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Children's Differentiation Between Beliefs About Matters of Fact and Matters of Opinion

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Two experiments investigated children's implicit and explicit differentiation between beliefs about matters of fact and matters of opinion. In Experiment 1, 8- to 9-year-olds' ($n = 88$) explicit understanding of the subjectivity of opinions was found to be limited, but their conformity to others' judgments on a matter of opinion was considerably lower than their conformity to others' views regarding an ambiguous fact. In Experiment 2, children aged 6, 8, or 10 years ($n = 81$) were asked to make judgments either about ambiguous matters of fact or about matters of opinion and then heard an opposing judgment from an expert. All age groups conformed to the opposing judgments on factual matters more than they did to the experts' views on matters of opinion. However, only the oldest children explicitly recognized that opinions are subjective and cannot be "wrong." Implications of these results for models of children's reasoning about epistemic states are discussed.

Keywords: fact versus opinion, epistemology, subjectivity, implicit, explicit

A great deal of research on children's understanding of beliefs has focused on children's appreciation that they and others can hold beliefs about the world that are false (e.g., Wellman, Cross, & Watson, 2001). However, several lines of research have addressed differences among beliefs, showing that the understanding of false belief, evaluated against an objective and external reality, does not constitute the entirety of belief understanding. Specifically, beliefs may often depend on internal, subjective experiences and preferences, as in the case of aesthetic judgments and personal taste, and such beliefs cannot simply be judged as either correct or incorrect. Existing research has suggested that whereas the diversity of personal preferences is acknowledged early on, children's understanding of the subjective nature of opinions continues to mature into adolescence and possibly beyond. This study explores the possibility that children's explicit recognition of the subjectivity of beliefs about matters of opinion appears later than, and is dissociated from, an implicit distinction between facts and opinions in their behavioral responses to the judgments of others.

It is important to note at the outset that the distinction between matters of fact and matters of opinion is not necessarily clear-cut. Kuhn, Cheney, and Weinstock (2000) distinguished among several judgment domains: personal taste, aesthetic judgment, value judgment, truth about the physical world, and truth about the social world. As these researchers have observed, people may identify objective and subjective dimensions as relevant to each of these domains. Disputes about complex matters concerning historical events or even physical phenomena will undoubtedly be influenced by subjective concerns, preferences, and reactions, and people often form opinions about matters (e.g., political views, attitudes toward a film) on the basis of objective, externally available information. Indeed, even within one domain, there are likely to be variations in the balance between objective and subjective dimensions. For example, some matters of taste may be entirely dependent on subjective preferences, whereas beliefs about other matters of taste (e.g., evaluative judgments about fine art or cuisine) may be heavily influenced by external criteria. In this study, we focused on children's ability to distinguish between relatively simple matters of fact in which a single, decisive objective dimension is clearly salient (e.g., the length of a line, the age of a person) and matters of taste and aesthetic preference in which elementary school children are unlikely to see any obviously salient objective dimension that points to a "right" or "wrong" answer.

Existing work has suggested that even young children may recognize the legitimacy of differing opinions about matters of

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taste or aesthetic preference. In an investigation of children's theory of mind, Flavell, Flavell, Green, and Moses (1990) provided convincing evidence that 3-year-olds find it easier to attribute nonnormative value beliefs (indications of personal preference and opinion) to people than to attribute false beliefs about factual matters to them. Moreover, children of this age are better able to predict a person's behavior on the basis of their stated value beliefs than on the basis of their stated fact beliefs. This makes sense in view of theory and empirical evidence that children's commonsense theory of mind may focus on individual differences in desire (into which value beliefs can be easily translated) before comprehending the notion of false belief (Wellman, 1990).

Work using other methodologies has also supported the notion that young children have no difficulty with accepting differing points of view regarding matters of taste. Carpendale and Chandler (1996), for example, have pointed out that 5-year-olds can appreciate the legitimacy of diverse personal preferences (e.g., regarding taste), even though it is not until 7 years of age that children can comprehend that two people can reasonably be predicted to have different points of view regarding ambiguous facts (e.g., ambiguous line figures, lexical ambiguity; see also Pillow & Henrichon, 1996). This dissociation led Carpendale and Chandler to suggest that children's early appreciation of the legitimacy of differing personal tastes and preferences should not be seen as a psychological insight into the "interpretive nature of knowledge."

Indeed, existing work has suggested that early support for the legitimacy of diversity in opinion beliefs cannot be assumed to reflect an understanding of the epistemic nature of these beliefs, as distinct from that of beliefs about factual matters. Wainryb, Shaw, Langley, Cottam, and Lewis (2004) assessed tolerance of differing viewpoints on various matters (is it okay to have differing beliefs?) and the degree of relativist thinking about these beliefs (are the differing beliefs both right?). A majority of 5-year-olds held tolerant attitudes toward disagreements about matters of taste. However, analyses of children's explanations for their judgments about relativism showed that the distinction between statements of personal taste and beliefs about ambiguous facts increased with age: At age 5 years, 56% of justifications appealed to the truth regarding disagreements over ambiguous facts, but 47% of justifications regarding taste did so, too—more than the 34% referring to subjective preference. In contrast, by the age of 9 years, just 6% of explanations regarding taste disputes referred to truth, with 94% referring to subjective preference. Taken together with the evidence of Carpendale and Chandler (1996), these findings strongly suggested that although young children may be tolerant of differing statements about personal taste, this does not reflect an appreciation of the subjective basis for (and hence validity of) those beliefs.

The notion that it is toward the end of middle childhood that children begin to acquire a genuinely relativist understanding of personal preferences as founded on subjective preferences is consistent with evidence from studies of lifespan epistemological development. Kuhn et al. (2000) asked children and adults to judge whether opposing beliefs in various judgment domains could both be right (or have some "rightness"). Results suggested that relativist thinking regarding matters of opinion is evident in middle childhood, with "the transition to the multiplist [relativist] level most likely to appear first in personal taste and aesthetic judgment domains and last in the truth domains" (p. 324). Wainryb et al.'s (2004) findings, discussed above, suggest that this early emergence of relativist accounts of beliefs about matters of personal taste is itself likely to reflect a growing ability to reflect on the importance of subjective preferences between 5 and 9 years of age.

Recent work by Rowley and Robinson (in press) has provided further evidence for developmental change in and beyond middle childhood with regard to the appreciation of subjectivity. The authors focused on two key issues in judgments about diverse beliefs regarding matters of ambiguous fact and matters of personal taste: references to internal factors (e.g., personal preference) versus external factors (e.g., available information) when explaining the legitimacy of differing viewpoints and the extent to which truth can be discovered about the issue at hand (or used to resolve the differences). Their two experiments showed developmental progression in the understanding of subjectivity. The youngest children tested (aged 6 years) failed to distinguish between differing beliefs about factual matters and differing beliefs about personal taste, with equal references to internal and external factors when explaining diversity in both cases and equal affirmation that truth could be found for both types of dispute. Slightly older children (between 7 and 9 years of age) did refer to subjective preference as a basis for diversity in personal taste more than for diversity in factual beliefs but often still believed that the truth could be found and that such truth is relevant to the resolution of the dispute. Beyond middle childhood, at ages 11 and 13 years, children were more likely to display a mature understanding of disputes over personal taste as independent of external truth and thus unresolvable.

All of this evidence seems to converge on a model of epistemological development whereby an early tolerance of diverse statements reflecting personal taste matures between ages 5 and 11 years into a relativism about opinions that is based on an appreciation of the subjective nature of such beliefs. Beliefs about matters of opinion, then, come to be seen as distinct from beliefs about facts, such that only the latter can be decisively tested against objective reality. Crucially, however, these studies all rely on explicit, metacognitive reflection on the nature and origin of different types of belief. This leaves open the possibility that children could demonstrate the distinction between factual beliefs and opinions through their behavior, even though their explicit reasoning may indicate a different, less advanced understanding.

There is good reason to suggest that children's understanding of distinctions among different types of beliefs may appear at an implicit level before they show such knowledge in their explicit reasoning. The notion that much of children's knowledge at first is present in an implicit, nonverbal, procedural format, before progressing to increasingly explicit levels, can help us make sense of much of children's cognitive development (see Dienes & Perner, 1999; Karmiloff-Smith, 1992). In the context of solving arithmetic problems, for example, Siegler and Stern (1998) have used microgenetic analyses to show that children often discover and use a new, efficient strategy for problem solving before they are able to report explicitly on this new strategy. Furthermore, research evidence has already suggested that false belief understanding may appear at an implicit level (e.g., as shown by correct eye gaze) in advance of demonstrated explicit understanding (Clements & Perner, 1994; Ruffman, Garnham, Import, & Connolly, 2001). Importantly, Dienes and Perner (1999) have suggested that at certain periods of development, nondeclarative responses may rely on a

"more accurate and developmentally advanced" (p. 748) knowledge base that is dissociated from the less accurate and advanced knowledge base that supports declarative responses.

We have already seen that young children of 5 years are typically tolerant of differing subjective judgments about many matters of opinion, and there is good evidence that children of this age can conceive of desires as idiosyncratic and subjective (Yuill, Perner, Pearson, Peerbhoy, & van den Ende, 1996). Against this background, it seems plausible that these children may have an implicit recognition of the equal validity of differing subjective judgments, despite explicitly overextending their belief in the existence of objectively "correct" answers to matters of opinion. At this point in development, then, children's nondeclarative responses to judgments about facts and opinions may rely on relatively advanced (but currently inaccessible) knowledge about the nature of facts and opinions, whereas their declarative responses to explicit questions about the epistemic status of differing factual judgments and opinions would be supported by a (flawed) assumption that, for example, a single "truth" can always be found (e.g., Rowley & Robinson, in press). Accordingly, the difficulties exhibited by young children in the research discussed earlier may be seen neither as a complete failure to appreciate the subjectivity of opinions nor as some simple difficulty in verbally articulating what is already understood. Rather, children may possess an explicit conviction in the existence of the truth for all matters, regarding both facts and opinions, that is dissociated from their implicit knowledge of the distinction between facts and opinions.

If young children do indeed make an implicit distinction between beliefs about matters of fact and matters of opinion, then how may we measure this in empirical work? It seems logical to try to work backward from the explicit, declarative knowledge involved in stating that two differing opinions are equally valid. Specifically, we suggest that in order to infer an implicit, procedural awareness of the distinction between facts and opinions (which goes beyond establishing mere tolerance of differing opinions), children would have to exhibit systematically different behavioral responses to matters of fact and opinion. In particular, children must demonstrate their awareness that there is no single right judgment of matters of opinion, rather than reporting on this awareness explicitly. Interestingly, a 1979 study on children's comprehension of the "objectivity-subjectivity distinction" did exactly that, although the two methodologies were not deliberately contrasted in this way (Rothbaum, 1979).

In Rothbaum's (1979) study, children between the ages of 7 and 14 years answered explicit questions about age (fact/objective) and attractiveness (opinion/subjective) judgments, such as "Would one of [two differing answers] have to be wrong?" However, they were also required to make judgments themselves about the oldest and best-looking face in sets of four photographs after seeing the (purported) responses of their parents or of adult strangers. Results showed that conformity to the adult responses was greater for age judgments than for attractiveness judgments in the oldest children but not in the younger children and that this developmental increase in differentiation between objective and subjective judgments was linked to the increase with age in explicit understanding of the subjectivity of the attractiveness judgments. Rothbaum argued that children begin to show different behavioral responses to beliefs about facts and opinions (i.e., being influenced more by the adults' judgments about matters of fact than by their judgments about matters of opinion) as a consequence of their rising comprehension of subjectivity.

Despite the apparent coherence of the two methodologies utilized by Rothbaum (1979), we suggest that the conformity measure should reveal implicit understanding of the fact–opinion distinction earlier than (rather than as a consequence of) the emergence of correct explicit responses. In Rothbaum's study, the conformity task may have been unduly taxing for the younger children, with each child having to make 72 age and attractiveness judgments about the same kinds of photographs. Furthermore, providing alleged responses of parents may not be the most appropriate manipulation to elicit differentiated conformity responses. In the two experiments presented here, we used smaller numbers of carefully selected trials requiring children to respond to peer or expert judgments about matters of fact or opinion.

Experiment 1

Our first experiment tested an adaptation of Rothbaum's (1979) procedure of asking explicit questions about objective and subjective judgments along with a measure of conformity to others' responses. For assessing explicit awareness of the fact–opinion distinction, we closely followed Rothbaum's methodology, presenting 8- to 9-year-olds with sets of photographs of similar-looking faces and asking whether one of two differing answers to a fact question and an opinion question ("Which one is the oldest?" and "Which one is the nicest?" respectively) would have to be wrong. We expected to replicate Rothbaum's finding that most children of this age are able to recognize that matters of fact can be evaluated as right or wrong yet fail to recognize the subjective nature of the attractiveness judgment.

For assessing implicit awareness of the distinction between matters of fact and opinion, we departed from Rothbaum's method of requiring a series of age and attractiveness judgments from children following presentation of parents' (alleged) responses. Instead, we used a simpler methodological paradigm from the conformity literature whereby each participant's judgments on a series of tasks were sought following presentation of unanimous choices by a group of (fictitious) peers. One line-matching task—the "unambiguous fact" task—had one clearly correct answer, whereas the correct answer to a second line-matching task—the "ambiguous fact" task—was very difficult to determine. In line with long-standing evidence from studies of conformity on line-matching tasks (Hoving, Hamm, & Galvin, 1969; Walker & Andrade, 1996), we expected much greater conformity to a unanimous but incorrect peer response on the ambiguous line-matching task than on the unambiguous line-matching task. Critically, we presented children with a third "opinion" task in which children were asked to view a set of three houses and select the best house in which to live, after first informing them of a unanimous choice from peers. If 8- to 9-year-olds do have an implicit awareness of the subjectivity of attractiveness judgments, they should be less likely to conform to the peers on this task than on the ambiguous fact task. Comparing their responses on the opinion task with their level of independence on the unambiguous fact task enabled us to assess the relative confidence of children in the validity of their subjective judgments. It should be noted that the implicit tasks were always presented before the explicit tasks, so that behavioral responses to others' judgments could be measured in the absence

of any prior evaluation of whether answers to the questions could be considered right or wrong.

Method

Participants. The sample consisted of 88 children aged 8–9 years ($M = 8.79$ years, $SD = 0.56$; 48 girls). Children were mostly White and attended a school in an urban neighborhood.

Materials. Children were presented with five A4 sheets. Two sheets had three reference lines and one target line that was the same length as one of the three reference lines. In one of these sheets, the three reference lines were clearly different in length, and only one clearly matched the length of the target line. In the other, the three reference lines were all of similar length and difficult to tell apart. A third A4 sheet presented photographs of three similarly sized and apparently well-maintained houses with no obvious signs of damage or disrepair. Finally, one sheet presented three photographs of similar, youthful male faces, and a last sheet presented three photographs of similar female faces. None of the faces depicted on the last two sheets showed any obvious sign of disfigurement or differences in aging, and all were smiling.

Design and Procedure. Children were seen individually by one of four female or male experimenters in a quiet location in their school. Each child was presented with three tasks designed to tap an implicit understanding of the fact–opinion distinction: an ambiguous fact task, an unambiguous fact task, and an opinion task.[1] In the ambiguous fact task, children saw a target line and three reference lines of similar lengths, and the task was to select which of the three reference lines was the same length as the target line ("Which of these lines is the same length as that line?" pointing to stimuli as appropriate). In the unambiguous fact task, children also saw a target line and three reference lines, but two of the reference lines were very clearly of different lengths to the target line. In the opinion task, children saw pictures of three houses and were asked, "Which of these three houses would be the best house to live in?" Earlier work with a pilot sample had confirmed that children did indeed all know the correct answer to the unambiguous fact task and that children were evenly divided in their spontaneous responses to the ambiguous fact and the opinion tasks. For each implicit task, children were asked the question, but before they marked their answer on a sheet of paper, they were shown six pieces of paper alleged to be the responses of other children who had completed the task. These six pieces of paper unanimously listed an incorrect answer for both the ambiguous and unambiguous fact tasks, and unanimously listed one of the houses for the opinion task. Children were then asked to write down their own answer. The precise wording used after the children were asked the question about the stimuli was: "Just before you write it down, I'll show you what other children have written. [Show responses one at a time]. Oh! They've all chosen X! All these people have said X. You write down your answer now." The order of the three tasks was randomized.

Finally, children received two tasks designed to tap an explicit understanding of the fact–opinion distinction. For each task, children saw a set of three male or female faces and were told that they were brothers or sisters. Children were told that the task was to decide which person was the oldest (explicit fact) or which person was the nicest (explicit opinion). They were asked to imagine that they and a friend had chosen different faces, and they were then asked whether one of these two answers would be wrong ("Say that you picked this one and your friend picked that one. Would one answer be wrong?"). The order of the two tasks was randomized.

Results

Explicit understanding. Preliminary analysis showed that no significant effects of order were observed on the responses to the explicit questions. The proportions of children claiming that there would or would not be a wrong answer to the fact and opinion questions are provided in Table 1. Excluding those children who gave a "don't know" response, a McNemar test demonstrated that children were significantly more likely to say there was a wrong answer for the fact question and not for the opinion question (20 out of 73, 27.4%) than vice versa (5 out of 73, 6.8%; $p < .005$). However, binomial tests showed that whereas children indicated that there was a wrong answer for the fact question at a level greater than expected by chance ($p = .001$), they scored at chance on the opinion question ($p > .5$).

Implicit understanding. Preliminary analysis showed that no significant effects of order were observed on the tendency to conform to the fictional peer judgments. However, as predicted, the proportions of conforming responses were significantly different across the three tasks, Cohran's $Q(2) = 41.84$, $p < .001$. Specifically, 24 of the 88 children (27.3%) conformed on the unambiguous fact task and 27 of the 88 children (30.7%) conformed on the opinion task—both proportions slightly less than would be expected simply by chance—but 63 out of the 88 children (69.3%) conformed on the ambiguous fact task, over double the proportion that would be expected by chance. McNemar tests confirmed this distinction between the ambiguous fact task and the other two tasks (ps $< .001$) and showed no significant difference between the unambiguous fact task and opinion task ($p > .5$).

A final analysis demonstrated that there was no significant association between the explicit understanding of subjectivity and the amount of conformity displayed on the attractiveness task. Seventy-five percent of children who showed an explicit understanding that matters of opinion have no wrong answers did not conform to the unanimous choice regarding the best house in which to live, but this was also true for the majority of children who thought that matters of opinion do have a wrong answer (65% did not conform) or simply did not know (64% did not conform), $\chi^2(2, N = 88) = 1.12$, *ns*. Furthermore, a direct comparison between the implicit and explicit measures of understanding subjectivity (excluding children who said they did not know in response to the latter) showed that significantly more children stated explicitly that there would be a wrong answer to a subjective question, yet still did not conform to the unanimous response regarding the best house in which to live (31.2%), than did the opposite pattern (13%), indicating that implicit awareness of subjectivity is significantly more apparent in this age group than is explicit awareness (McNemar test, $p < .05$).

[1] Children were presented with several other tasks using different methodologies for pilot research addressing separate research questions not addressed here.

Table 1
Number and Percentage of Children Indicating That One of Two Different Answers to a Question Would or Would Not Be Wrong, by Question Type (Experiment 1)

Question type	Would not be a wrong answer		Would be a wrong answer		Don't know	
	n	%	*n*	%	*n*	%
Fact	24	27.3	54	61.4	10	11.4
Opinion	40	45.5	37	42.0	11	12.5

Discussion

The results regarding our explicit questions about the subjectivity of attractiveness judgments and the objectivity of age judgments suggest that 8- to 9-year-olds can acknowledge the objective nature of factual beliefs but often fail to recognize the distinctively subjective nature of value beliefs. The majority of the children recognized that questions about matters of fact can be judged as right or wrong but were equally divided (responding at chance level) about whether the same can be said for matters of opinion. This pattern of results is consistent with Rothbaum's (1979) findings.

However, the children's responses on the conformity tasks clearly reflected a distinction between the ambiguous fact task and the attractiveness task, with much greater conformity to peer responses on the former than on the latter. In fact, children appeared to be as confident in the validity of their independent, subjective judgments about attractiveness as they were about the evidence of their own eyes in the unambiguous line-matching task, with less than a third of children conforming in each case. In fact, this confidence in subjective judgments might be even more pronounced because a proportion of those who did conform on the attractiveness task may have selected their response purely on the basis of their own subjective preference (without any influence by the unanimous peer choice).

This finding contributes to a complex portrait of 8- to 9-year-olds' understanding of the distinction between matters of fact and opinion. On the one hand, the subjectivity of attractiveness judgments was not universally appreciated by the children, with an even split between those saying that one of two different answers would be wrong and those saying that it need not be wrong. On the other hand, the children as a group showed a clear distinction in patterns of conformity on judgments about matters of opinion (attractiveness of house) and ambiguous matters of fact (line matching), with more than double the proportion conforming to peer judgments on the latter than on the former. Thus, the children clearly were far more influenced by others' responses on the ambiguous fact task than on the attractiveness task. Extending Chandler, Boyes, and Ball's (1990) developmental analysis of young persons' "working distinctions" between facts and opinions, these findings suggest that 8- to 9-year-olds turn to the unanimous majority view as an important, external guide to objective reality when confronted with ambiguous facts but are confident in their own internal preferences as sufficient justification for beliefs about matters of opinion.

Moreover, regardless of responses to the explicit task, a clear majority of children did not conform to the peer judgment on the attractiveness task. Thus, explicit comprehension of subjectivity was not a prerequisite for greater conformity on objective than on subjective judgments. Using Rothbaum's (1979) methodological approaches to children's epistemological understanding—measuring conformity to others' judgments about objective and subjective questions as well as responses to explicit questions—but with different stimuli and simpler procedures, we found evidence that an implicit distinction between objective and subjective matters could be exhibited in children's behavior even when they do not make such a distinction in their explicit responses.

It is important to stress that this study included only a limited range of stimuli, which varied between explicit and implicit tasks and between fact and opinion versions of the implicit task. In addition, the nature of the implicit measure was such that genuine personal preferences could potentially be conflated with conformity to the peer judgment, making it difficult to assess the precise extent to which individual differences in implicit differentiation were independent of variability in explicit responses. Our next study sought to address these limitations and add more detail to our understanding of children's differentiation between facts and opinions.

Experiment 2

The results from our first experiment fill in some of the detail missing in our understanding of the transition from an absolutist model of epistemology, where all beliefs may be classed as right or wrong, to a multiplist conceptualization of matters of opinions. Our sample's responses to others' judgments about matters of fact and opinion suggested that 8- to 9-year-olds are beginning to appreciate the subjectivity of the aesthetic domain while maintaining a clear focus on external sources of information when evaluating factual matters. This extends Kuhn et al.'s (2000) finding that only a minority of the 7- to 8-year-olds they interviewed showed such domain-specific multiplism.

Our suggestion that limitations in the explicit understanding of the fact–opinion distinction may mask clear differentiation in behavioral responses to others' judgments about matters of fact and opinion clearly needs the support of a developmental analysis. In this second experiment, we assessed the implicit and explicit understanding of the fact–opinion distinction in three groups aged 6, 8, and 10 years. We anticipated that children's behavioral responses to others' judgments would be similarly distinguished along the fact–opinion divide in all age groups, even though the same children's explicit understanding of subjectivity was expected to increase with age.

In addition to including three age groups, we made several methodological changes in this study in order to address limitations in the first experiment. First, rather than relying on single trials for fact and opinion domains, Experiment 2 involved four ambiguous fact tasks and four opinion tasks. It should be noted that the unambiguous line-matching task in Experiment 1 had served its purpose as a reference task for evaluating children's conformity responses on the ambiguous fact and opinion tasks, and therefore no further unambiguous tasks were designed for this study. Second, in order to avoid confounding the type of stimuli with the domain of belief (fact and opinion) or with the form of knowledge

being assessed (explicit and implicit), we used four sets of photographs of everyday objects (houses, toys, dogs, and cakes) about which we sought judgments on questions of both fact and opinion, and with reference to which we asked our explicit questions about the existence of a wrong answer. This addressed an important limitation in Experiment 1, where the explicit and implicit tasks involved different stimulus sets. In this experiment, we sought to obtain information about children's explicit and implicit understanding of the fact–opinion distinction in the same four contexts.

Third, in order to provide a stricter test of children's independence on subjective judgments and to avoid any possibility of conflating chance responding with social influence, we adopted a three-stage approach to the implicit measure and used expert judgments in place of peer responses. We first obtained children's judgments, then presented a discrepant judgment from an expert in the matter at hand (e.g., a veterinarian's judgments on questions relating to dogs), and then gave the children a chance to change or maintain their response. Existing research has documented the attention paid by children in middle childhood to knowledge, social context, and social-organizational position as the basis for the legitimacy of directives (Damon, 1977; Laupa, 1991; Laupa & Turiel, 1986, 1993), and the judgments of people with context-specific social positions and expertise can therefore be assumed to be a particularly powerful source of influence. Maintaining a subjective attitude in the face of an expert's discrepant opinion, while conforming to the expert's view on factual matters, would provide particularly strong evidence for the children's distinction between the two domains of judgment. Finally, we obtained detailed quantitative and qualitative responses from children regarding their confidence in, and reasons for, their judgments.

On the basis of the hypothesis that implicit understanding of the fact–opinion distinction is present in all the age groups, we expected children to be more likely to change their selection following the expert judgment on fact questions than on opinion questions and accordingly to offer qualitatively different accounts of their behavior in response to fact and opinion questions (e.g., referring more to expert judgments on matters of fact and more to the stimuli themselves on matters of opinion). Furthermore, if children were observed to change their response on fact judgments following expert judgments, we expected them to be more confident in their new, informed answers, in comparison to their old, uninformed answers. In contrast to these measures, however, explicit references to the epistemic nature of objective and subjective beliefs—such as statements about the validity of subjective judgments on matters of opinion—were predicted to increase in frequency with rising age, similar to the performance on the explicit questions about the existence of wrong answers.

Method

Participants. The sample consisted of 27 children aged 6 years (M = 6.26 years, SD = 0.27; 15 girls), 26 children aged 8 years (M = 8.21 years, SD = 0.27; 15 girls), and 28 children aged 10 years (M = 10.29 years, SD = 0.29; 11 girls). Children were mostly White and attended a school in an urban neighborhood.

Materials. Children were presented with four laminated A4 sheets, each with three photographs labeled A, B, or C. One set of photographs showed three children's toys, a second showed three houses, a third showed three dogs, and the last showed three desserts (portions of cake). The three items in each photograph varied in color, shape, and featural details, but they were all similarly sized, bright, and colorful, and there were no cues pointing to obviously negative qualities (e.g., none of the houses showed any sign of disrepair, all of the desserts appeared to be presented as they might be served in a restaurant).

Design and Procedure. Children were seen individually by a female experimenter in a quiet location in their school. Each child was presented with eight tasks, with a "fact" task and an "opinion" task for each of the four sets of photographs described above. For each task, children were first asked to make a judgment about the matter of fact or opinion at hand (e.g., "Which dessert takes the longest to bake?" or "Which dessert is the most tasty?"). They then rated their confidence in their answer on a 4-point scale (from *not sure at all* to *very sure*). They were then told the answer allegedly given by an expert (e.g., a baker who spends a lot of time making different desserts). This answer was different from the child's own response for three of the fact and three of the opinion tasks; for the two remaining "filler" tasks, the expert's judgment matched the child's judgment. Children were reminded of their original response and asked if they wanted to change their answer. They then rated their confidence in their final answer. They were asked to justify why their response changed or stayed the same. Finally, to assess explicit understanding of the fact–opinion distinction, children were asked to imagine that two hypothetical characters gave opposing responses to the question and were then asked whether one of those characters would have to be wrong. They were also asked to justify their answer to this question. The eight tasks were presented in a random order, except that one fact "filler" task and one opinion "filler" task (where the experts' judgments matched the child's own response) were always presented in the third and sixth position. The experts' choices and the two hypothetical characters' choices were selected randomly. Tasks and questions are listed in the Appendix.

Scoring

Children's confidence ratings always ranged from 0 (*not at all sure*) to 3 (*very sure*). Children received a mean initial confidence rating across the four fact questions and a mean initial confidence rating across the four opinion questions. They also received "change" scores indicating the number of times they changed their initial response after hearing the expert judgment. This was calculated once for the fact questions for which the expert gave a different response to the child, and once for the opinion questions for which the expert gave a different response to the child; both scores could range from 0 to 3. Children also received four "confidence difference" scores indicating the mean difference in confidence from before to after hearing the discrepant expert judgment. This mean difference was calculated for fact questions for which the child had changed the response following the discrepant expert judgment, for fact questions for which the child did not change the response, for opinion questions for which the child changed the response, and for opinion questions for which the child did not change the response. These confidence change scores could range from –3 to + 3, with positive scores indicating lower confidence in the second answer and negative scores indicating greater confidence in the second answer.

Children's justifications for why their response changed or stayed the same were coded into the following four categories: (a) reference to some aspect of the stimuli (e.g., "Because that dog looks like it's smiling," "That house just looks nicer"); (b) direct or indirect reference to the expert's judgment (e.g., "She works with dogs so she'd know more than me," "I changed because I wanted to get it right"); (c) reference to validity of different opinions (e.g., "People like different things," "It's just my opinion," "You don't have to follow what the expert says"); and (4) residual responses, including "don't know." Twenty percent of the children's justifications were scored by another rater blind to the age of the children, and interrater agreement was high (97%, $\kappa = .95$). Children received scores for the number of times each type of justification was used across the three fact questions and the three opinion questions where the expert gave a discrepant response.

For the final item tapping explicit understanding of the fact–opinion distinction, we calculated the number of fact questions and number of opinion questions (both out of four) for which children said one of two different responses would have to be wrong. Children's justifications were coded into one of six categories: (a) reference to the earlier expert's judgment (e.g., "One would have to be wrong because Peter said C"); (b) statement of own judgment (e.g., "One would have to be wrong because that cake looks gross"); (c) suggestion that there is no wrong answer because the stimuli are the same (e.g., "They both look friendly," "They could be the same age"); (d) suggestion that there is a wrong answer because the stimuli are different (e.g., "They couldn't both be the tastiest," "They can't be the same age"); (e) reference to validity of different opinions (e.g., "It's OK to like different things," "It's just their opinion"); and (f) residual responses, including "don't know." Twenty percent of the children's justifications were scored by another rater blind to the age of the children, and interrater agreement was again high (96%, $\kappa = .95$). Children received scores for the number of times each type of justification was used across the four fact questions and the four opinion questions.

Results

Preliminary analysis on the children's first response to each question showed that there was never a unanimous consensus on the answer to any of the questions. Each response choice was always selected by at least some children, and the proportions selecting the modal response choice ranged between .37 and .70 across the opinion questions and between .40 and .59 across the fact questions. However, across the four stimuli sets, the modal response was selected by children more often for the opinion questions than for the fact questions: means out of four (*SD*s) = 2.44 (0.92) versus 2.05 (1.02), respectively; $t(80) = 2.66$, $p = .01$. In addition, we tested for differences among the fact questions and among the opinion questions, both on the implicit measure (changes to conform to the experts' judgments) and on the explicit question (would one of the answers have to be wrong?). No significant differences between responses to the different stimuli sets were found, either for the fact questions or for the opinion questions.

Initial confidence ratings. A mixed-design analysis of variance (ANOVA) was conducted on the initial confidence ratings, with question type (fact vs. opinion) within subjects and age group (6, 8, and 10 years) between subjects. Partial eta-squared is reported as a measure of effect size for this and all following ANOVA tests. The analysis revealed a main effect of question type, $F(1, 78) = 51.90$, $p < .001$, $\eta^2 = .40$, with confidence for fact questions lower than confidence for opinion questions: *M*s (*SD*s) = 1.95 (0.58) and 2.39 (0.49), respectively. There was also a significant main effect of age group, $F(2, 78) = 8.65$, $p < .001$, $\eta^2 = .18$, with confidence higher in the youngest age group than in the middle and oldest age groups: *M*s (*SD*s) = 2.45 (0.44), 2.01 (0.46), and 2.06 (0.37), respectively. There was no significant interaction between the two variables ($F < 1$).

Changes in response. A mixed-design analysis of covariance (ANCOVA) was conducted on the number of times children changed response after hearing the discrepant expert judgment, with question type within subjects and age group between subjects. The initial confidence ratings for the fact and opinion questions, and the numbers of times the modal response was selected for the fact and opinion questions, were entered as covariates. The inclusion of these covariates serves to ensure that any observed effect of question type could not be attributed to the initial level of certainty regarding, or ambiguity of, the opinion and fact tasks.[2] Even after controlling for these covariates, the analysis revealed a significant main effect of question type, $F(1, 74) = 6.56$, $p = .01$, $\eta^2 = .08$. There was also a main effect of age group, $F(2, 74) = 3.85$, $p < .05$, $\eta^2 = .09$, reflecting a general tendency for children to change their response less with age. Importantly, however, there was no significant interaction between question type and age group ($F < 1$). Figure 1 shows that children in each age group were more likely to change their response following a discrepant expert judgment for fact questions than for opinion questions.

Interestingly, there was also an interaction between question type and the covariate concerning initial confidence in the fact questions, $F(1, 74) = 4.39$, $p < .05$, $\eta^2 = .06$. Further analysis showed that initial confidence in the fact questions was negatively related to the number of changes to conform to the experts' factual judgments, $r(81) = -.34$, $p < .005$. On the other hand, no such pattern was evident for the initial confidence in the opinion questions: Confidence in these instances was unrelated to the level of conformity to the experts' opinions ($r < .10$).

Difference in confidence ratings. We examined four confidence difference scores: for fact questions for which the child changed the response, for fact questions for which the child did not change the response, for opinion questions for which the child changed the response, and for opinion questions for which the child did not change the response. The number of valid data points for each of these four scores varied depending on the number of children who changed or did not change their responses following the discrepant expert judgments: 60 children changed their response on at least one fact question, 34 changed their response on at least one opinion question, 62 showed no change on at least one fact question, and 78 showed no change on at least one opinion

[2] An ANCOVA controlling for the differences between the fact and opinion covariates (i.e., the difference between the initial confidence ratings for the fact and opinion questions, and the difference between the number of times the modal response was selected for the fact and opinion questions) revealed the same pattern: a significant main effect of question type, $F(1, 76) = 19.13$, $p < .001$, $\eta^2 = .20$, and no interaction with age group, $F < 1$.

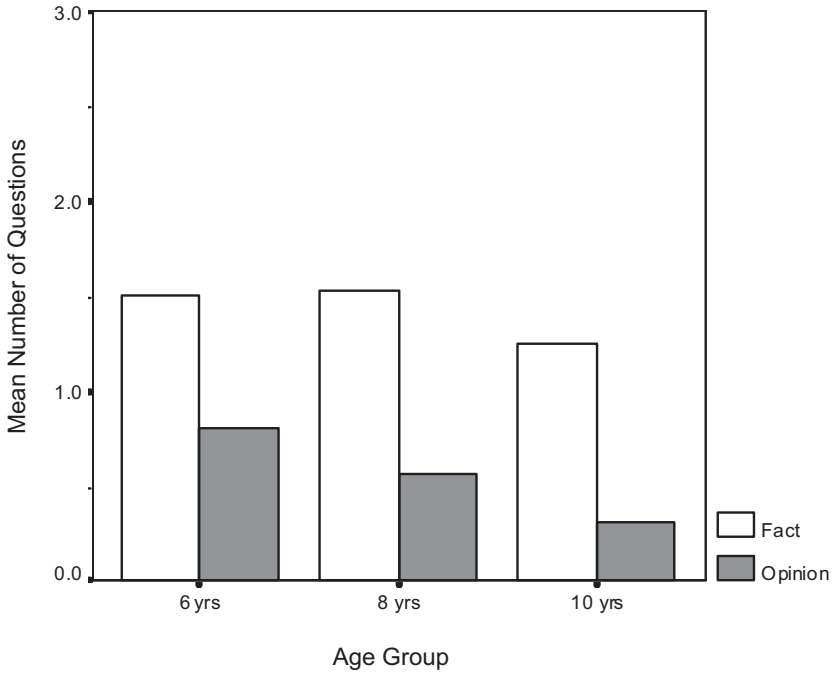

Figure 1. Mean number of questions for which the answer was changed after hearing the expert judgment, by question type and age group (Experiment 2).

question. A one-sample t test was carried out on each of the confidence difference scores to determine whether any significant increase or decrease in confidence was apparent. No significant changes in confidence were found among those who maintained their initial answer in the face of the discrepant expert judgment: mean confidence difference scores (*SD*s) = 0.11 (0.59) and 0.11 (0.50) for fact and opinion questions, respectively; ts < 1.89, ps $> .05$.

As predicted, children who changed their response on one or more fact questions were significantly more confident in their second, informed answers than in their first, uninformed answers: mean confidence difference score (*SD*) = −0.54 (0.97), $t(59) = 4.30$, $p < .001$. Interestingly, the minority who did change their response following the expert judgment on one or more opinion questions did not show this significant improvement in confidence for their new opinions: mean confidence difference score (*SD*) = −0.11 (0.89), $t < 1$. Only 28 children changed response at least once on both fact and opinion questions, but a mixed-design ANOVA on these children's confidence difference scores, with question type within subjects and age group between subjects, confirms that they became more confident in their new answer only for fact questions: mean confidence difference scores (*SD*s) = −0.65 (0.85) for fact questions and −0.10 (0.93) for opinion questions; main effect of question type, $F(1, 25) = 6.86$, $p < .05$, $\eta^2 = .22$. There was no significant interaction between question type and age group ($F < 1.2$).

Justifications for change/no change in response. Table 2 provides the mean number of each type of justification provided by each age group for changing or maintaining their responses to fact and opinion questions. For justifications referring to an aspect of the stimuli, a mixed-design ANOVA with question type within subjects and age group between subjects revealed only a significant main effect of question type, $F(1, 78) = 29.08$, $p < .001$, $\eta^2 = .27$, with these justifications offered more for opinion questions than for fact questions. For justifications referring to the expert's judgments, the ANOVA showed a significant main effect of question type, $F(1, 78) = 34.66$, $p < .001$, $\eta^2 = .31$, with more of these justifications for fact questions than for opinion questions. Only the oldest age group gave a small number of justifications referring to the validity of different opinions, and they tended to do so more for opinion questions than for fact questions, $t(27) = 1.88$, $p < .08$. Finally, an ANOVA on the number of residual justifications given showed only a tendency for such justifications to decrease with age, $F(2, 78) = 3.59$, $p < .05$, $\eta^2 = .08$.

Explicit understanding. The mean numbers of fact and opinion questions for which the child believed one of two different answers must be wrong are presented in Figure 2, subdivided by age group. A mixed-design ANOVA was conducted on these scores, with question type within subjects and age group between subjects. This revealed a main effect of question type, $F(1, 76) = 34.08$, $p < .001$, $\eta^2 = .31$, and a main effect of age group, $F(2, 76) = 6.69$, $p < .005$, $\eta^2 = .15$. The belief that one answer must be wrong was generally higher for fact questions than for opinion questions and was generally higher in the youngest age group. However, these effects are qualified by a significant interaction of question type and age group, $F(2, 76) = 7.79$, $p = .001$, $\eta^2 = .17$. Simple effects analysis confirmed that the simple effect of question type was not significant for the youngest age group, $F(1, 76) = 2.31$, *ns*, but was significant for the middle and older age groups, $F(1, 76) = 4.40$, $p < .05$, and $F(1, 76) = 44.01$, $p < .001$, respectively. We next conducted one-sample t tests to compare the number of questions for which the child believes one answer must be wrong with the

Table 2
Mean (SD) Number of Each Type of Justification Provided by Each Age Group for Changing or Maintaining Their Initial Response, by Question Type (Experiment 2)

	Stimuli		Expert		Validity of opin.		Residual	
Age group	Fact	Opinion	Fact	Opinion	Fact	Opinion	Fact	Opinion
6 years	1.67	2.07	0.48	0.15	0.00	0.00	0.85	0.78
	(1.18)	(1.27)	(0.94)	(0.36)	(0.00)	(0.00)	(1.17)	(1.09)
8 years	1.69	2.42	0.81	0.12	0.00	0.08	0.50	0.38
	(0.93)	(0.81)	(0.94)	(0.33)	(0.00)	(0.27)	(0.81)	(0.64)
10 years	1.57	2.14	0.82	0.11	0.21	0.54	0.39	0.21
	(1.14)	(0.93)	(1.06)	(0.32)	(0.69)	(0.79)	(0.63)	(0.42)
Total	1.64	2.21	0.70	0.12	0.07	0.21	0.58	0.46
	(1.08)	(1.02)	(0.98)	(0.33)	(0.41)	(0.54)	(0.91)	(0.79)

Note. Stimuli = reference to some aspect of the stimuli; Expert = direct or indirect reference to the expert's judgment; Validity of opin. = reference to validity of different opinions; Residual = residual responses, including "don't know."

chance value (2). These showed that the youngest group was significantly above chance for both fact and opinion questions, ts > 2.64, ps $< .05$; the middle group was at chance for both fact and opinion questions, ts < 1.5, *ns*; and the oldest group was above chance for fact questions, $t(26) = 2.95$, $p < .01$, and below chance for opinion questions, $t(27) = 4.25$, $p < .001$.

We next evaluated the extent to which the above findings regarding the explicit and implicit measures were associated with each other. The tendency to respond explicitly that questions had wrong answers was modestly associated with the tendency to conform to experts' judgments, but this was true both within and across fact and opinion domains (rs between .12 and .31, no significant differences among correlations). It should be stressed, however, that the critical main effect of question type (fact vs. opinion) on the number of conforming responses remained significant after controlling for the explicit judgments, $F(1, 74) = 10.31$, $p < .005$, $\eta^2 = .12$, with no significant interaction with age group ($F < 1$). Similarly, the important interaction between question type and age group in explaining explicit judgments about fact and opinion tasks remained significant even after controlling for the number of times children conformed to the experts' judgments on fact and opinion tasks, $F(2, 74) = 6.90$, $p < .005$, $\eta^2 = .16$. Thus, the key patterns regarding implicit and explicit understanding of the distinction between facts and opinions appear to be independent of each other. Indeed, there was some evidence of a double dissociation in the implicit and explicit understanding of the sub-

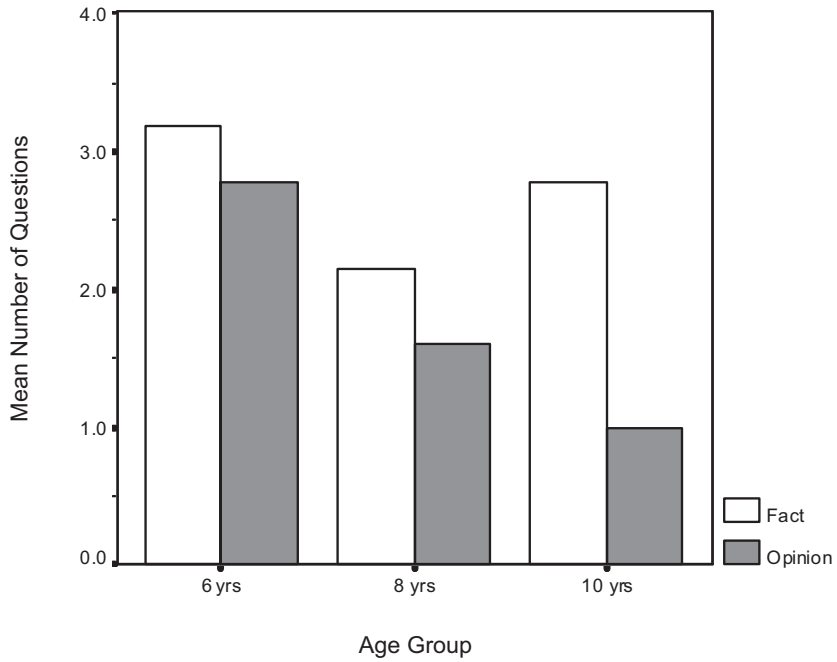

Figure 2. Mean number of questions for which children believed one of two different answers must be wrong, by question type and age group (Experiment 2).

jectivity of opinions: 27 children never conformed to opinion judgments despite claiming explicitly that there was a wrong answer on at least one of the four opinion questions, and 11 children conformed at least once even though they always maintained explicitly that there was no wrong answer on the opinion questions.

Finally, we found again that the explicit awareness of the subjectivity of opinions was in general less evident in this age range than the implicit, procedural awareness. The proportion of responses in which children maintained independence in the face of discrepant expert opinions was significantly higher than the proportion of responses in which children believed that there was no wrong answer to questions about matters of opinion, *M*s (*SD*s) = 0.81 (0.26) versus 0.56 (0.41), respectively; $t(80) = 5.40$, $p < .001$.

Justifications for belief that one answer must/need not be wrong. Table 3 records the mean number of each type of justification provided by each age group for the fact questions and for the opinion questions. For each type of justification, a mixed-design ANOVA was conducted with question type within subjects and age group between subjects. For justifications referring to the expert judgment as a statement of fact, there was a main effect of question type, $F(1, 78) = 7.43$, $p < .01$, $\eta^2 = .09$, with more such justifications given for fact than for opinion questions. It should be noted that although there was no significant interaction with age group ($p > .10$), the mean scores clearly showed that the question type effect appeared in the middle and older age groups only. For justifications referring to one's own judgment as a statement of fact, there was only a significant main effect of age group, $F(2, 78) = 8.38$, $p = .001$, $\eta^2 = .18$, with such justifications decreasing with age. For justifications suggesting that there is no wrong answer because the stimuli are the same, there were no significant effects.

For justifications suggesting that there is a wrong answer because the stimuli are different, there were significant main effects of question type, $F(1, 78) = 18.52$, $p < .001$, $\eta^2 = .19$, and age group, $F(2, 78) = 6.97$, $p < .005$, $\eta^2 = .15$, but these were qualified by an interaction between question type and age group, $F(2, 78) = 11.48$, $p < .001$, $\eta^2 = .23$. Only the oldest children showed a significant simple effect of question type, $F(1, 78) = 9.33$, $p < .001$, giving more such justifications for fact questions than for opinion questions. Similarly, for justifications referring to the validity of different opinions, there were significant main effects of question type, $F(1, 78) = 53.59$, $p < .001$, $\eta^2 = .41$, and age group, $F(2, 78) = 11.75$, $p < .001$, $\eta^2 = .23$, but these were qualified by an interaction between question type and age group, $F(2, 78) = 17.43$, $p < .001$, $\eta^2 = .31$. Only the middle and oldest age group showed significant simple effects of question type, $F(1, 78) = 24.07$, $p < .001$, and $F(1, 78) = 54.07$, $p < .001$, respectively, giving more such justifications for opinion questions than for fact questions. Finally, there was a main effect of age group on residual justifications, $F(2, 78) = 3.06$, $p = .05$, $\eta^2 = .07$, with such justifications declining with age.

Discussion

This experiment provides further evidence for the claims made earlier, namely, that children from a young age display an implicit awareness of the distinction between matters of fact and opinion, but that the explicit recognition of the subjectivity of judgments about matters of opinion rises with age. Even when faced with the discrepant view of an expert in the matter at hand, children as young as 6 years of age were considerably less likely to change their response on questions about matters of opinion in comparison with questions about matters of fact. Importantly, this effect was significant even after controlling for the initial ratings of confidence in the initial answers given, as well as the overall levels of ambiguity across the fact and across the opinion tasks (as indicated by the number of times children selected the modal response).

Interestingly, follow-up analysis showed that children did not turn to experts' judgments for guidance even when they felt unsure about their own answers to questions about opinions: No association between confidence and conformity was found for these questions. On the other hand, children did use experts' judgments as a valuable informational source on judgments about factual matters, especially when they felt uncertain about their responses.

Table 3
Mean (SD) Number of Each Type of Justification Provided by Each Age Group for Why One of Two Answers Must or Need Not Be Wrong, by Question Type (Experiment 2)

	Expert judgment		Own judgment		Stimuli are the same		Stimuli are different		Validity of opinions		Residual	
Age group	Fact	Opinion	Fact	Opinion	Fact	Opinion	Fact	Opinion	Fact	Opinion	Fact	Opinion
6 years	0.44 (0.80)	0.44 (0.80)	1.15 (1.06)	1.04 (1.06)	0.44 (0.89)	0.37 (0.74)	0.19 (0.48)	0.26 (0.59)	0.00 (0.00)	0.15 (0.60)	0.78 (1.09)	0.74 (1.10)
8 years	0.35 (0.80)	0.08 (0.27)	0.46 (0.90)	0.62 (0.94)	0.54 (0.76)	0.46 (0.71)	0.62 (0.90)	0.31 (0.55)	0.42 (0.90)	0.96 (1.15)	0.62 (0.90)	0.58 (0.81)
10 years	0.57 (1.07)	0.14 (0.45)	0.18 (0.48)	0.32 (0.72)	0.39 (0.69)	0.25 (0.59)	1.36 (1.16)	0.25 (0.52)	0.21 (0.63)	1.79 (1.23)	0.25 (0.52)	0.25 (0.52)
Total	0.46 (0.90)	0.22 (0.57)	0.59 (0.93)	0.65 (0.95)	0.46 (0.78)	0.36 (0.68)	0.73 (1.01)	0.27 (0.55)	0.21 (0.65)	0.98 (1.22)	0.54 (0.88)	0.52 (0.85)

Note. Expert judgment = reference to the earlier expert's judgment; Own judgment = statement of own judgment; Stimuli are the same = suggestion that there is no wrong answer because the stimuli are the same; Stimuli are different = suggestion that there is a wrong answer because the stimuli are different; Validity of opinions = reference to validity of different opinions; Residual = residual responses, including "don't know."

Correspondingly, when children did change their response on fact questions after receiving expert guidance, they felt significantly more confident in their new answer than they did in their first, uninformed answer. In contrast, the minority of children who did change responses on one or more opinion questions did not feel any more confident in their new opinion than in their initial one. It is important to acknowledge, however, that we used only a selection of judgment tasks and only fictional experts who could be assumed to have domain-specific knowledge about the stimuli. Thus, future research may fruitfully examine whether the differences in behavioral responses to experts, and associated confidence ratings, depend on the domain of judgment and on the identity and status of the expert. For example, perceptions of parents, teachers, and friends as epistemic authorities are known to vary across domains (e.g., good pastimes, friendship choices, science, etc.) and developmentally during childhood and adolescence (Raviv, Bar-Tal, Raviv, & Houminer, 1990; Bar-Tal, Raviv, Raviv, & Brosh, 1991). The extent to which these patterns are mirrored in children's behavioral responses to authority figures on different types of judgment matters (e.g., value judgments, persuasive arguments) is an important question for future research.

Nonetheless, the present data provide clear indications that children from a young age are certainly capable of distinguishing between the types of fact and opinion judgments presented to them here. Even those in the youngest age group were more likely to adhere to their opinions, compared with their factual beliefs, in the face of opposing experts' judgments. Yet, these children failed to comment explicitly on the subjectivity of opinions, suggesting that the epistemological knowledge demonstrated in their behavior was held at an implicit or procedural level. On the other hand, the children did in general justify their behavior on fact and opinion tasks in different ways, referring to aspects of the stimuli more for questions of opinion and referring to the expert's judgment more for questions of fact. This raises the intriguing possibility that children's procedural distinction between beliefs about facts and opinions is accompanied—or even explained—by particular forms of explicit epistemological reasoning, such as knowing who is the best authority on matters of fact and opinion. However, recent research has pointed to a developmental increase in explicit awareness of the self as the best authority on matters of opinion (Bar-Tal et al., 1991; Burton & Mitchell, 2003). This is consistent with our own data on the explicit task and with our observation that only the oldest children explicitly commented on the validity of their own opinions. Thus, the general tendencies to refer to the expert more on the fact tasks and to the stimuli more on the opinion tasks could simply reflect children's identification of the particular task features corresponding to their behavior; the justifications in themselves need not imply that the behavioral responses were underpinned by explicit reasoning about fact and opinion beliefs. These alternative interpretations have important implications for our view of young children's epistemological reasoning and deserve attention in future research.

Notwithstanding possible developmental continuities in justifications for behavior, as discussed above, we found clear age differences in direct comments on the nature of matters of fact and opinion. References to the validity of different subjective judgments were used as justification for maintaining selections on questions about matters of opinion only in the oldest age group. Furthermore, the middle and oldest groups—but not the youngest group—also offered such responses to the explicit questions about the existence of wrong answers, especially when explaining why there need not be a wrong answer on matters of opinion. Interestingly, the oldest children were also more likely to indicate the basis for objectivity in matters of fact by highlighting the fact that the stimuli are different so that one of two different answers must be wrong. In contrast, the youngest group did not show differentiation in their responses to the explicit questions regarding matters of fact and matters of opinion, even though their behavioral responses to the experts' judgments showed a clear differentiation between the very same sets of fact and opinion matters.

Importantly, the patterns of results regarding the implicit measure (conforming to expert judgments) and the explicit measure (saying that one of two different answers must be wrong) were preserved even after controlling for each other. In line with this, we found not only that many children never conformed to experts' judgments about opinion questions despite explicitly asserting that there are wrong answers to such questions, but also that some children did on occasion conform to the experts' opinions even when they explicitly denied the possibility of wrong answers. Thus, even though explicit understanding of the subjectivity of opinions was in general less evident in this age range than implicit awareness, we should not assume that the former develops solely out of the latter.

General Discussion

The results from the two experiments presented here shed new light on the epistemological development of children in primary school. It seems clear that relying solely on measuring abstract, metacognitive, verbal reflections on differing beliefs as right or wrong or having degrees of rightness will not capture the implicit awareness of the distinction between factual beliefs and opinions that young children exhibit in their responses to others' judgments. In Experiment 1, 8- to 9-year-olds showed a clear tendency to conform to peer responses on a question regarding ambiguous fact substantially more than they did on a judgment about a matter of opinion, even though they often could not explicitly reflect on the subjectivity of differing opinions. In Experiment 2, a developmental increase in explicit understanding of the fact–opinion distinction was found to mask a stable ability, present from 6 years of age, to differentiate between judgments about facts and judgments about opinion: Even the youngest children in the sample were more likely to change their judgment to match that of an expert when the question at hand concerned a factual matter than when it concerned a matter of aesthetic preference or taste.

These findings suggest that children are able to treat matters of personal taste and aesthetic preference in a relativist/multiplist way but at the same time view simple matters of fact in an absolutist way, even if they cannot reflect on this distinction explicitly. The results complement and add detail to the findings of Wainryb et al. (2004) and Kuhn et al. (2000), demonstrating that relativist thinking is likely to be in place for some domains of belief fairly early in primary school. Indeed, they add considerable credence to Wainryb et al.'s (2004, p. 698) claim that "a generalized objectivist position across domains of knowledge would . . . be highly unlikely even among 5-year-olds." However, it remains an important task for future research to determine how children respond to matters that are likely to involve both objective and subjective

elements (e.g., complex factual questions about which children are likely to have informed opinions).

Importantly, the results from the implicit measure used here suggest that the relativism adopted by the children is selectively applied to the domain of opinions, preferences, and tastes. Children appear to deal with the ambiguity of some factual matters while still grasping the essential objectivity of those matters, and this evidence adds to our understanding of the working distinction between facts and opinions held during middle childhood and preadolescence (Chandler et al., 1990). The developmental processes involved in this general pattern, however, clearly demand further attention. Intriguing possibilities are suggested by the data from our middle age group in Experiment 2. Whereas these 8- to 9-year-olds maintained their implicit differentiation of fact and opinion judgments, their explicit responses indicated uncertainty about both the subjectivity of subjective judgments and the objectivity of objective judgments, with responses to both judgments no different from chance levels. The existence of this wavering in explicit knowledge about the domain generality of relativist thinking, alongside developmental stability in the children's differentiated responses to fact and opinion beliefs, raises critical questions about the developmental link between implicit and explicit knowledge. In particular, if explicit knowledge is a "redescription" of implicit, procedural knowledge (Karmiloff-Smith, 1992), then we would expect explicit recognition of the subjectivity of opinions to increase with age, but we would not expect any decrement in the knowledge about objectivity (which is already in place—explicitly—in the youngest group).

As noted earlier, Dienes and Perner's (1999) discussion of implicit and explicit knowledge presents evidence in favor of a dissociation in competing knowledge bases (e.g., underlying nondeclarative and declarative false-belief understanding). Similarly, there is evidence that preschoolers' difficulties with explicit reflection on the sources of beliefs are dissociated from their more sophisticated implicit evaluation of sources, as shown by differentiated suggestibility to statements about an object's identity from a better informed versus less informed experimenter (Robinson & Whitcombe, 2003). In the present context, we suggest that developmental changes in responses to our explicit questions need not be conceived solely as a gradual increase in the ability to verbalize what is already known implicitly. Children's explicit responses at different ages could indicate changing assumptions about when "the truth" can be found (e.g., moving from an initial "always, for all matters" to "maybe not, for any matter," to "yes, but only for matters of fact"). Critically, these assumptions may be dissociated from the children's implicit, procedural awareness of the distinction between factual judgments and opinions, which our studies indicate is present in children as young as 6 years of age. Only in the oldest age groups do the two coincide, such that 10-year-olds can reflect explicitly on the subjectivity of opinions. As Wainryb et al. (2004, p. 702) put it, "the developmental task faced by children is to learn to recognize the features that distinguish among different types of differences." One possibility is that children's progress in this developmental task allows explicit knowledge to catch up with—rather than be driven entirely by—the implicit knowledge that they already demonstrate in their behavior. Clearly, further work, utilizing more wide-ranging sets of judgment tasks, must seek to clarify the nature of, and developmental relations between, the implicit and explicit knowledge revealed in our investigations.

It is important to stress that the differentiation between facts and opinions in this study marks an early step in a long journey of epistemological development for the children in our sample. Considerable research documents the many changes in epistemological beliefs that occur through the lifespan, which vary according to context, experience, and domain (Hofer & Pintrich, 1997; Kuhn et al., 2000), and future work must assess the links between these changes and the understanding displayed by the children in this study. First, the understanding of beliefs about ambiguous stimuli clearly undergoes development during middle childhood (Beck & Robinson, 2001; Carpendale & Chandler, 1996), and work has suggested that explicit reasoning about the existence of "truth" and the possibility of resolving disagreements over facts versus preferences continues to mature into adolescence (Rowley & Robinson, in press). Even in the reasoning of adults, normative considerations may sometimes be found to outweigh the importance of idiosyncratic preferences (Meerum Terwogt & Rieffe, 2003). Our findings of developmental changes in explicit reasoning about objective and subjective judgments are consistent with this evidence, yet further work is needed to elucidate the underlying processes (which may include broader cognitive developmental patterns as well as issues connected with identity; Chandler et al., 1990) responsible for these pathways.

Second, the understanding that some matters are dependent on subjective preferences that are neither right nor wrong represents only one progression of several in the understanding of subjectivity. As Kuhn et al. (2000) demonstrate, relativist positions themselves can be overtaken by evaluativist approaches that integrate objective and subjective dimensions. We noted earlier that our beliefs about many "facts" may sometimes be influenced by personal preference and that the opinions we hold may sometimes relate to objective characteristics. For example, two different opinions can both be seen as legitimate and "right," but their merits can be weighed on the basis of evidence and other external criteria. Indeed, Robinson and Apperly (1998) presented evidence that adolescents are different from adults in their failure to see such an objective dimension as a basis for resolving scientific disputes. Importantly, the present results raise the possibility of a dissociation between individuals' metacognitive reflections on different types of dispute and the implicit epistemological beliefs they may exhibit in their behavior when personally responding to such disputes themselves. Thus, the challenge facing researchers is both to track the development of epistemological beliefs through childhood, adolescence, and beyond at both explicit and implicit levels, and then to determine how the individuals' explicit reasoning about different beliefs is connected to the behavioral indicators of their implicit epistemologies.

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Appendix

Tasks and Questions in Experiment 2

Sample Judgment Task in Experiment 2

1. Present photographs of three desserts (labeled A, B, and C).
   a. Opinion task: Which one is the most tasty? Fact task: Which one takes the longest to bake?
   b. How sure are you about your answer? (*not sure at all, a bit sure, quite sure, very sure*)
   c. We asked this question to Peter, who is a baker and spends a lot of time making different kinds of puddings. He said . . . You had said . . . Do you want to change your answer now or do you still think . . .?
   d. How sure are you about this answer? (*not sure at all, a bit sure, quite sure, very sure*)
   e. Why did your answer change/stay the same?
   f. Imagine if Tom said X and John said Y. Would one of them have to be wrong? Why or why not?

Content of Other Judgment Tasks in Experiment 2

1. Three houses: Which one is the nicest? (opinion) or Which one is the most expensive? (fact); expert judgment provided by estate agent.
2. Three dogs: Which one is the friendliest? (opinion) or Which one is the oldest? (fact); expert judgment provided by vet.
3. Three toys: Which one would be the most fun to play with? (opinion) or Which one is bought by the most people? (fact); expert judgment provided by owner of toy shops.

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