

Preschoolers' Understanding of Preferences is Modulated by Linguistic Framing

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Abstract

Reasoning about others' preferences is an important aspect of understanding the social world. Although there is some evidence that young children reason appropriately about others' discrepant preferences, there are reasons to suspect this ability remains fragile through the preschool years. In particular, we argue that the way preferences are expressed may tap into humans' lifelong tendency toward naïve realism, the belief that my way of seeing the world is the normative, correct one. We present data demonstrating that tolerance for unconventional opinions increases during the preschool years but remains susceptible to influence by linguistic framing.

Keywords: theory of mind; preferences; naïve realism; linguistic framing effects.

Introduction

Statements of preference are a profoundly strange phenomenon. In principle, preferences are subjective: although finding ice cream delicious may be normative and all but universal, "ice cream is delicious" is not true or false in the way that "ice cream is sugary" is true or "ice cream is hot" is false. Yet statements of this form--describing a subjective valuation as if it were an objective fact--are widespread and remarkably unremarkable. Could talking about preferences as if they were facts influence the way people reason about preferences? We suggest that preferences are a difficult concept to reason about (and particularly susceptible to effects of framing) because they hold a fundamentally different epistemic status from facts. They require acknowledging that one's own (often strongly held) beliefs are not verifiably correct, and that even totally opposite beliefs should be respected as valid. These recognitions require sophisticated perspective taking skills, which preschoolers notoriously lack. However, adults also show similar biases, as the literature on naïve realism demonstrates (Robinson, Keltner, Ward, & Ross, 1995). These observations lead us to ask: how do children reason about preferences that differ from their own? Does the way we talk about preferences impact their reasoning?

It is well documented that preschoolers begin passing classic tests of false-belief understanding around age four (see Wellman, Cross, & Watson, 2001, for a meta-analysis). A prominent explanation of this shift is that children develop the insight that the mind operates on representations of the world, rather than veridical copies of the world. In other words, for a pre-representational child, mental states are taken as exactly reflecting the state of the world. One

consequence of a non-representational theory of mind could be that a child's evaluative opinions (such as whether she finds ice cream delicious or not) are also taken as direct reflections of objective properties of the world. Such a belief should lead pre-representational children to expect everyone else also to find ice cream delicious, and the subjective, idiosyncratic nature of preferences to be lost.

Some evidence does exist that very young children in fact treat subjective properties like "deliciousness" as features of objects rather than as mental states tied to individuals. Gergely, Egyed, & Király (2007) report that 14-month-olds expect adults to treat an object in accordance with the total amount of liking or disliking for the object the infant has witnessed, irrespective of whether a particular adult has previously demonstrated liking or disliking for the object. In other words, infants do not reason about an object's likability in terms of a particular person's opinion about that object. Instead, they seem to aggregate information across individuals and associate that totality with the object, not with the individuals who produce the information. This finding is consistent with a relatively impoverished understanding of mental states, whereby children conceptualize beliefs (including those about an item's likability or desirability) as reflecting objective states in the world.

At the same time, the strongest version of this hypothesis is not borne out in the data: at least in some cases, slightly older children respond appropriately to desires different from their own. Children as young as 18 months recognize that adults may desire different foods than they themselves do: when an adult who has previously shown positive affect towards broccoli and negative affect toward goldfish crackers requests more food, 18-month-olds (but not 14-month-olds) respond appropriately to requests for food (Repacholi & Gopnik, 1997). In some contexts, two-year-olds also show similar understanding of others' desires (Ma & Xu, 2011). For example, children predict that a character will be happy when she satisfies her desire to play with a given toy, even when the participant has previously said she would choose to play with a different toy over that toy (Wellman & Woolley, 1991).

Given these discrepant findings, important work remains in charting out how children develop an adult-like understanding of preferences. In this paper, we present two studies in which we specifically probe how preschoolers reason about unconventional preferences--preferences that, while likely not espoused by the child, nonetheless are not

simply false or mistaken in the way that facts can be. We argue that achieving this understanding is an on-going process through the preschool years. Our evidence suggests that preschoolers' understanding of the subjective nature of preferences is fragile and easily disrupted.

Study 1

Participants

68 preschoolers from Bing Nursery School at Stanford University participated. Twenty-three 3-to-5-year-old children (12 boys) participated in a marked framing condition. The mean age was 4 years 6 months. Forty-five 3-to-5-year-old children (21 boys) participated in an unmarked framing condition. The mean age was 4 years 5 months.

Procedure

To evaluate how children understand unconventional preferences, we developed a paradigm in which participants were shown pictures of other children who were said to have answered questions about familiar foods. Questions either concerned factual properties, such as a food's color or texture, or subjective qualities, such as how appealing the food is. All foods used for opinion questions were chosen to be conventionally popular, desirable foods. Characters' responses to opinion questions were either conventional or unconventional (i.e., expressed a positive or negative attitude towards a popular food). Responses to factual questions were either true or false. This permitted us to analyze how children treated conventional and unconventional responses to opinion questions and to compare their treatment of opinion questions with their treatment of factual questions. Each child heard responses to two examples of each of the four statement types (true and false facts, conventional and unconventional opinions) for a total of eight items.

To examine how framing might influence performance, we manipulated how characters responded to opinion questions. In an *unmarked* framing condition, responses took the form "Ice cream is delicious" or "Ice cream is yucky." In a *marked* framing condition, responses took the form "I like ice cream" or "I don't like ice cream." We expected children to be more likely to reject an unconventional opinion when it was unmarked than when it was marked as an opinion with "I like."

To assess children's reactions to characters' statements, we directed four questions to participants after each question and statement pair. First, children were asked to explain why the character had made that statement (e.g., "Why did Martin say ice cream is delicious?"). Next, children were asked if the character made a mistake and if the character was "just being silly." (These two questions were designed to cover two of the most frequent categories of explanations that adults gave in pilot work.) Finally, children were shown a picture of another character who was said to hold the opposite belief of the first character (i.e., to hold a negative attitude when the first character held a

Statement Type	EXAMPLE STATEMENTS	
	Marked Condition	Unmarked Condition
True Fact	Milk is white.	Milk is white.
False Fact	Milk is green.	Milk is green.
Conventional Opinion	I like ice cream.	Ice cream is delicious.
Unconventional Opinion	I don't like ice cream.	Ice cream is yucky.

Figure 1: Summary of experimental design.

positive attitude or to hold a false belief when the first character expressed a true belief, and vice versa). They were then asked if that contrasting statement "could be right." We thus had three converging yes/no measures of whether children deemed a statement acceptable or mistaken, as well as an open-ended explanation of the characters' beliefs. Although we are primarily interested in children's judgments about opinion statements, including factual questions allowed us a baseline estimate of how often children would label as mistaken statements that adults would also describe as mistakes, against which we could compare children's treatments of opinion statements.

Results: yes/no questions

For the three yes/no questions, we scored each response as correct or incorrect as follows. True facts should be judged as not a mistake and not silly; when the second character expressed the opposite belief (i.e., a false fact), his response should be judged as not right. False facts should be judged as a mistake and as silly; when the second character expressed the opposite belief (i.e., a true fact), his response should be judged as right. Conventional and unconventional opinions, on the other hand, should be judged the same way as each other: as neither a mistake nor silly. When the second character expressed the opposite opinion (whether conventional or unconventional), their response should be judged as right. To test for possible developmental changes, we divided children into older and younger groups based on the median age for each condition.

As a first analysis, we conducted a logit mixed model using statement type, framing, and age (older or younger) to predict correct responding. We found a significant three-way interaction between statement type, framing, and median age, $b=-3.4$, $S.E.=1.5$, $z=-2.1$, $p=.04$. To unpack this three-way interaction, we next analyzed each statement type separately, examining effects of framing and age on children's performance.

True factual statements We first asked how children treated true factual statements (e.g., “Milk is white”). A logit mixed model using framing condition and age group to predict correct responding to questions about true factual statements showed a significant developmental difference ($b=2.4$, $z=2.4$, $p=.01$). The effect of framing was non-significant, as expected, since the factual statements were the same across framing conditions. This confirms that children did not differ in their baseline responses to identical statements of true facts across conditions.

To examine performance in a more fine-grained fashion, we created composite scores for each participant by summing the number of correct responses to all yes/no questions for each statement type (e.g., true fact, conventional opinion). The maximum possible score was 6 (three questions per two items for each statement type). In the marked framing condition, both older and younger children appropriately answered questions about true facts at well above chance rates (older: $M=5.5$ out of 6, $SD=.52$, $t(10)=16.2$, $p<.001$; younger: $M=4.3$, $SD=1.8$, $t(11)=2.5$, $p=.03$). However, as the logit model indicated, older children performed significantly better, $t(12.9)=2.2$, $p=.05$. In the unmarked framing condition, similar patterns emerged, with both older ($M=5.4$, $SD=1.4$) and younger children ($M=4.3$, $SD=1.8$) performing above chance rates, $t(21)=8.1$, $p<.001$ and $t(22)=3.4$, $p=.003$ respectively. As in the marked framing condition, older children somewhat out-performed younger children, $t(41.1)=2.3$, $p=.03$. Thus preschoolers seem to appropriately answer questions about true facts, judging that they are not mistakes at well above chance rates.

False factual statements We then asked how children treated false factual statements (e.g., “Milk is green”). A logit mixed model using framing condition and age group to predict correct responding to these questions showed neither the main effect of age or of framing, nor their interaction, reached significance. The non-significance of the effect of framing was, again, expected, since factual statements were identical across conditions.

On the composite measures, performance was strong for all groups. Questions about false facts were answered appropriately by older children in the marked framing condition at a rate significantly above chance ($M=5.2$ out of 6, $SD=1.08$, $t(10)=6.7$, $p<.001$). Likewise, younger children also answered appropriately at a rate that exceeded chance ($M=4.8$ out of 6, $SD=1.14$), $t(11)=5.32$, $p<.001$. Their overall performance was comparable to that seen for the older children, $t(21.0)=-.93$, n.s.

In the unmarked framing condition, younger children answered an average of 5.2 questions correctly ($SD=1.0$), which exceeded the number expected by chance, $t(22)=10.2$, $p<.001$. Similarly, older children answered an average of 5.3 questions correctly ($SD=.98$), again more than expected by chance, $t(21)=10.8$, $p<.001$. Older children’s performance was not significantly better than younger children’s, $t(43.0)=.18$, n.s. It is not clear why older children would out-perform younger children when questions were asked about true facts but not about false facts. Anecdotally, we have observed that some children are perplexed about the

pragmatics of asking whether a manifestly true fact (like milk being white) is a mistake; it is plausible that younger children answered “yes” to those questions due to some uncertainty about the experimenter’s intentions. In any case, these data provide robust evidence that children understand the notion of mistaken facts, leading us to ask how they apply these concepts to opinions.

Conventional opinion statements Preschoolers’ treatment of conventional opinions (“I like ice cream” or “Ice cream is delicious”) was similar to their treatment of true facts. A logit mixed model using framing condition and age group to predict correct responding to questions about conventional opinion statements showed neither the main effect of age or of framing, nor their interaction, reached significance. When asked about conventional opinions, preschoolers showed a high degree of acceptance without major developmental differences or strong influences of framing. In the marked framing condition, younger children correctly answered these questions at above-chance rates ($M=4.7$, $SD=1.78$), $t(11)=3.25$, $p=.008$, as did older children ($M=4.8$ out of 6, $SD=1.33$), $t(10)=4.54$, $p=.001$. The mean number of questions answered correctly did not differ by age group, $t(20.2)=-.23$, n.s.

In the unmarked framing condition, younger children answered an average of 4.5 questions correctly ($SD=1.5$), more than expected by chance, $t(22)=5.0$, $p<.001$. Likewise, older children correctly answered an average of 5.0 questions correctly, also more than expected by chance, $t(21)=6.5$, $p<.001$. Performance did not differ by age groups on questions about conventional opinions.

Unconventional opinion statements A different picture emerged when we analyzed preschoolers responses to unconventional opinions (“I don’t like ice cream” or “Ice cream is yucky”). The logit mixed model predicting correct responses with framing and age showed a marginal main effect of framing but a significant interaction between framing and age. For younger children, framing had little effect: performance was weak in *both* framing conditions. In the marked framing condition, younger children correctly answered only 1.6 of the 6 questions about unconventional opinions ($SD=2.2$), a rate significantly *below* chance, $t(11)=-2.2$, $p=.05$. In the unmarked framing condition, younger children answered an average of just .70 questions correctly ($SD=.93$), again well fewer than expected by chance, $t(22)=-11.0$, $p<.001$.

Older children showed a relatively strong understanding of unconventional opinions in the marked framing condition (at least compared to younger children), answering an average of 3.7 correctly ($SD=1.5$). However, unlike for all other statement types, this success rate did not differ from chance, $t(10)=1.6$, n.s. Older children’s performance was, however, significantly better than younger children’s, $t(19.4)=-2.8$, $p=.01$. In the unmarked framing condition, performance dropped dramatically for older children. Older children answered an average of only .59 questions correctly ($SD=.80$), again fewer than expected by chance, $t(21)=-14.2$, $p<.001$. The difference between conditions was highly significant for older children, $t(12.9)=6.5$, $p<.001$.

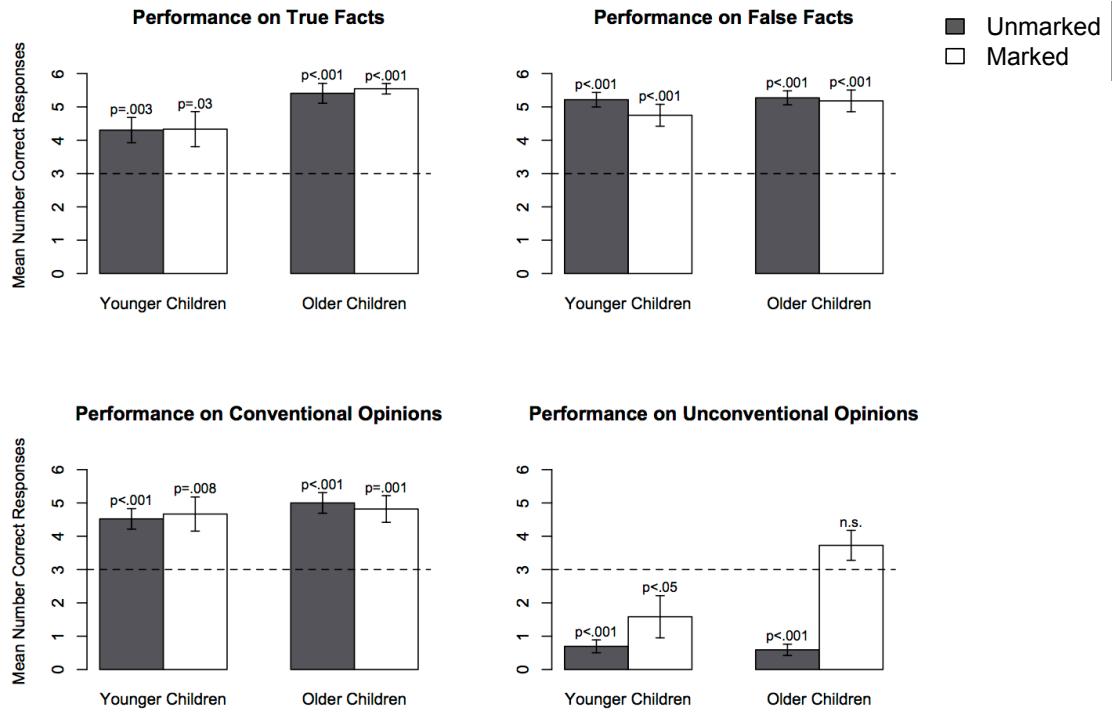


Figure 2: Summary of performance by statement type, condition, and age.

Performance in the unmarked framing condition was equally poor for both age groups, $t(42.5)=.41$, n.s.

Taken together, these data indicate that younger children did not answer our questions about unconventional opinions correctly in either framing condition. Older children did better than younger children in the marked framing condition, although not as well as they had done with questions about facts or conventional opinions. However, framing had a pronounced impact on how older children reasoned about unconventional opinions, reducing their performance to the same level as was seen for younger children.

Results: open-ended explanations

While the yes/no questions allow us one way of probing children's reasoning about unconventional opinions, there are concerns in the literature that such explicit measures might underestimate children's ability to reason in a sophisticated, adult-like fashion about others' opinions (Banerjee et al., 2007). Exploring children's open-ended explanations for why characters might respond with an unconventional opinion provides a less constrained window into children's spontaneous reactions to unconventional opinions.

It is worth noting that children's "explanations" frequently did not constitute what an adult would call an explanation. Frequently, they were simply comments on or responses to what the character had said. Whatever we call them, though, these comments provide a useful probe. To analyze these data, we coded children's responses as to

whether they indicated agreement or disagreement with the character's statement. Below, we report the mean number of times children disagreed with each statement type. There were two trials featuring each statement type, so the maximum number of disagreements is two. Unlike with the yes/no questions, no main effects of framing or age were found, but for consistency's sake we present means broken down by those variables.

True factual statements Disagreements were rare in response to true factual statements. Younger children in the unmarked framing condition expressed a mean of .25 disagreements, while no disagreements were seen for older children in the unmarked framing condition or in either age group in the marked framing condition.

False factual statements Disagreements were much more frequent in response to false factual statements. In the marked framing condition, younger children disagreed an average of 1.2 times, while older children disagreed an average of 1.1 times. In the unmarked framing condition, younger children disagreed an average of 1.0 times, while older children disagreed an average of 1.2 times. Thus across age groups and framing, children expressed disagreement with false facts on more than half of trials. This may not seem terribly high, but it is worth reiterating that children were asked to explain *why* the character had made their statement. Disagreements then weren't particularly good answers for the question that had been posed.

Conventional opinions In the marked framing condition, only one younger child ever disagreed, and did so on only one trial. Similarly, in the unmarked framing condition, a total of one disagreement was recorded among younger children and one among older children.

Unconventional opinions. In the marked framing condition, younger children disagreed on an average of .75 trials, while older children disagreed on an average of only .25 trials. In contrast, in the unmarked framing condition, younger children disagreed on an average of .85 trials, while older children disagreed on an average of .68 trials.

To test whether preschoolers' tendency to disagree differed across statement types, we conducted a logit mixed model using statement type to predict whether the child disagreed on a trial. Contrasts were specified to treat the unconventional opinion as the baseline. Children were significantly less likely to disagree with true factual statements ($b=-3.2$, $z=-5.5$, $p<.001$) and conventional opinions ($b=-4.1$, $z=-5.2$, $p<.001$) than they were to disagree with unconventional opinions. However, children were *more* likely to disagree with false factual statements than with unconventional opinions ($b=1.5$, $z=4.7$, $p<.001$).

These data present a somewhat different picture from that observed with the yes/no questions. To begin with, age and framing did not exert significant influences on whether children disagreed with statements. Moreover, although children disagreed with unconventional opinions relatively often, they did not disagree with unconventional opinions as often as they did with false facts. Thus, whereas the yes/no data might lead us to suggest that preschoolers--especially younger ones--robustly fail to understand that opinions differ from facts in that even unconventional opinions are not *wrong*, our open-ended explanations suggest that preschoolers' understanding is somewhat more nuanced and that they do not entirely conflate facts and opinions.

Study 2

An important feature of both the framings that we have used above is that they articulate properties of long duration. If ice cream is delicious, it is always delicious, not merely delicious right now. Likewise, if I like ice cream, the suggestion is that I like ice cream in general, not just right now. This permanence (or at least longevity) is very characteristic of facts. In contrast, desires are frequently temporary; they disappear when they have been satisfied. Importantly, even if I like ice cream or agree that ice cream is delicious, I may not always *want* ice cream, right now. In the literature reviewed above, preferences have always been conceptualized or demonstrated in terms of a situation-specific want. For example, Wellman and Woolley (1991) probe 2-year-olds' understanding of discrepant desires by asking participants which of two equally desirable activities they would want to engage in and saying the character wanted to do the other. This situation of choosing between two attractive options and temporarily prioritizing one is likely to be familiar even to 2-year-olds, and likely poses weaker demands on children's incipient theory of mind abilities.

One possibility, then, is children's relatively poor understanding of unconventional opinions in study one is that our framings made characters' preferences sound immutable and permanent. If children associate these features with facts but not with desires, children might show themselves to be more tolerant of unconventional opinions if the framing emphasized the transient nature of the unconventional opinion. Below, we present work in progress that tests this possibility by implementing a "want" framing.

Procedure

The procedure was identical to that of Study 1, except opinion statements were presented using a "want" framing instead of marking them with "I like" or not marking them. Thus, characters who expressed a conventional opinion said, for example, "I want some ice cream" while characters who expressed an unconventional opinion said, for example, "I don't want some ice cream."

Results

Data collection is on-going. However, in the condition of interest, unconventional opinions, it is clear that this "want" manipulation has not improved performance. The modal number of correct responses is zero; the maximum number of correct responses thus far is three out of six. This pattern is virtually indistinguishable from that seen for the unmarked condition reported above.

We do not wish to over-interpret this preliminary data. Nonetheless, the performance of children in this pilot indicates that using a want framing is no magic bullet. Using language that emphasizes that an unconventional desire might be temporary does not seem to radically improve children's performance.

General Discussion

Much has been made of quite young children's ability to reason about preferences in several different circumstances. There is no denying that children's appreciation of others' mental lives is far richer than was once thought, but the data we present here underscore that developing a theory of mind is a complex and protracted process. In our samples, even older four-year-olds—who, the literature suggests, would pass traditional tests of false-belief understanding—rejected unconventional opinions as mistaken or silly, at least when those opinions were expressed using factual-sounding language.

Given that toddlers seem able to respond appropriately to desires they do not share, why would our substantially older preschoolers persist in rejecting unconventional preferences? The possibility remains that reasoning about enduring, temporally unbounded likes or dislikes might be more demanding than reasoning about a desire in a specific situation. Our data collected thus far, however, suggests that a very simple change to the framing of characters' desires—using the stem "I want" instead of "I like"—is not enough to render preschoolers accepting of unusual wants. It is premature to jump to conclusions, of course. A more explicit

change to the framing to emphasize the temporariness of the desire might have a greater impact.

It may also be more difficult for preschoolers to reason about discrepant preferences when the preferences are highly surprising. In the existing literature, children were asked to reason about comparably attractive options (Wellman & Woolley, 1991). In these cases, children in fact probably like both alternatives but picked one over the other on that occasion. It might not be difficult to recognize that someone might prefer to go to the park and someone else to the beach on a given occasion. Children also succeed on relatively unfamiliar items (Ma and Xu, 2011), where they may have only a weak opinion of their own.

Moreover, children are highly attuned to statistical information, as work in a broad array of domains demonstrates (Gergely et al., 2007; Kushnir, Xu, & Wellman, 2010; Ma & Xu, 2011; Saffran, Aslin, & Newport, 1996). Liking for ice cream is likely highly overlearned, perhaps so much so that children cannot conceive of someone disliking it. Such a sensitivity to statistical regularities could interact with a non-representational theory of mind, reinforcing the notion that some mental states are veridical copies of the world itself.

Importantly, adults show analogous difficulties with reasoning about preferences and opinions in some circumstances. Ross, Greene, & House (1977) coined the term “false consensus effect” to describe the robust bias in adults to assume that more people will endorse a belief when the participant also endorses that belief. This is of course a more subtle phenomenon than outright rejecting opinions that do not concord with one's own. Nonetheless, many of the explanations that have been offered to explain the false consensus effect in adults may shed light on children's behavior. For example, adults using anchoring and adjustment heuristics, whereby a person makes an initial prediction about others' behavior based on one's own behavior and then adjusts for others' idiosyncrasies, tend to systematically under-adjust (Epley & Gilovich, 2006). If children are prone to egocentrism, the failure to adjust sufficiently for differences among people might be especially pronounced.

Likewise, motivational effects have been posited to explain adults' false consensus effects: adults simply want to be in the mainstream, and assuming others agree with them makes them feel good (Marks & Miller, 1987). The idea of social norms is becoming especially salient in the preschool years (Nucci & Turiel, 1978), and children may well view liking the right foods as one such norm. Indeed, liking the right foods is an important social signal for adults (e.g., eating caviar or eating french-fries). Not wanting the right foods may thus be a mistake in preschoolers' eyes in a social sense that differs from the way they apply that term to false facts.

These considerations illustrate the range of cognitive factors that underpin reasoning about preferences. Even as children's understanding of mental lives increases through the preschool years, many of the factors that lead to naïve realism in adults render children's understanding of unconventional preferences susceptible to the influence of linguistic framing. The robustness with which children

reject unconventional preferences provides a compelling demonstration of the challenges children face in learning to reason about the social world in an adult-like fashion.

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