-year-olds is less consistent across analyses.

Table 2. Number of participants who systematically selected target balls on at least one trial

<table>
<thead>
<tr>
<th></th>
<th>3 years inclusion</th>
<th>3 years exclusion</th>
<th>5 years inclusion</th>
<th>5 years exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>convention</td>
<td>5 / 12</td>
<td>6 / 12</td>
<td>1 / 12</td>
<td>1 / 12</td>
</tr>
<tr>
<td>preference</td>
<td>1 / 12</td>
<td>1 / 12</td>
<td>2 / 12</td>
<td>5 / 12</td>
</tr>
</tbody>
</table>
Chapter 4: Discussion

Convention vs. Preference

The successful acquisition and application of style conventions is essential in order to fit in with any culture or social group. Nevertheless, there have been few attempts to study when children might become sensitive to style conventions. Instead, research, has tended to focus on conventional forms such as language (eg. Sabbagh & Henderson, 2007), tool use (eg. Defeyter & German, 2003), and game rules (eg. Rakoczy et al., 2008) — conventions that have some obvious practical function. The fact that there is also a practical reason to follow these conventions means that it is difficult to infer whether children are following them for practical reasons or social reasons. Through the current study of style conventions, we attempted to address whether children are sensitive to the social inclusion function of conventions independently of their obvious pragmatic function.

Overall, children were much more likely to use the target colour of balls in the convention condition than in the preference condition, indicating that the information that a given style of play was shared is indeed sufficient to elicit compliance. However, there were clear indications that the main effect of condition interacted with age. Specifically, 3-year-olds were much more likely use target balls in the convention than in the preference condition, but the 5-year-olds were equally likely to use target balls in both conditions, and in both conditions performed at chance levels. Three-year-olds performed at chance levels only in the preference condition. What is interesting about this age effect is that it was in the opposite direction to that which we had predicted.
Given the extensive body of literature suggesting that children become less tolerant of conventional transgressions as they get older (Smetana, 1981; Smetana, 1985; Yau & Smetana, 2003), the fact that the 3-year-olds, but not the 5-year-olds, evidenced sensitivity to information about conventions when playing the game themselves was surprising. One possible explanation for this finding is that the younger children mistakenly interpreted the colour of the balls as having functional significance. There is, in fact, some evidence that preschoolers will imitate non-functional modeled actions because they encode those actions as having causal significance (Lyons, Young, & Keil, 2007). In one study, after watching an adult model opening a puzzle box using a series of functional and obviously irrelevant actions, preschool children imitated the entire sequence of actions. Moreover, when one of the irrelevant actions was executed in an inefficient manner (using a handle near the axis of a cage to rotate it, for example) children tended to imitate the action in a different style (using a handle on the periphery of the cage to rotate it, for example) (Lyons et al., 2007). This strongly suggests that young children interpret irrelevant actions as having functional significance. This observation coincides with evidence that 3-year-olds may not perceive that conventions are arbitrary (Kalish, 1998), instead inferring some kind of natural derivation. Thus, in the case of the present study, the 3-year-olds may have thought that the target colour balls actually worked better. One limitation of the current study was that, in order to distinguish the convention and preference conditions, the experimenter explicitly stated that her colour choice in the preference condition was due to a like or dislike of a certain colour, effectively providing an explanation for the colour choice. As no such explicitly
non-functional explanation was implied in the convention statement, we cannot rule out the possibility that the 3-year-olds attributed functional significance to the ball colour.

While clearly a possibility, however, there are a couple of reasons to think it unlikely that the 3-year-olds attributed functional significance to the ball colour. First, the experimental script explicitly made a reference to the possibility of using non-target balls, which should have served to mark them as viable options. Second, the majority of the three-year-olds in the convention condition used mostly - but not exclusively - target balls. This means that they must have directly experienced the efficacy of the non-target balls in activating the toy, and yet still elected to use mainly target balls. It is not clear then, that perceived functional significance of the target colour alone could account for the condition difference that we observed within the 3-year-olds.

Similar arguments can be marshaled against the possibility that the 3-year-olds used target balls more often than 5-year-olds because the 3-year-olds were more motivated to gain experimenter approval. This motivation would lead to the expectation of high compliance in the preference condition, but 3-year-olds did not show that. Three-year-olds, but not 5-year-olds, used information about the shared and normative nature of the experimenter’s ball selection and modified their selection accordingly.

Perhaps the more surprising finding of this study was that the 5-year-olds did not adhere to the style convention. There are two possible explanations for why 5-year-olds did not adhere to the convention. The first possibility is that they were not sensitive to the information that a behavioural style that is shared is conventional. This seems unlikely, as there is considerable evidence that children apprehend the shared nature of other types of conventions well before the age of five (Casler & Kelemen, 2005; Defeyter & German,
2003; Henderson & Graham, 2005; Koenig & Echols, 2003b; Rakoczy, 2007). It is
doubtful that 5-year-olds recognize the shared nature of other types of conventions, but
do not recognize the shared nature of style conventions, whose intrinsic purpose lies in
their being shared. Furthermore, 5-year-olds seem to recognize that other types of
conventions are arbitrary (Kalish, 1998), and therefore are likely to at least consider the
possibility that style conventions are arbitrary. The style convention in this study
concerned colour, a property that 5-year-olds may well be sophisticated enough to
identify as completely arbitrary, and thus non-functional. The arbitrary nature of this
convention may have been more salient to their decision of what colour balls to use than
the information that the behaviour was shared.

An alternative, more plausible explanation is that the 5-year-olds recognized that
the behaviour was conventional, and simply chose not to follow the convention. There
are several explanations for why 5-year-olds might have opted not to comply with the
conventional norm. One is that there were no tangible consequences when they used the
non-target balls, so they may not have seen any advantage in following the style
convention, or, perhaps more importantly, they may not have seen any disadvantage in
not following it. Five-year-olds might follow conventions because of the practical
benefits they derive, and not just because of some intrinsic sense of social propriety. It is
possible that, in the case of 5-year-olds, the knowledge that an arbitrary behaviour is
shared is not in and of itself sufficient to elicit that behaviour, in the absence of
consequences for transgressions.

Relatedly, because there were no consequences to non-adherence, 5-year-olds
may have believed that the convention was not very important. In any group or culture,
some style conventions are considered more important to follow than others – it is less acceptable, for example, to wear a bathing suit to a formal banquet than it would be to use a salad fork to eat the entrée. Five-year-olds may choose not follow a particular style convention if they perceive adherence to be less important to the social group. In this study paradigm there was no response of any kind from the investigator when a child used a non-target ball. The 5-year-olds might have interpreted the lack of negative feedback as evidence that the convention was not very important and thus less serious to violate. Research on conventional tool use confirms that 5-year-olds might be flexible in their interpretation of the importance of conventions, as 5-year-olds, but not 7-year-olds, can easily think of non-conventional uses for common items (Defeyter & German, 2003).

The fact that 5-year-olds are comfortable suggesting non-conventional uses for common objects indicates that they believe that it is sometimes acceptable to violate certain conventions.

Third, it may be that the 5-year-olds’ failure to comply was an act of outright defiance. It is worth noting that six of the 5-year-olds in the convention condition who did not exclusively use target balls actually declared their intention to use non-target balls immediately following the statement outlining the style convention, but only one 5-year-old declared their intention to use non-target balls in the preference condition. Although the reasons underlying the 5-year-olds failure to comply remain opaque, 5-year-olds did not modify their behaviour based on information that an action was shared and normative.

Another finding of this study was that, for the systematic selection dependent variable, 5-year-olds were actually slightly more likely to select target balls in the
preference condition than in the convention condition. It is unclear what is driving this trend in the 5-year-olds. Perhaps they felt more social pressure from the immediacy of the experimenter’s preference than from the indistinct masses that shaped the style convention.

Overall, the finding that 3-year-olds will follow an arbitrary style convention solely because they have evidence that it is shared and normative has several interesting implications. First, these findings suggest that children are sensitive to style conventions early in development, in the same way that they are sensitive to more functional conventions like language and tool use. Although we cannot rule out the possibility that the 3-year-olds in this study attributed some functional significance to the ball colour, the alternative possibility is that young children might motivated by the purely social impetus to be like other members of their group. Second, these results strengthen the argument that children are driven by to acquire conventions because they are normative, rather than because they occur with statistical regularity. The 3-year-olds in this study adhered to a new style convention exclusively because they were informed that it was shared, without needing repeated exposure to examples of the convention. Although it is unclear why the 5-year-olds in this study chose not to adhere to the style convention, at the very least we can say that by the age of three children are sensitive to style conventions, and motivated to adhere to them.

Framing Effects

Contrary to our predictions, there was no consistent main effect of frame. There was, however, an intriguing frame by condition interaction. Both frames were equally effective in promoting systematic target ball selection the convention condition. In the
preference condition, however, the exclusion frame resulted in more systematic target ball selection. There was also a slight trend toward more non-target ball selection in the inclusion frame, although selection in this case did not differ from chance. The question, then, is why there was a framing effect in the preference condition, but not in the convention condition.

With respect to the tendency to use target balls in the exclusion frame, one intriguing possibility is that the children interpreted the experimenter’s expressed dislike for a certain ball colour as evidence that there was something inherently objectionable about those balls; there is evidence that preschoolers’ dislikes are often the result of an unpleasant or frightening experience (Miller, 2001). It is possible, then, that the children avoided the colour of balls that the experimenter said she disliked because they assumed that those balls were aversive in some way.

When the experimenter expressed framed her preference in terms of an explicit partiality to the target balls, the children tended to use non-target balls. No solid conclusions can be drawn from this finding, as this trend was not statistically different than chance, however it does raise some interesting possibilities. One possibility is that 5-year-olds interpreted this experimental paradigm as a game. In game play, as in this paradigm, there is often turn taking. Furthermore, colour is often used to distinguish players in games – in checkers, for example. The 5-year-olds might have interpreted the experimenter’s declaration of their preferred colour as a sign that the experimenter wished to be represented by that colour in the game. Informal anecdotal evidence in support of this notion comes from the fact that a few of the children in the study actually suggested swapping all of their target balls for all of the experimenter’s non-target balls.
In this case, it is possible that the children were trying to be ‘nice’ by offering the experimenter her favoured colour. Research indicates that prosocial behaviour in preschool children, including sharing, is often overtly encouraged by adults (Eisenberg, Wolchik, Goldberg, & Engel, 1992). Similarly, another study found that preschool children often spontaneously came up with sharing as a type of ‘nice’ behaviour (Tisak, Holub, & Tisak, 2007). In the absence of a strong personal preference, the children may have allowed the experimenter to be represented in the game by their preferred colour. More research is required to investigate this possibility.

Interestingly, there were no framing effects in the convention condition: children were equally likely to select target balls in the exclusion and inclusion frames. The reason for this is unclear, although there are several possibilities. It may be that message frame simply does not affect behaviours with exclusively social consequences. All previous research on message framing has been concerned with behaviours that have tangible outcomes, such as prizes or health benefits (Reyna & Ellis, 1994; Rothman et al., 1999). In the current study, the potential outcomes were both implicit and social – the promise of social inclusion, or the threat of social exclusion. Potentially, implicit social consequences are not prone to framing effects. In that case, however, it would be difficult to account for the framing effects in the preference condition, where the outcomes are also social, and arguably more abstract.

An important, related concern is that all previous research on framing has used message frames with explicitly delineated consequences. In the current study, the possible outcomes were implied, in that the benefits of conformity (that the child would be socially accepted) or the drawbacks of non-conformity (that the child would be
socially rejected) were not explicitly outlined. In this case, the framing difference may have been too subtle. More research on framing effects in the social domain is necessary to make sense of these results.

*Future directions*

The current study demonstrated that by the age of 3, children would adhere to a new style convention based exclusively on the information that it is shared. Five-year-olds, however, did not adhere to the new style convention. An important question is why 3-year-olds, but not 5-year-olds, adhered to the style convention. There are three possible explanations for this difference. First, although unlikely, it is possible that 3-year-olds mistakenly attribute some functional value to the style convention, and 5-year-olds do not. To address this possibility, the current paradigm could be modified to include an interview where the child is questioned about whether both colours of balls would work equally well in the toy, and why. A second possibility is that 5-year-olds perceived the style convention to be socially unimportant. In this case, the current paradigm could be modified to include a reminder, where the experimenter responds to the first conventional transgression with a reiteration of the convention. This will, in theory, emphasize the importance of the convention, and thereby perhaps lead to more conformity in the 5-year-olds.

Another finding of this study was that there were no framing effects in the convention condition. An important question is whether framing effects can be elicited in the social domain, and under what conditions. One means by which this question might be addressed would be to make the consequences in the frames more tangible (eg. “if you use the orange balls, nobody will want to play with you” vs. “if you use the yellow balls,
everyone will want to play with you"). In the current study, the frames may have been too subtle, as the consequences for compliance and non-compliance were implicit.

In summary, 3-year-olds, but not 5-year-olds adhered to a new style convention in a simple game when given information that the style was shared and normative. More research is needed to better understand why the younger children, but not the older children, chose to adopt the experimenter’s style. Nonetheless, these findings show that even young preschoolers shape the extent to which they adopt others’ actions by considering whether those actions are shared.
References


