Knowing Better: The Role of Prior Knowledge and Culture in Trust in Testimony

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This article examined the ability of young children to adapt their trust in testimony in relation to the strength of their prior knowledge across 2 cultures and 2 age groups. Kindergartners and second graders in the United States and Hong Kong (N = 128) viewed pictures of objects and made category judgments about each object: first, in the presence of a teacher who provided labels that conflicted with their prior knowledge, and again, in a pedagogical scenario, when told they were passing the information on to younger learners in the teacher’s absence. Results showed that children endorsed more conflicting labels when they had weak (as opposed to strong) prior knowledge about the objects. This effect of knowledge strength was robust across cultures and stronger in the older children. Surprisingly, relative to their Chinese peers, American kindergartners were more willing to endorse conflicting labels when they had strong prior knowledge about the objects. Findings are discussed with respect to the ways in which children are socialized to learn from others across the early primary school years in these 2 very different cultures.

Keywords: epistemic trust, prior knowledge, culture, learning, Chinese
the work that has been done, the methodology used to test them, and the predictions that guided our investigation.

**Question One: Does the Strength of Prior Knowledge Influence Children’s Trust in Conflicting Testimony?**

In the context of conflicting testimony, indicators of trustworthiness can help a child assess whether an informant is well-informed and well-intentioned. In a number of studies, children were asked to locate (e.g., in a certain box) or identify the properties (e.g., red, furry) of a hidden object while an adult provided testimony that conflicted with what children had themselves perceived (Clément, Koenig, & Harris, 2004; Ganea & Harris, 2010; Ma & Ganea, 2007; Robinson, Haigh, & Nurmsoo, 2008; Robinson & Whitcombe, 2003). By age 4, children can respond flexibly, accepting conflicting testimony when the informant’s perceptual access Trumps their own and adhering to their own beliefs when the informant has no or limited perceptual access.

However, when children have no relevant knowledge of their own, they show a bias to trust in testimony from other people, including even ill-intentioned strangers. In several studies, children searched for a hidden object under the guidance of an informant who had a history of providing misleading testimony (with or without overtly ill intentions). Three-year-olds tended to give the informant the benefit of the doubt, though the evidence is mixed as to whether this bias to trust is due to poor inhibitory control or social cognitive attributions (Jaswal, Croft, Setia, & Cole, 2010; Mascaró & Sperber, 2009; Vanderbilt et al., 2011).

In everyday contexts, however, and in particular for young children, conflicting testimony often comes from trusted caregivers (e.g., teachers) who are both well informed and well intentioned. Furthermore, whereas conflicting testimony may be about situation-specific facts such as the location or properties of a particular item (i.e., facts that children could not have known before the experiment), it more often concerns the evolving set of concepts (e.g., what a duck is) and theories (e.g., unsupported objects fall) that children bring to the task. To the extent that testimony concerns prior knowledge, the strength of prior knowledge can affect a person’s willingness to accept conflicting testimony.

Past research has examined children’s willingness to learn from adult testimony that conflicts with their working concepts and theories. For example, researchers have found that testimony can override gravity bias—the tendency for 2- and 3-year-olds to expect objects to always fall in a straight line (Bascandziev & Harris, 2010; Jaswal, 2010; Joh, Jaswal, & Keen, 2011). In one study, when locating a ball that fell through an opaque S-shaped tube, children showed a gravity bias in some conditions but not others. Specifically, the negative feedback of past failures was not enough to override the bias, as shown by children’s persistence to search directly below the place where the ball was dropped. In contrast, children readily accepted testimony that conflicted with their gravity bias whenever testimony was provided (Jaswal, 2010, Study 1).

In another line of research exploring the impact of testimony on inductive inferences, children were shown hybrid stimuli that contained perceptual features associated with two different categories but looked more representative of one category than the other (e.g., a cup–hat that looks more like a cup; Jaswal, 2004; 2007; Jaswal & Markman, 2007). In the absence of testimony, 4-year-olds made perceptually based inferences about hybrid stimuli almost all of the time. However, when the same hybrids received labels that conflicted with perceptual cues (e.g., the cup–hat labeled as “a hat”), 4-year-olds were more likely than would have been expected by chance to make label-based inferences (e.g., “the cup–hat is something you wear on your head”). Again, the findings reveal children’s readiness to endorse conflicting testimony for material that involves a degree of ambiguity.

However, whether children might tune their endorsement of conflicting labels to items of varying ambiguity is an open question that has not been directly addressed. Put differently, are children more likely to endorse a conflicting label for a hybrid object that appears to be closer to one category than another, an ambiguous object that appears to be equally associated with two categories, or a prototypical object that clearly and unquestionably belongs to a particular category?

In the present study, children made category judgments about objects that were labeled by a confederate teacher in ways that conflicted with their prior knowledge. The social category of the informant was standardized to draw upon the well-intentioned and well-informed attributes commonly associated with teachers. Children were assigned to one of two groups: a weak prior knowledge condition, in which category judgments were made about ambiguous objects, and a strong prior knowledge condition, in which category judgments were made about prototypical objects. We then compared the tendency for children to endorse conflicting labels in their subsequent category judgments across the two conditions.

Overall, children were predicted to endorse more conflicting labels when their prior knowledge was weak than when their prior knowledge was strong. Support for this prediction comes from the implicit role of prior knowledge in enabling children to attribute (in)accuracy to speakers in selective trust paradigms (e.g., Koenig et al., 2004) and, more specifically, from studies that reveal a quantitative aspect in children’s attempts to tune their trust behavior to minimize error (Corriveau et al., 2009; Einav & Robinson, 2010). In one study, children preferred to trust their mother instead of a stranger for the label of an ambiguous item that was consistent with either label. For a hybrid item that favored the stranger’s label, however, 5-year-olds overrode their initial preferences and followed the stranger’s claim over that of their mother (Corriveau et al., 2009). The results suggest that children actively compare other people’s testimony to their own working knowledge. When their own intuitions are weak, children turn to the people whom they trust by default. In contrast, when their own intuitions are strong, children are able to suspend their preferences even for a trusted informant if this informant is providing conflicting testimony. Our study directly examined this possibility, with children hypothesized as being more likely to endorse a teacher’s conflicting labels for ambiguous objects than for prototypical objects.

**Question Two: Does the Effect of Knowledge Strength Differ by Culture or by Age?**

As cultural and cross-cultural psychologists have demonstrated, human behavior and development, including the act of learning, are situated in sociocultural contexts (e.g., Rogoff, 1993; Vygotsky, 1978). In this view, children are active and constructive
agents in their own learning while being both recipients and contributors to socialization and cultural forces (Munroe & Gauvain, 2010; Nelson, 2007). Likewise, children’s tendency to trust in conflicting testimony is influenced by socially shaped experiences related to learning and culturally shaped beliefs about what it means to be a learner. To address this idea, we compared the effect of knowledge strength on trust across children attending school in the United States versus in Hong Kong, with location as a proxy to the differences in children’s sociocultural experiences.

Comparisons of learning-related experiences and beliefs between Western and Chinese students have been well documented. In terms of learning-related experiences, the literature suggests that formal learning experiences in Chinese cultures tend to be more teacher centered, compared with those in Western cultures. For example, whereas discussion and questioning are embraced in North America as key to successful learning, students in Hong Kong (more so than their Western counterparts) tend to perceive the teacher as a highly authoritative source of knowledge and their own understanding of the teacher’s presentation as a prerequisite for questioning (Pratt, Kelly, & Wong, 1999). In terms of early education, despite efforts at the policy level to advocate a more child-centered, active learning approach to education, actual practice has been constrained by resource limitations (time, space, and staff), the persistence of traditional values, and parental demands for achievement (Luk-Fong, 2005). As a result, the reality of the preschool classroom remains one in which children are ushered through learning activities on a fast-paced schedule, classroom rules are enforced in a managerial style, and teaching concerns the didactic transmission of knowledge to achieve a tangible product based on the teacher’s agenda (Lee, 2002; Y. L. Li, 2003, 2004, 2006). Though some may argue that a similar tension occurs in the United States, the emphasis in U.S. education on nurturing independent and intrinsically motivated learners has allowed American preschools to be much more child centered than those in Hong Kong. For example, whereas choice is a salient feature in the experiences of American preschoolers (Tobin, Hsueh, & Karasawa, 2009), it is rare among Hong Kong preschoolers, who participate in most activities as a class with as many as 30 children, one or two teachers, and no parent or student helpers.

The disparities found in American and Chinese children’s learning experiences are supported by similar contrasts in learning-related beliefs. In North America, beliefs about learning tend to emphasize the mind, with active engagement, inquiry, and communication as core processes that enable an individual to develop expertise in a field and to arrive at creative personal insights (J. Li, 2005; J. Li & Fischer, 2004). Such beliefs align with a Socratic approach to learning, in which learners are encouraged to question their own and others’ beliefs and to generate their own hypotheses (Tweed & Lehman, 2002). In Chinese cultures, beliefs about learning tend to have a “virtue orientation” (associated with Confucian teachings), with the training of resolve, diligence, endurance of hardship, perseverance, and concentration as core processes that enable a person to acquire and apply knowledge for moral and practical reasons (J. Li, 2005; J. Li & Fischer, 2004). Learners are expected to listen attentively and to question only after they have understood others, with an attitude of humility, respect, and obedience toward their teachers (J. Li & Fischer, 2007), who are seen as moral examples and sources of authorized knowledge (Chan & Elliott, 2004; Pratt et al., 1999).

Based on the differences in learning-related experiences and learning-related beliefs previously described, we expected Chinese children’s tendency to trust in conflicting testimony to be more strongly driven by deference to the teacher. Whereas children in both cultures were predicted to demonstrate an effect of knowledge strength, that is, to endorse more conflicting labels in light of weak, relative to strong, prior knowledge, American children were expected to endorse fewer labels (adhering to their own opinions more frequently) than Chinese children (deferring to the informant–teacher more frequently). Also, taking into account American preschoolers’ readiness to endorse conflicting testimony when there was some degree of ambiguity (Jaswal, 2004), we expected differences across cultures to be less pronounced when prior knowledge is weak.

We conducted the study with children in kindergarten and second grade so that we could also examine the stability of the cross-cultural similarities and differences in relation to development. We used kindergartners as our younger group because the clearest evidence of error-minimizing behavior (or a quantitative aspect of trust) came from 5- to 7-year-olds (Corriveau & Harris, 2009; Einav & Robinson, 2010). Given advancing metacognitive skills with age (Kreutzer, Leonard, & Flavell, 1975; Markman, 1979; Mills & Keil, 2004; Wellman, 1977), second graders were expected to be more sensitive to the strength of their own knowledge and to be more flexible in adapting their trust to conflicting testimony. At the same time, because culture-specific beliefs about learning tend to become more articulate with age and are reinforced by formal schooling (J. Li, 2001, 2002, 2005), we expected that the cross-cultural differences between American and Chinese children’s trust in conflicting testimony would be more pronounced at second grade.

Finally, we explored whether children who endorsed conflicting labels considered the labels as potentially true or if they were merely complying with the suggestions of a physically present adult (Jaswal, Lima, & Small, 2009). As described in the next section, we presented the category judgment task in a cover story that emphasized the child’s own role as a potential informant to increase the perceived stakes of the children’s responses. Specifically, the task was introduced as a novel computer game, and children were asked for to help teach younger children about those categories by first practicing and then demonstrating the game. Because the teacher who provided the conflicting labels was present in the room during the practice phase only, we examined whether children who endorsed conflicting labels in an informant’s presence still did so when demonstrating category judgments to younger learners and in the absence of the informant. In this way, the features of the task allowed us to take an exploratory look at the extent of compliance in children’s trust in conflicting testimony.

1 Hong Kong is considered an appropriate choice for a cross-cultural comparison with the United States, given similarities in terms of family structure (being exempt from the one-child policy) and overall lifestyle (relatively Westernized due to its colonial history). Taken together with the finding that traditional Chinese values have remained robust in everyday and academic interactions (J. Li & Fischer, 2007; Y. L. Li, 2006), using participants from Hong Kong allowed us to examine cultural effects in the absence of some of the rapid social, economic, and family structure changes that have occurred in mainland China.
Method

Participants

Participants were 128 children attending kindergarten and second grade in the United States and in Hong Kong. The U.S. participants were 32 kindergartners (M = 6 years 0 months, SD = 0 years 4 months; 16 boys and 16 girls) and 32 second graders (M = 8 years 1 month; 17 boys and 15 girls) from five elementary schools in southeast Michigan. In Hong Kong, participants were 32 kindergartners (M = 5 years 4 months; 14 boys and 18 girls) and 32 second graders (M = 7 years 8 months; 15 boys and 17 girls) from four kindergartens and three primary schools. At both grades, the American participants were, on average, a few months older than their Chinese counterparts (ps < .001) due to constraints with recruitment and training. We address the implications of these differences in the discussion.

All children received written consent from their parents prior to participation. Information on ethnicity collected from parental questionnaires showed that 96% of the American children were White and 100% of the Hong Kong children were of Chinese descent. As an indicator of socioeconomic status, the average home size was 2,391 square feet for participants in the United States and 524 square feet for participants in Hong Kong; both numbers were comparable to published averages for the communities from census data (U.S. Census Bureau, 2009) and governmental reports (Hong Kong Housing Authority, 2010).

Materials

An interactive game was created with E-Prime Version 2.0 (Psychology Software Tools, Sharpsburg, PA) on a T42 laptop computer (IBM Corp., Armonk, NY) fitted with a touch screen (KeyTec Inc., Garland, TX), which was used to present digital images of everyday objects (edited to 158 pixels by 158 pixels in Photoshop [Adobe Systems Inc., San Jose, CA]). Stimulus images appeared, one at a time, in the top half of the screen. Participants responded by touching one of two response images that appeared in the bottom half of the screen (Figure 1).

Each participant viewed a total of 12 stimulus images and eight response images, which were chosen based on a pilot procedure in which adults (N = 72) and preschoolers (N = 42) were asked to identify and make category judgments about a larger pool of images. Four images of prototypical objects and four images of ambiguous objects were used in key trials involving conflicting testimony (see Appendix). Relative to the ambiguous objects, the prototypical objects were rated by adults using a Likert-type scale as being more easily identifiable (U.S. Mprototypical = 3.35, Chinese Mprototypical = 3.32), were correctly identified by more preschoolers (89% of American sample and 86% in Chinese sample for prototypical objects vs. 11% of American sample and 27% of Chinese sample for ambiguous objects), and elicited greater consensus among preschoolers regarding their identity (86% of the American sample and 81% of the Chinese sample for prototypical objects vs. 61% of the American sample and 53% of the Chinese sample for ambiguous objects).

Procedure

Participants interacted individually with two researchers in a quiet classroom at their school. To minimize the demand characteristics of the experiment, the session was designed to be as naturalistic and continuous as possible with the school context.

Picture book activity: Probing prior knowledge. First, the participant looked at a picture book with the researcher. On each page, the participant saw a single image (A) of an object and was asked to name its identity (“What is this?”). Next, the researcher lifted a flap at the bottom of the page to reveal two other images (B1 and B2) and asked the participant to make a category judgment about A by indicating whether A went with B1 or B2 (e.g., “Is it a part of? The car or the jacket?”) If the participant replied, “I don’t know” on the naming question, the researcher replied “Okay!” and moved on. However, if the participant replied, “I don’t know” or “Both” on the category judgment question, the researcher encouraged the participant to take a guess. The same protocol was repeated for each page of the book. Participants’ answers were recorded on a data collection sheet that was hidden behind the laptop computer for later reference.

One purpose of the picture book was to help participants feel comfortable with the researcher. Second, and more important, the picture book presented the stimulus images used in the computer game. Therefore, the activity allowed us to probe and record participants’ prior knowledge, in particular, for the ambiguous stimulus images, given that this knowledge was likely to vary across individuals.

Computer game: Teaching younger learners. Next, the participant’s attention was drawn toward the laptop computer. At this moment, a confederate (known hereafter as the “teacher”) entered the room carrying some work. The researcher showed surprise and

Figure 1. Each participant played a category judgment game on a touch screen computer in the scripted presence and absence of a researcher (R) and a confederate teacher (T). Box 2 shows T calling a button “a wheel” in the strong prior knowledge condition.
asked the teacher if it was okay to share the space. The teacher agreed and, during the brief and casual exchange, was introduced as “a teacher visiting from another school” who happened to teach children of the same age as the participant. After this exchange, which established the confederate’s social identity as a teacher, the teacher returned to her own work. Because the sessions took place in a classroom during school hours, this type of interaction among children, teachers, and visitors was common and coherent with the children’s overall experience of the school day.

Next, participants were asked to practice playing a computer game so that they could “help [the researcher] make a video that teaches younger children about different kinds of things and what they are used for.” Participants were then guided to make category judgments (by touching one out of two response items) for three stimulus images shown consecutively: a fish (tree vs. water), a key (door vs. book), and a candle (cake vs. pillow). Then, children saw the same images again (fish, key, candle), but this time their hand motions were videotaped “to teach younger children about those three things.” To emphasize the children’s pedagogical role, participants were invited to review the recording and praised for their help.

Then, the researcher announced that there were four more rounds in the game and that she had to find a new recorder for the next round. Before exiting the room, the researcher asked if the teacher could accompany the child while the child practiced that specific round (containing three items) once (Figure 1, Box 1). After the researcher had left (Figure 1, Box 2), the teacher repeated a set of scripted instructions corresponding to the stimulus images on the touch screen (e.g., “In this round, you need to match the buttons with the jacket, and the wheels with the car”). At the appearance of each stimulus image, the teacher asked, “Where do you think this ______ goes?” while fixing her gaze on the object to minimize social cues. Regardless of the participant’s response, the teacher acknowledged the response neutrally (e.g., “With the jacket, okay!”).

When the researcher returned with a new recorder, the teacher briefly returned to her work and left the room (Figure 1, Box 3). In the teacher’s absence, the participant played the same round again (in a pedagogical stance) with his or her hand motions video recorded (Figure 1, Box 4). Afterward, the researcher indicated her need to find another new recorder, and the whole sequence of events was repeated for another three rounds. The order in which the stimulus images were presented and the left versus the right location of the response images on the screen were counterbalanced across participants and trials, respectively.

**Strong Versus Weak Prior Knowledge Conditions**

In each round (there were four in total), participants made category judgments about three stimulus images. The first two images were prototypical exemplars that always received labels consistent with participants’ prior knowledge. For example, a button was labeled a “button,” and a wheel was labeled a “wheel.” In contrast, the third and critical image received labels that conflicted with participants’ prior knowledge. For example, for an image perceived as a button by the majority of pilot subjects, the teacher asked, “Where do you think this wheel goes?” In the weak prior knowledge condition, ambiguous stimulus images were presented. The teacher then surreptitiously glanced at a hidden data sheet (which contained codes representing each child’s category judgments for the images in the picture book activity) and provided a label that conflicted with the participant’s prior knowledge.

**Results**

For the main analyses, the dependent variable was label endorsement, that is, the number of labels that participants endorsed in his or her category judgments. In each session, the teacher provided four conflicting labels in total. Thus, the value of the dependent variable ranged from 0 to 4 (Table 1). Because the dependent variable did not follow a normal distribution or meet the assumption of homogeneity of variance required for parametric tests, we performed a series of ordinal logistic regressions (OLRs) to test our hypotheses. Compared with parametric tests, OLRs tend to be less powerful in detecting significant effects. At the same time, OLRs do not assume normality and homogeneity of variance across groups and, therefore, provide a more valid model that better fits our current data. The OLRs were performed using generalized linear models in SPSS 20, which enabled the testing of main effects and interactions via the Wald test statistic.

**Question One: Does the Strength of Prior Knowledge Influence Children’s Trust in Conflicting Testimony?**

We explored the full model of effects and interactions in relation to our two research questions via an OLR on label endorsement with three between-subjects predictors: strength of prior knowledge (weak vs. strong), culture (United States vs. Hong Kong), and age (kindergarten vs. second grade). We found a main effect of knowledge strength, Wald $\chi^2(1) = 49.84, p < .001$, with participants endorsing more of the teacher’s labels in the weak prior knowledge condition ($M_{weak} = 3.17, SD = 1.08$) than in the strong

| Table 1 |
|-----------------|----------|----------|-------|
| **Number of Participants Who Endorsed 0–1 Versus 2–4 Labels** |
|  | Kindergarten |  |  |
|  | U.S. |  |  |
|  | Strong | 4 | 12 | 16 |
|  | Weak | 0 | 16 | 16 |
|  | Chinese |  |  |  |
|  | Strong | 11 | 5 | 16 |
|  | Weak | 1 | 15 | 16 |
|  | Second grade |  |  |  |
|  | U.S. |  |  |  |
|  | Strong | 13 | 3 | 16 |
|  | Weak | 2 | 14 | 16 |
|  | Chinese |  |  |  |
|  | Strong | 15 | 1 | 16 |
|  | Weak | 3 | 13 | 16 |
prior knowledge condition ($M_{\text{strong}} = 1.20$, $SD = 1.49$). Consistent with our prediction, when participants felt less certain about an object’s category, they were more likely to endorse an alternative provided by the teacher.

The effect of knowledge strength was robust across cultures, as indicated by the absence of an interaction between knowledge strength and culture, Wald $\chi^2(1) = .80$, $p = .37$. Nonparametric tests confirmed that participants in both cultures endorsed significantly more labels in the weak prior knowledge condition than in the strong prior knowledge condition (U.S. $M_{\text{weak}} = 3.38$ vs. $M_{\text{strong}} = 1.63$, Mann–Whitney $U = 224.0$, $N = 64$, $p < .001$; Hong Kong $M_{\text{weak}} = 2.97$ vs. $M_{\text{strong}} = .78$, Mann–Whitney $U = 120.5$, $N = 64$, $p < .001$).

**Question Two: Does the Effect of Knowledge Strength Differ by Culture and Age?**

Similarly consistent with our predictions, we found a Knowledge Strength $\times$ Age interaction, Wald $\chi^2(1) = 8.27$, $p = .004$, indicating that the effect of knowledge strength differed across kindergartners and second graders. Further analysis revealed that although participants at both ages endorsed more labels in the weak prior knowledge condition than in the strong prior knowledge condition, the effect of knowledge strength was larger in the older ($M_{\text{weak}} = 2.94$ vs. $M_{\text{strong}} = .44$, Mann–Whitney $U = 72.50$, $N = 64$, $p < .001$) compared with the younger group ($M_{\text{weak}} = 3.41$ vs. $M_{\text{strong}} = 1.97$, Mann–Whitney $U = 252.0$, $N = 64$, $p < .001$). Compared with the kindergartners, the second graders more clearly discriminated between situations where they should revise their beliefs to accept a new alternative and situations where they should adhere to their own knowledge. Alternatively, one might argue that the age effect was due to knowledge differences between kindergartners and second graders. However, this is unlikely given that the effect was predominantly carried by age-related differences in the strong prior knowledge condition, which contained items that were so straightforward that not only kindergartners but also preschoolers in the pilot phase were able to provide prototypical labels with no hesitation.

Next, we found a main effect of culture, Wald $\chi^2(1) = 7.04$, $p = .008$, with the group means indicating that American participants endorsed more labels overall than did their Chinese peers, and a main effect of age, Wald $\chi^2(1) = 19.85$, $p < .001$, indicating that the kindergartners endorsed more labels overall than did the second graders. These main effects were interpreted in light of a significant three-way interaction of knowledge strength, culture, and age, Wald $\chi^2(2) = 6.10$, $p = .047$.

A closer look at the data shows that the effect of knowledge strength differed between the American and Chinese participants, but only among the kindergartners (Figure 2), with the effect of knowledge strength being significant among the Chinese kindergartners (Mann–Whitney $U = 24.50$, $N = 32$, $p < .001$) but not among the American kindergartners (Mann–Whitney $U = 104.4$, $N = 32$, $p = .33$). Though kindergartners in both cultures endorsed almost all of the conflicting labels in the weak prior knowledge condition (U.S. $M_{\text{weak}} = 3.50$ vs. Hong Kong $M_{\text{weak}} = 3.31$), they responded differently in the strong prior knowledge condition, with American kindergartners endorsing more labels than would have been expected by chance ($Mdn_{\text{strong}} = 3.50$, Wilcoxon $Z = 93.0$, $p = .051$) and Chinese kindergartners endorsing fewer labels than would have been expected by chance ($Mdn_{\text{strong}} = 1.00$, Wilcoxon $Z = 13.5$, $p = .012$).

In contrast, the effect of knowledge strength was similar across American (Mann–Whitney $U = 10.00$, $N = 32$, $p < .001$) and Chinese (Mann–Whitney $U = 25.50$, $N = 32$, $p < .001$) second graders. These patterns were further confirmed when we looked at the Knowledge Strength $\times$ Culture interaction at each age separately, whereas the interaction was significant among the kindergartners, Wald $\chi^2(1) = 5.68$, $p = .017$, it was not significant among the second graders, Wald $\chi^2(1) = 0.791$, $p = .374$. By second grade, American and Chinese children performed quite similarly, endorsing more labels than would have been expected by chance when prior knowledge was weak (U.S.: $Mdn_{\text{weak}} = 4.00$, Wilcoxon $Z = 100.00$, $p = .002$; Hong Kong: $Mdn_{\text{weak}} = 3.00$, Wilcoxon $Z = 61.50$, $p = .070$) and endorsing virtually no labels when they had strong prior knowledge (U.S.: $Mdn_{\text{strong}} = 0.00$, Wilcoxon $Z = 0.00$, $p < .001$; Hong Kong: $Mdn_{\text{strong}} = 0.00$, Wilcoxon $Z = 10.00$, $p = .001$).

Though we had expected to observe cultural differences, we were surprised to find the cultural differences run in the opposite direction to our predictions. In particular, although the literature on learning styles suggested that Chinese learners (compared with American learners) would show greater deference to the instructions of their teachers, the reverse pattern was found. More intriguingly, the cultural differences were found at an earlier, rather than later, developmental stage, that is, before the commencement of formal schooling.

**Exploring the Extent of Social Compliance**

In a separate analysis, we explored the extent of compliance by looking at the number of conflicting labels endorsed when participants demonstrated their category judgments to younger learners in the teacher’s absence. Contingency tables were used to depict label endorsement in the teacher’s absence versus in the teacher’s presence. Each participant responded to four conflicting labels, resulting in 512 total response “instances” for the entire sample (collapsed across culture and age).

There were four possible scenarios. The most straightforward scenarios occurred when endorsement (or the lack thereof) was
consistent, that is, participants either endorsed or rejected a label and did the same thing in both the presence and absence of the teacher. This scenario represented the majority, or 471, of the 512 instances (92%). The scenario that was hardest to interpret occurred when a label was rejected in the teacher’s presence but later endorsed in the teacher’s absence. Nonetheless, this scenario was rare and accounted for only seven of the 512 instances (1%).

The scenario suggestive of compliance occurred when a label was endorsed in the teacher’s presence but later rejected in the teacher’s absence. This was observed in 34 of the 512 instances (7%), with 25 instances in the strong prior knowledge condition (14 in the American sample and 11 in the Chinese sample) and nine instances in the weak prior knowledge condition (six in the American sample and three in the Chinese sample). In sum, response patterns associated with social compliance were observed among participants, albeit infrequently, and were more likely to occur in the strong prior knowledge condition than in the weak prior knowledge condition, \( \chi^2(1) = 7.09, N = 512, p = .008 \).

To examine the impact of social compliance on the overall findings, we conducted a three-way OLR with the dependent variable of label endorsement in the teacher’s absence. The model included the same predictors as before—the strength of prior knowledge (strong vs. weak; between subjects), culture (United States vs. Hong Kong; between subjects), and age (kindergarten vs. second grade; between subjects)—and yielded a very similar pattern of results. As with label endorsement in the teacher’s presence, we found a main effect of knowledge strength, Wald \( \chi^2(1) = 60.57, p < .001 \), that was robust across cultures, an interaction of knowledge strength and age, Wald \( \chi^2(1) = 7.43, p = .006 \), and main effects of culture, Wald \( \chi^2(1) = 3.17, p = .075 \), and age, Wald \( \chi^2(1) = 19.07, p < .001 \), that were interpreted in light of the three-way interaction of knowledge strength, culture, and age, Wald \( \chi^2(2) = 7.59, p = .02 \). Thus, the effect of prior knowledge strength on label endorsement in relation to culture and age showed the same pattern even when social compliance was taken into account.

**Discussion**

This study was the first to directly examine the effect of prior knowledge strength on children’s trust in testimony and to consider both cultural and developmental influences on this effect. As predicted, children endorsed more conflicting labels when their prior knowledge about the objects was weak (rather than strong), with the effect of knowledge strength being robust across cultures and stronger in the older children. Contrary to our predictions, American kindergartners in the strong prior knowledge condition were more willing than Chinese kindergartners to endorse conflicting labels. Similar cross-cultural differences were not observed among the second graders, suggesting a pattern of cultural convergence (as opposed to divergence) across development, which was also not predicted.

**What Are the Implications of the Prior Knowledge Effect?**

Findings suggest that children selectively learn from others, and they do so based not only on the external and internal attributes of the informant (e.g., past accuracy and intentions) but also on the working theories and concepts that children themselves bring to the learning event. The ability to factor the strength of prior knowledge into one’s trust in testimony offers a safeguard against erroneous information and, in particular, erroneous information from a usually (or apparently) well-informed and well-intentioned informant who has a momentary lapse in accuracy. Although we cannot tell from the data whether the consideration of knowledge strength is an implicit or explicit process for the children in our sample, the Knowledge Strength × Age interaction indicates that the role of prior knowledge increases with age and may be an important component in children’s development of metacognitive capacities.

Finally, the role that prior knowledge plays in selective trust paradigms deserves more explicit consideration. For example, it is prior knowledge that enables children (such as those in Einav & Robinson, 2010) to see Speaker A, who calls a penguin “a duck,” as committing a smaller error than Speaker B, who calls a penguin “a tambourine.” However, when Speakers A and B are presented in separate studies, the distinction tends to be masked or lost because both speakers would fall under the same category of “the inaccurate informant.” The masking of task attributes becomes an issue when multiple studies (each featuring a unique contrast) are considered in a meta-analysis or when attempting to resolve contradictory results across studies. For example, the reason for children to distinguish between accurate and inaccurate speakers in one study but not another may be explained by the inaccurate speaker in the former study being more “inaccurate” than the one in the latter.

**Why Were American Kindergartners More Trusting Than Chinese Kindergartners?**

We encountered two surprising findings in our data. First, when prior knowledge was strong, kindergartners in the United States endorsed more conflicting labels than kindergartners in Hong Kong. Second, the cross-cultural differences disappeared by second grade, showing cultural convergence rather than divergence. One possible explanation for the patterns found in the kindergartners might be that participants were not engaging with the task (following the teacher’s labels while disregarding the stimulus images) or the teacher (focusing on the stimuli while disregarding the teacher’s labels). This explanation is unlikely given the many spontaneous comments that kindergartners in both cultures made in response to the conflicting labels (e.g., “That’s a wheel?” “Are you sure?” “Those are actually socks”). The comments indicated that the participants were thoughtfully engaged with both the task and the informant.

Alternatively, it is possible that the strong willingness to trust in conflicting testimony observed by the American kindergartners might be specific to the classrooms and children sampled in the study. Although future replication is required to fully address this possibility, preliminary data from 4- to 5-year-old preschoolers in the United States (\( M_{\text{strong}} = 3.31 \) vs. \( M_{\text{weak}} = 2.75 \), Mann–Whitney \( U = 89.50, N = 32, p = .149 \)) have shown patterns that are consistent with those found in U.S. kindergartners (C. C. Y. Chan, 2011), suggesting that the relatively undifferentiated trust in conflicting testimony in American kindergartners may be robust and related to the “strong bias to trust” that has been observed in even younger children (Jaswal et al., 2010; Vanderbilt et al., 2011).
How, then, should these cross-cultural findings be interpreted in light of the socially and culturally shaped experiences and beliefs that make learning what it is in the United States and Hong Kong? One possible explanation relates to the advanced executive functioning that has been documented in Chinese children relative to their U.S. peers (Lewis et al., 2009; Sabbagh, Xu, Carlson, Moses, & Lee, 2006; Tardif, So, & Kaciroti, 2007). In a study looking at 3- to 5-year-olds’ executive functioning, Chinese children’s performance on inhibitory control tasks matched that of U.S. preschoolers who were on average 6 months older (Sabbagh et al., 2006). If we describe the current task in terms of inhibitory control, then the key challenge for participants would be to resist the urge to touch a labeled item when the label is incorrect. Based on this account, children with better inhibitory control would endorse fewer labels in the strong prior knowledge condition, on this account, children with better inhibitory control would endorse fewer labels in the strong prior knowledge condition, and the superior inhibitory control of Chinese kindergartners would account for our observed results.

However, an unintended aspect of the participant demographics in this study offers contradictory evidence for this account. As described in the Method section, for both age groups, the Chinese children were on average a few months younger than the U.S. children. This age difference might in fact offset the superior inhibitory control that Chinese children may have and make it less likely for executive functioning to be the main contributor to the cross-cultural patterns. In addition, the frequent spontaneous comments made in response to the conflicting testimony suggest that children were more thoughtful about the veracity of the testimony than an inhibitory control framework might predict. Nonetheless, because direct measures of executive functioning were not included in this study, this account awaits further investigation.

Given that neither deference to the teacher nor disparities in executive functioning seem to account for the findings, what else might drive the cross-cultural differences that we found in the present study? One possibility lies in the age-related convergence of the two cultures: by second grade, children in both cultures endorsed virtually none of the conflicting labels when they had strong intuitions about the objects, even though they were still willing to endorse labels from the teachers when their prior knowledge was weak. This pattern may reflect universal processes of cognitive development that make learning what it is in the United States and Hong Kong. Among parents of preschool children, Chinese parents (relative to American parents) emphasize a greater need for self-reliance in academic domains (Chao & Sue, 1996) and use more training routines to establish self-regulatory learning skills in their children (Ty & Schultenberg, 2005). Among elementary school students asked to report the most important factor for their academic success, American children focused on the availability of a good teacher, whereas Chinese children focused on effort and hard work (Stevenson, 1993). Furthermore, most kindergartners in Hong Kong are preparing (or being prepared by their parents) for one-on-one interviews to earn a seat in first grade at a good school, which reinforces the need to be responsible for their own academic performance early on. Kindergartners in the United States are typically shielded from such high-stakes academic challenges, given the culturally reinforced ideal to keep learning fun and enjoyable in order to nurture intrinsic motivation, self-esteem, and individual expression (Tobin et al., 2009).

Though an in-depth discussion falls beyond the scope of this article, it is crucial to note that each of the previously described factors do not operate as stand-alone predictors but must be considered within the configuration of factors that constitute the cultural system. For example, in a context in which academic achievement is seen as negotiable and effort seen as futile, a crowded classroom would not encourage competition and autonomy but result in unmotivated, disengaged students. Furthermore, the interpretation of any experimental data on children’s learning is only partial without a serious consideration of the learning-related meanings (What does it mean to learn?) and priorities (What are the most important lessons that children should learn?) as enacted in the classroom, noting that the answers to these questions can change with development and with the zeitgeist. In terms of the current results, however, learner autonomy is not only a set of regulatory skills such as inhibitory control but is also considered to be a construct—at the intersection of affect and cognition—that structures a person’s behavior and motivation when learning from others. Future research should explore the link between learner autonomy and the endorsement of conflicting testimony in children’s learning.

As multiple areas of research (conceptual development, executive function, social cognition, affect, and motivation) become increasingly integrated on an empirical level to yield a more holistic picture of how children learn about the world, our findings serve as a reminder that the picture will not be complete without considering the actual knowledge that children bring to the learning event, their socially shaped learning experiences, and their culturally shaped beliefs about what it means to be a learner.

References


Appendix

Items That Received Conflicting Labels (by Condition)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Button/Wheel</th>
<th>Tooth/Hairbrush</th>
<th>Socks/Mittens</th>
<th>Table/Chair</th>
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<td>Strong prior knowledge</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Weak prior knowledge</td>
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<td>![Image]</td>
<td>![Image]</td>
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