

The Role of Prior Belief in Children's Trust in Testimony:
A Social Ecological Approach

by

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“To wonder about how children learn is not new. The empirical study of children’s learning follows the rich tradition pioneered by Piaget. The consideration of sociocultural and ecological factors is rooted in the work of Vygotsky, Rogoff, and Bronfenbrenner. The examination of the links between parental and child behavior continues from social learning research. The systematic discussion on trust in testimony itself originated a few centuries ago in the voices of Hume and Reid. This investigation simply represents a young developmental psychologist’s effort to bring these rich theoretical traditions together to bear on one of the many age-old, yet perennially refreshing questions about how children learn.

I recall participating in the first year seminar for incoming graduate students, when so many discussions ended with the same desperate cry: Now that we acknowledge that all of these factors play a role and interact with one another, how do we ever begin to study everything? Indeed, even now this quest may feel a little daunting. Yet, standing on the shoulder of giants, not only are we enabled to look more closely at the complexities, we are empowered with the courage to do so.”

*To my dear family: Fafa, Mama, and Muimui, for being who you are,
for giving me unconditional support and the freedom to become who I am,
for giving me a heart to believe in the beauty and potential in every human being*

*To my Father in Heaven whose grace is always sufficient,
who held me in His hand even before I realized*

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Abstract

Throughout development, we accumulate knowledge about the world around us by reconciling novel information from external sources with our existing beliefs. However, little is known about how the reconciliation process develops, and how its development interacts with the environment. This dissertation explores the relationship between the strength of prior beliefs and children's trust in testimony, and examines how this relationship operates across different social contexts, developmental stages, and cultures. The cultural investigation, in particular, is organized in relation to the ways in which culturally-shaped beliefs and experiences combine to socialize independent vs. interdependent learners.

Across three studies ($N = 200$), preschoolers, kindergartners, and second-graders in the United States and in Hong Kong categorized objects in the presence of a confederate teacher, who sometimes provided labels that were in conflict with children's beliefs about the objects. The ambiguity of the objects receiving unexpected labels (ambiguous vs. non-ambiguous) and the social context (the teacher's presence vs. absence) were manipulated. Converging measures (endorsement of unexpected labels, spontaneous comments, and reaction times) were used to portray multiple aspects of children's trust behavior. Vignettes of hypothetical transgressions and questionnaire

items were further used to elicit trust-relevant perceptions from children and their caregivers.

Four key findings emerged from the investigation. First, the strength of prior beliefs influenced trust behavior across all social contexts, ages, and cultures examined. Second, the connection between endorsement and belief strength appeared more fine-tuned in older children. Third, and surprisingly, US kindergartners frequently endorsed unexpected testimony in all of their categorizations, whereas US and Chinese second-graders, *and* Chinese kindergartners were more selective, categorizing non-ambiguous objects based on their prior beliefs. Finally, the tendency for Chinese learners to be more prevention-focused and vigilant against error than US learners likely contributed to the cross-cultural patterns found in children's trust in testimony.

Chapter I

Introduction

Learning is a continual process of *reconciliation*. Young preschoolers may need to reconcile their older siblings' insistence that the earth is actually round with their own perception of the earth as flat. Adolescents may need to reconcile their experience with objects as solid and tangible with the concept that they are almost entirely empty space. College students may need to reconcile the assertions of foreign faiths and worldviews with the one which they have held dear since childhood. Throughout our lives, our understanding of the world around us continues to depend on the reconciliation of information from external sources with what we already believe. The focus of this dissertation is to begin to address how this type of reconciliation might take place across development — how do children respond to incoming information that appears in conflict with their prior beliefs? Specifically, at what age do children become sensitive to the strength of their own beliefs, and use this to guide their endorsement or rejection of what other people say? Furthermore, how do people's attitudes about learning, as shaped by communities and cultures, affect the way they learn from others?

These questions were investigated across three studies. Study 1 examined the role of prior beliefs on preschoolers' endorsement of a teacher's unexpected labels for

ambiguous and non-ambiguous objects. Study 2 extended the investigation across development and cultures by examining the phenomenon in kindergartners and second graders growing up in Michigan, US and in Hong Kong, China. Study 3 explored the social ecological contexts of children's trust in testimony, by looking into trust-relevant perceptions and attitudes held by US and Hong Kong children and their parents. Several bodies of work are central to a discussion of these questions. First, burgeoning research on children's trust in other people's testimony offers a rich empirical landscape to position the present investigation. Second, the social ecological model of human development offers an important framework to think about and address the multiple contexts in which a learning child is situated (Bronfenbrenner, 1979). The current chapter reviews these bodies of work in relation to the empirical questions at hand.

Trust in Testimony: An Empirical Landscape

As sentient communicators in a social world, we give and receive "testimony" on a daily basis. Testimony can be given about all kinds of conceptual domains, from the shape of the earth to your date of birth to what you had for breakfast. Testimony can occur in many communicative settings and include verbal and written assertions, ranging from BBC news broadcasts to historical facts presented in textbooks to a pedestrian providing directions to a lost tourist. Clearly, much of what we believe about ourselves and about the world is based on testimony.

Perhaps the most striking evidence of the impact of testimony comes from children's developing concepts of what they cannot observe firsthand, such as the shape

of the earth, how the brain works, and God (see Harris & Koenig, 2006). For example, research on mental models has suggested that even though children's firsthand experiences would suggest that the earth is a flat, extended, and supportive surface, they begin to integrate the testimony received from others with their own experiences (leading to intermediate mental models such as flattened spheres), and eventually develop a mental model consistent with the spherical version endorsed in the culture (Vosniadou & Brewer, 1992). Thus, for what we cannot observe or discover firsthand, we tend to rely on knowledge passed on to us by other people. This dependence on others for knowledge is demonstrated most clearly by children for whom learning from testimony is a well-practiced proximal process in formal schooling (Bronfenbrenner & Morris, 1998). Even outside of formal schooling, children frequently encounter and seek the testimony of the more experienced members of the community, such as their parents in everyday conversations (Chouinard, 2007; Frazier, Gelman, & Wellman, 2009, Study 1), or their elders in apprenticeship contexts (Childs & Greenfield 1980; Maynard, 2002). Therefore, the need to trust in testimony goes beyond the boundaries of cultures and of contemporary schooling.

Perspectives in Philosophy

Indeed, for a number of centuries, questions about the basic mechanisms of trust in testimony have captured philosophers' imagination. According to Reid (1764), we trust in testimony *by default*, the same way we treat information entering through our senses. In other words, assertions of other people are taken to be true, just as we

typically believe the things we see with our eyes, feel with our fingertips, or recall in our memories. At the same time, philosophers stress that a default trust in testimony is by no means “blind”. The essential claim is that as long as there is no available evidence (such as doubt, or conflicting experiences) against accepting a speaker’s assertions, it is unnecessary to do additional epistemic work to justify belief based on the speaker’s testimony. By this account, one needs to accumulate experience in order to realize that testimony does not always conform to reality. Continuing this line of reasoning, it follows that the earlier in development, the more robust the trust response.

In contrast, according to Hume (1748), we *learn* to trust in testimony. Instead of being a default response, a person’s trust is built on repeated experiences of reliable testimony. These experiences can be gained through the encounters of oneself or of other people. Testimony itself has to be *first* evaluated on its reliability as a source of true knowledge. To justify belief in testimony— both globally as a source of knowledge and locally as a specific assertion, additional epistemic work is required by way of our perception, and our inductive and reasoning capacities. By this account, the tendency for a person to trust in testimony is a function of the quality of one’s epistemic environment. A child growing up in an environment in which an overriding proportion of testimony proves reliable is likely to respond to future testimony with faith. A child growing up in an environment in which testimony rarely proves reliable is likely to respond to future testimony with doubt. In other words, the development of a trust response is not guaranteed, but depends on the goodness-of-fit between the testimony that one encounters and the reality that one perceives.

Whether we trust in testimony by the givens of nature or by the prompting of nurture continues to engage contemporary philosophers. However, several critics lament that debate about this dichotomy has led many philosophers to focus on just the learner or just the informant but not both (Lackey, 2006), signaling a move toward an interactionist approach in the philosophical discourse on testimony.

Perspectives in Developmental Psychology

A similar pendulum swinging between a focus on the learner and a focus on the informant has also been active in the area of cognitive development. A rich history of studies on conceptual development has often focused on mapping out children's beliefs about a wide range of domains at different ages, yet without equal attention to the role of input (see Gelman, 2009 for a discussion of this paucity and the possibilities for research). As a result, although we are increasingly equipped to describe what children at different ages know about the shape of the earth (Vosniadou & Brewer, 1992), germs (e.g., Kalish, 1999), the spiritual world (e.g., Giménez-Dasí, Guerrero, & Harris, 2005), and other domains, there is still more to be discovered as to how children acquire this knowledge from external sources.

Focusing on the Relative Reliability of Informants

One way to address this gap is to study how children learn from other people. In recent years, an increasing number of studies have identified factors that permit and preclude young children's trust in other people's testimony. Some factors have to do with the *identity of the informant*. Specifically, preschoolers seem more prone to trust in

the testimony from a person whose identity signals the possession of special knowledge about the subject matter. For example, three- and four-year-olds were more likely to accept an unexpected label for an object if the label was given by a person who created the object than if the label was given by a person who merely found the object (Jaswal, 2006). In another study, preschoolers were more likely to direct questions about the nutritional value of food to an adult, but to direct questions about toys to a child (VanderBorghet & Jaswal, 2009). Other factors have to do with the *verbal and pragmatic cues* from the informant. Preschoolers hearing a cat-like animal being labeled as a *dog* were more likely to trust in labels that were prefaced by phrases such as “you’re not going to believe this, but this is actually an dog” or “look at this Berkshire dog” than labels that were presented in isolation (Jaswal, 2004, Studies 2 and 3). Furthermore, children as young as two preferred to learn about a novel object from someone who appeared confident than from someone who appeared uncertain (Birch, Akmal, & Frampton, 2010; Jaswal & Malone, 2007). Other factors have to do with *other people’s approval* of the informant’s testimony. Recent studies have found that preschoolers preferred to seek and endorse labels for novel objects from people whose prior claims were shared by others present (Corriveau, Fusaro, & Harris, 2009) or received cues of approval from bystanders (Fusaro & Harris, 2008).

However, the factor receiving the most attention by far has been the relative *accuracy or reliability* of an informant. After all, every instance of testimony can be assessed on its accuracy, whereas the factors reviewed above accompany only some instances of testimony, and are themselves cues to an informant’s reliability. A

paradigm frequently used to study children's attention to informant reliability was developed by Harris, Koenig, and their colleague, and modified across a range of investigations (Koenig, Clement, & Harris, 2004; Koenig & Harris, 2005a; Koenig & Harris, 2005b; Pasquini, Corriveau, Koenig, & Harris, 2007). In this paradigm, children watch as two informants (typically shown in a video) label known objects, one of them correctly and the other incorrectly, over a number of trials. At test, a novel object is introduced and receives contrasting labels from the same two informants. Children are asked a series of questions to probe their preferred informant as well as their evaluations of both.

Results show that by the age of four, children trust in a previously accurate speaker over a previously inaccurate one, and are attuned to finer gradations in accuracy, for example, in judging a person who was accurate 75% of the time to be more trustworthy than a person who was accurate 25% of the time (Pasquini et al., 2007). When information processing demands were reduced or when the inaccurate informant was presented explicitly as ignorant (e.g., *"I don't know what this is"*), even 3-year-olds showed differential trust in the accurate informant. Another version of this paradigm found that preschoolers preferred to trust a previously accurate informant over a neutral one (who was present but did not give testimony in earlier trials), and to trust a neutral informant over a previously inaccurate informant (Corriveau, Meints, & Harris, 2009). Similar work conducted by other researchers corroborated with the finding that children at around age three begin showing sophistication in their attunement to an informant's relative accuracy, and in their trust in testimony about

object labels as well as functions (Birch, Vauthier, & Bloom, 2008; Diesendruck, Carmel, & Markson, 2010; Jaswal, McKercher, & VanderBorgh, 2008 Study 1; Scofield & Behrend, 2008).

In addition, some research has sought to *clarify the boundaries* of young children's ability to appropriately trust in other people's testimony. For example, work in this area has extended the developmental trajectory to earlier ages, showing that 14-month-old infants preferred to follow the gaze of a person who looked into containers that had toys in them over a person who looked into containers that were empty (Chow, Poulin-Dubois, & Lewis, 2008), and that 12-month-olds were more likely to help a person search for an item by pointing to the correct location when the person was ignorant about where the item fell than when the person was knowledgeable (Liszkowski, Carpenter, & Tomasello, 2006). Other studies have looked at the *pervasiveness* of children's trust based on past accuracy. On the one hand, the phenomenon was pervasive over time such that preschoolers were able to retain a correct preference for an accurate informant even after a week's delay (Corriveau & Harris, 2009). On the other hand, preschoolers' trust in the more accurate informant did not pervade across all domains. In the domain of language, 3- to 5-year-olds preferred to adopt regular verb inflections (e.g., *bepped* as the past tense form for *bep*) from a previously *inaccurate* informant over adopting irregular inflections (e.g., *bup*) from a previously *accurate* informant (Jaswal et al., 2008). These findings suggest that children do not simply encode the trustworthiness of a speaker as an overriding characteristic, but to an extent, consider each instance of testimony on a case-by-case basis. In this

case, children, who were more familiar with regular inflections, found it hard to reconcile this anomalous type of inflection with their expectations, and subsequently suspended their tendency to trust in a previously more accurate speaker.

Finally, an emerging direction of work asks whether children understand the factors enabling or constraining—or the *underlying reasons* for—the reliability of an informant. These factors may be *situational*, such as the perceptual access of a person to the information in question (Bhandari & Barth, 2010; Kushnir, Gelman, & Wellman, 2008; Nurmsoo & Robinson, 2009; Robinson & Nurmsoo, 2009) or they may involve *personal traits*, such as the reputed malevolence of an informant (Mascaro & Sperber, 2009; Vanderbilt, Liu, & Heyman, in press). Emerging data seem to suggest that children are quite sophisticated in reasoning about whether an informant is *able or unable* to provide reliable testimony, but are less sophisticated in deciding whether or not to trust someone who might *intend* to provide unreliable testimony (i.e., to lie or to trick others).

However, as investigations into the nuances of children's trust in testimony become more complex, the research pendulum seems to have swung closer to the informant but further away from the learner. Whereas intense attention is being devoted to how children evaluate other people as knowers, relatively little attention has been given to trust as a process of cognitive reconciliation. Though children necessarily bring their expectations and prior beliefs to each trust-in-testimony task, few studies have directly addressed whether and how these prior beliefs might play a role in

children's trust behavior. Thus, the focal question posed in this dissertation is: *Do children endorse another person's testimony when it runs counter to their own prior beliefs? Does the nature of children's prior beliefs influence their decision to endorse or reject the testimony?*

Focusing on Self vs. Others

Situation-Specific Facts. To begin this inquiry, I review experimental designs that have children receive testimony from a single informant instead of two. In the single informant situation, the fundamental challenge shifts from comparing one informant against another for *relative* trustworthiness to comparing the knowledge presented by another person and the knowledge possessed by the *self*. For example, in studies examining children's trust in others for the location or identity of hidden objects (Clement, Koenig, & Harris, 2004; Ganea & Harris, 2010; Ma & Ganea, 2007; Robinson, Haigh, & Nurmsoo, 2008), an informant's testimony is frequently pitted against access to the information by the self. In one such study (Ma & Ganea, 2007), preschoolers were told that a prize was hidden in one location after they had seen the prize hidden in a different location. Whereas the 4- and 5-year-olds were able to override the testimony with what they perceived with their own eyes, 3-year-olds tended to be misled by the testimony and to search in the wrong location. Not until they were given further experience with the misleading informant or positive experience of searching on their own did 3-year-olds begin to disregard false testimony. Findings suggest that older preschoolers were able to take into account the fact that they did possess relevant prior

beliefs to inform their decision to reject misleading testimony, whereas younger preschoolers needed additional experiences to make the relevance of their prior beliefs explicit. Therefore, this work offers an important look into how children differentially weigh their own vs. other people's beliefs. However, one limitation of this body of work is that it typically involves testimony about facts that are more arbitrary and specific to the moment of the experiment (e.g., the location of a prize, the color or texture of a hidden object) as opposed to those that relate to the existing beliefs, theories, and biases which children bring to the task. Thus, it is not clear how far these findings could be extrapolated to naturalistic and everyday learning in which children reconcile something new with something they already know.

Physical Laws. Recent work done by Jaswal (2010, Study 1) takes an important step in this direction, by taking advantage of a robust bias that toddlers are known to demonstrate: gravity bias, or the expectation that objects fall *straight* down when unsupported. This research used an apparatus previously developed by Hood (1995)— a construction of three chimneys above three cups, with a set of opaque connecting tubes in between. The tubes are configured in such a way that objects dropped through a chimney always lands in a cup other than the one directly below. Because the tube trajectories are visible, adults and older children have no trouble matching the cups to the chimneys. Using this apparatus, what Hood (1995) showed was that children up to 3 years of age were biased to search in the cup directly below a chimney, and that this bias was robust even after witnessing the object fall through the tube and land in a different cup. In Jaswal (2010)'s study, children's "gravity bias" was pitted against

testimony. In each trial, 30-month-olds (an age at which gravity bias was observed) watched an object drop into one of the chimneys, and were asked to point to the cup that contained the object. Then, an experimenter told children where the object had actually landed. After the testimony was given, children were asked to search for the object. Interestingly, toddlers consistently showed a gravity bias in their pre-testimony responses, but once testimony was given, they overwhelmingly went against their bias and trusted in the testimony. However, on successive trials, they would revert back to their gravity bias in their pre-testimony response. This pattern persisted at similar levels across a total of six trials. It was intriguing to witness, on the one hand, the robustness of the gravity bias, such that children kept reverting to it even on later trials and with no observable signs of uncertainty (Jaswal, personal communication), and, on the other hand, the power of testimony, such that 30-month-olds abandoned their self-generated bias to follow the testimony whenever it was available. In other words, young children showed a bias to trusting in testimony that allowed them to overcome a strong prior belief, but at this age, testimony alone was not enough to trigger observable cognitive conflict or to enable learning.

Categorical Labels: The Present Investigation. The research thus far suggests that children up to age 3 have a strong and specific bias to trust another person's testimony; they persisted in trusting the claims of a person whose testimony either ran counter to their preexisting biases about physical laws or was misleading on preceding trials (Jaswal, Croft, Setia, & Cole, 2010). At the same time, not as much work has looked at whether *older* preschoolers might trust in a single informant whose testimony runs

counter to their prior beliefs. Studies that presented a malevolent informant who clearly intended to trick the child (Mascaro & Sperber, 2009; Vanderbilt, Liu, & Heyman, in press) found that 4-year-olds, but not 3-year-olds, were able to appropriately abandon their trust in a malevolent informant. This is an important finding that shows children's emerging competence to overcome their bias to trust in other people's testimony. Yet, in real life contexts, it is more likely for children to encounter testimony from apparently well-intentioned informants (e.g., parents, teachers, peers) than from someone with explicitly ill intentions. Thus, it is important to take a closer examination of how children respond when encountering testimony from such well-intentioned informants.

The present investigation asks whether children were able to adapt their level of trust in unexpected testimony in relation to the strength of their prior beliefs. To examine this relationship, a task domain was chosen based on two criteria. The first criterion was that the domain should contain enough internal variability to induce different levels of certainty in older preschoolers. In other words, children should be more certain about some aspects of the domain but less certain about other aspects. For example, given this criterion, the chimney game used with toddlers by Jaswal (2010) was ruled out as a possible candidate, because older children, who no longer exhibit gravity bias, would be able to reason with equal certainty about any variation of the apparatus. The second criterion was for the task domain to have some connection to the existing beliefs, theories, or assumptions that children had prior to the research session. Given this criterion, situation-specific facts including the location of a prize or

property of a block were also ruled out as possible candidates, because children's beliefs about these facts would be necessarily limited to the context of the research session.

Based on these considerations, the final design presented a series of everyday artifacts for children to sort into specific categories, with testimony provided in the form of category labels for those objects. Using everyday artifacts fulfills the first criterion because objects differ on their typicality, and therefore, can induce varying degrees of certainty about their category membership (Mervis & Rosch, 1981). Using everyday artifacts also fulfills the second criterion, considering the power of category labels to invoke existing inferences that children have about a category, inferences that may be used to form hypotheses about novel exemplars (Gelman, 2003). Because such inferences are rooted in preexisting beliefs that children bring to the task, we can then explore how they might integrate testimony that runs counter to these beliefs.

In the present design, children played a computer game in which they matched everyday artifacts to one of two categories. For a set of target items, testimony was given in the form of category labels that were incoherent with children's prior beliefs about the items. Trust in testimony was operationalized as children's frequency of endorsing the unexpected labels in their category judgments. The strength of prior beliefs was manipulated by presenting objects that were ambiguous or non-ambiguous (determined based on pilot testing) to the children. Children's endorsement of unexpected labels for ambiguous vs. non-ambiguous items thus served as the core contrast for the present set of studies.

A number of past studies have also used ambiguous and non-ambiguous objects as part of their design. For example, in studies looking at informant reliability (e.g., Koenig, Clement, & Harris, 2004), children saw videos in which two informants labeled non-ambiguous objects (e.g., a typical shoe) either correctly (e.g., "It's a shoe!") or incorrectly (e.g., "It's a bottle!"). Afterwards, children were asked to choose one of those two informants to learn labels for novel objects. The fact that 4-year-olds were likely to choose the more reliable informant for learning about novel objects indicates that they had no difficulty, when presented with correct labels juxtaposed with incorrect ones, to recognize the more appropriate labels for non-ambiguous objects. However, it is unclear as to how children might respond if incorrect labels were provided by a *single* informant with clear communicative intentions (but see Koenig & Woodward, 2010 for suggestive data in 24-month-olds). For example, a child might be *certain* that the animal in her picture book was a duck (with its characteristic webbed feet and bill) until her babysitter called it a platypus. With no other informant for comparison, she would have to resort to her own prior beliefs to reconcile the apparently conflicting label. In the current investigation, this situation (in which testimony conflicted with strong prior beliefs) was addressed in terms of children's endorsement of an adult's unexpected labels for *non*-ambiguous items.

Another relevant line of work (Jaswal, 2004) presented hybrid animals or artifacts that combined the features of two items, for instance, both a cup and a hat, but looked more like a cup than a hat. On their own, 4-year-olds categorized hybrid items based on their perceptions (e.g., as a cup) almost all of the time, but after hearing

an experimenter label it the other way (e.g., as a hat), they switched to categorize according to the unexpected label at above chance levels! Thus, the 4-year-olds sometimes trusted in unexpected testimony about things for which they had prior beliefs but were not entirely certain. For example, another child might see the platypus and believe it to be a duck, but also notice that, apart from the webbed feet and the bill, it really looked nothing like the other ducks he had seen. In the midst of her uncertainty, the label of platypus might be more readily endorsed. In the current investigation, this situation (in which testimony conflicted with weak prior beliefs) was addressed in terms of children's endorsement of an adult's unexpected labels for *ambiguous* objects.

Together, these features allow us to examine children's levels of trust in a single informant's unexpected testimony across situations for which their prior beliefs are relatively strong and situations for which their prior beliefs are relatively weak.

Trust in Testimony from a Social Ecological Perspective

Although it is possible, and even helpful, to study and talk about children's trust in testimony in terms of measurable constructs, human learning is also a social process. Children's trust in other people's testimony is, in essence, a transaction that happens not in a vacuum, but in a social and cultural context imbued with meanings, expectations, and priorities. Indeed, past work has acknowledged this in many ways, examining children's consideration of social cues such as the confidence of an informant (Birch, Akmal, & Frampton, 2010; Jaswal & Malone, 2007), the approval of bystanders (Fusaro et al., 2009), and by positioning itself as a research area in the broader field of

social cognition. At the same time, much of the existing research has been conducted in laboratory contexts, and for a phenomenon as socially embedded as trust in testimony, it may be worth clarifying how children's trust in others for information might be influenced by various aspects of the *context* in which the testimony is given.

One line of work by Corriveau and colleagues (2009) placed children's epistemic trust in the context of their attachment relationships with their mothers. Each child viewed pictures of novel or hybrid items, and heard his or her mother and a stranger name each item in contrasting ways. In some trials, the stranger used labels that matched the items better than the labels from the mother. In some trials, the two labels matched the items equally. The key finding was that children's tendency to endorse labels from the mother vs. the stranger differed by their attachment status based on an assessment at 15 months of age. Securely attached children were appropriately flexible in endorsing (or rejecting) their mothers' labels. Insecure avoidant children showed less reliance on their mothers' claims (even when the claims were trustworthy), whereas insecure resistant children showed greater reliance on their mothers' claims (even when the claims were untrustworthy). Thus, the social relationship between mother and child was predictive of a child's cognitive reliance on the mother for knowledge.

Children have also been reported to bring the routines and assumptions salient in their cultural communities to a trust scenario. Three- and 4-year-olds' conformity to inaccurate consensus was explored in a simplified version of the classic Asch conformity paradigm (Corriveau et al., 2009). In this task, children were asked to pick the longest

line out of three after viewing a video that showed a group of adults simultaneously and unanimously choose the wrong line. In addition to observing evidence of occasional conformity in these children, researchers discovered that Asian American children were more likely to conform to the inaccurate consensus than their Caucasian American peers who attended the same preschools. However, when asked to pick the longest strip to build an adequate bridge, all of the children were able to pick out the longest line. Thus, the results showed that children sometimes withheld their own perceptually based judgments in apparent “respectful deference” of the majority view, and that children’s ethnic or cultural backgrounds appeared to play a role in shaping this behavior.

These examples demonstrate the value of studying children’s trust in testimony with greater consideration given to contextual factors. In the current investigation, children’s trust in unexpected testimony was examined in two social contexts (in the presence vs. absence of the informant) and two cultural contexts (US and Hong Kong).

The examination of social context was motivated by the goal of capturing more completely the extent of children’s trust in this paradigm. What does it mean when a child endorses an unexpected label in this task? More specifically, does endorsement reflect a willingness to consider the label as potentially true, or is it simply a response to the social demands of a physically present informant? One way to test these possibilities was to see whether children, when removed from the social demands of the informant, were still willing to pass on the unexpected label to another learner. This was achieved in the present design by having children categorize target items, first in the presence of

the informant, and a second time in her absence, when the children assumed the role of informants themselves in a demonstration for younger learners.

The examination of cultural context was motivated by the goal of addressing the question of whether children's development of trust in other people for knowledge followed universal trajectories. Because the majority of the research in this field were conducted with English-speaking learners socialized in either North America and Britain (but see Mascaro & Sperber, 2009, who tested children in France), there is reason to explore how children socialized in other cultural contexts might be similar or different in their development of epistemic trust. The present investigation compared across young learners socialized in the US and their peers socialized in Hong Kong to begin exploring the role of the cultural context in the children's trust in testimony.

The call for more attention to context is not new in developmental science. Over several decades, multiple proposals of general theoretical approaches have "arose in reaction toward decontextualized, reductionist laboratory studies of children that dominated the 1960s and 1970s" (Miller, 2002). These approaches share in the goal of characterizing the developing person as *situated* in a complex environment (e.g., Elder, 1998; Magnussen, 2000; Magnussen & Statin, 1998; Rogoff, 1993; Sameroff & MacKenzie, 2003; Vygotsky, 1978). In particular, concepts from the social ecological model (Bronfenbrenner, 1979; 1993; Bronfenbrenner & Morris, 1998) provides an effective structure for conceptualizing the multiple components in the present inquiry.

The ecological model (Bronfenbrenner & Morris, 1998) organizes the way in which we conceptualize human development in terms of four components: *process*, *person*, *context*, and *time (PPCT)*. More crucially, it organizes the way in which we can think about the multiple goals of this dissertation. First, the idea of “proximal processes” is a key construct referring to the *regular* forms of interaction between a person and the environment. Posited as the primary engines of development, proximal processes are bi-directional, extended in time, and progressively complex. Children’s reconciliation of other people’s testimony and their own beliefs, as a core aspect of knowledge acquisition, is the proximal process central to the present inquiry.

Second, the ecological model renewed an emphasis on the *person*, which includes “the individual dispositions, resources, and demand characteristics brought to the proximal process”. In the present inquiry, the *person* component relates to the way in which children bring their prior beliefs of varying strengths to the proximal process of reconciliation (Studies 1 and 2).

The third component, *context*, likely the most cited component in the original version of the ecological model (Bronfenbrenner, 1979), distinguishes between multiple levels of contexts including *micro-*, *meso-*, *exo-*, and *macro-*systems. The contexts that interact most directly and proximally with the developing person are the *microsystems*, such as the family, the school, and the neighborhood. In the present inquiry, testimony was presented in a format that was entrenched in the microsystem of children’s own schools, and the social identity of the informant was explicitly marked as part of this

microsystem (a teacher helping at the school). Furthermore, social context was manipulated at the microsystem level to examine whether the physical presence vs. absence of the teacher influenced children's endorsement of unexpected testimony (Chapters 2 and 3). The *mesosystem* and *exosystem* are defined as the set of "linkages and processes taking place between different contexts relevant to the developing person." In other words, they refer to the ways in which processes in one developmental context might relate to processes in another. For example, different socialization practices in the family may influence popularity in the peer group. In the present inquiry, parents' perceptions and attitudes about teaching and learning were examined in relation to children's trust in a teacher's unexpected testimony (Chapter 4).

Finally, the *macrosystem* is the cultural component that confers structure and meaning to the micro-, meso-, and exosystems. It includes the "belief systems, resources, hazards, life styles, opportunity structures, life course options, and patterns of social exchange" embedded in each layer of developmental context (Bronfenbrenner, 1993). In the present inquiry, aspects of the macrosystem were examined by comparing American and Chinese children's trust in testimony. The two cultural contexts have been shown to contrast on multiple dimensions regarding how learners are socialized to acquire knowledge. As will be discussed in Chapter 3, two dimensions appear of particular relevance to trust in testimony: the styles in which learners conduct and present themselves (stemming from Socratic vs. Confucian traditions) (e.g., Tweed & Lehman, 2002; Li & Fischer, 2004) and the importance of academic achievement (related to the perceived importance of school performance and its consequences) (e.g.,

Stevenson & Lee, 1990; Ng, Pomerantz, & Lam, 2007). On the one hand, the two dimensions may be seen as a manifestation of the independent versus interdependent self. On the other hand, each dimension is unique in its predictions about US and Chinese learners' trust in testimony. In the present investigation, trust-relevant perceptions and attitudes held by children and their parents in the United States and Hong Kong were elicited. These perceptions and attitudes were then examined in relation to how US and Hong Kong children responded to unexpected testimony (Chapters 3 and 4).

The final component of *PPCT* is *time* (Bronfenbrenner & Morris, 1998). Time can be understood at either the developmental level or the historical level. Indeed, both interpretations of time turned out to be important in this dissertation. At the developmental level, Studies 1 and 2 sampled children's trust behavior at several time points (preschool, kindergarten, and second grade) of being socialized as learners in their respective cultural contexts. At the historical level, an appreciation of culture as dynamic rather than static, of the concerns and emphases in a cultural context as not fixed but malleable, and of the fact that even empirical observations are tied to the circumstances and *zeitgeist* of a point in history, have led to a deeper analysis of the processes shaping children's trust in testimony.

Bringing the above questions together, this dissertation explored, first and foremost, the role of prior beliefs in children's trust in testimony by looking at how the strength of children's prior beliefs related to their endorsement of a teacher's

unexpected labels for ambiguous and non-ambiguous items. The role of social context in trust was examined by comparing children's endorsement of unexpected labels in the teacher's presence vs. in her absence. Study 1 established the methodology and examined the phenomenon in US preschoolers. Study 2 extended the investigation to kindergartners and second-graders in the US and in Hong Kong. Study 3 enabled further insight into the socialization experience of Study 2 participants, using survey methods and vignettes of hypothetical transgressions to elicit trust-relevant perceptions and attitudes held by US and Hong Kong children and their caregivers.

Chapter II

Study 1: The Role of Prior Belief in Trust in Testimony

The primary goal of Study One was to investigate the relationship between the strength of prior belief and trust in a teacher's testimony in preschool-aged children.

By age four, children are shown to be sophisticated at comparing informants on their trustworthiness, by being able to pick the better informant out of two based on various cues, such as the informants' relative histories of accuracy (Corriveau et al., 2009; Koenig et al., 2004; Koenig & Harris, 2005a; Koenig & Harris, 2005b; Pasquini et al., 2007), pragmatic cues such as bystander approval (Birch et al., 2010; Fusaro & Harris, 2008; Jaswal & Malone, 2007), and the magnitude of informants' past errors (Einav & Robinson, 2010). Children's ability to determine the better informant for cognitive purposes even trumps social affinity, as shown by their overall preference for a consistently accurate stranger over their own caregivers including their teachers (Corriveau & Harris, 2009) and even their mothers (Corriveau et al., 2009,) when their caregivers had been inaccurate on previous trials in the experiment.

Although the existing literature points to 4-year-olds' impressive ability to choose the better informant out of two, less is known about how children respond to

testimony presented by a single informant. When only a single informant is available, the learner's tasks fundamentally changes from being a comparison across informants to identify the *relatively* trustworthy source, to being a comparison across knowledge presented by the other and knowledge possessed by the *self*. This situation has high ecological validity, considering that in everyday contexts, a learner does not always have the luxury of comparing across neatly juxtaposed sources of information. More often, and especially for young children in their school contexts, testimony is presented by a single individual, such as the teacher. Occasionally, this testimony may run counter to the prior beliefs of the learner. What do children do when faced with a single informant presenting unexpected testimony?

As reviewed in the preceding chapter, children up to the age of three appear to be powerfully and specifically biased toward trusting in verbal testimony. The bias is *powerful* because testimony has been found to override one's naïve biases about physical laws (Jaswal, 2010, Study 1), to override one's inferences about the location of an object (Jaswal, 2010, Study 2; Ma & Ganea, 2007), and to override the reported or observed trickiness of an informant (Jaswal et al., 2010; Mascaro & Sperber, 2009; Vanderbilt et al., in press). This bias is *specific* because it manifests, in particular, in response to verbal testimony (as opposed to a non-verbal signal) provided by a visible (as opposed to invisible but audible) informant (Jaswal et al., 2010). In comparison, by age four, children were more likely to demonstrate skepticism toward testimony when their own perceptions suggested otherwise, or when the intentions of an informant were in doubt.

However, less is known about whether and in what ways 4-year-olds reconcile their prior beliefs with questionable testimony. Specifically, are children, by age four, able to adapt their level of trust in such testimony by taking into account the strength of their own prior beliefs? Or, are children at this age biased to privilege their own beliefs over another person's questionable testimony all of the time? Important insight comes from work that presented hybrid animals and artifacts to children, whose task was to make categorical inferences about them (Jaswal, 2004). Each hybrid combined the features of two similarly-shaped entities of different categories (e.g., a dog and a cat), and always resembled one category (e.g., a cat) more than the other. In the absence of testimony, children made inferences about the hybrid items based on what they looked like (e.g., pairing the cat-like hybrid to a bowl of milk and not to a piece of bone). However, after hearing an experimenter label the hybrid items in a way that ran counter to what they looked like (e.g., calling the cat-like hybrid a *dog*), children were more likely to make inferences about the hybrid items based on the unexpected label. These findings suggest that children may be sensitive to the uncertainty of their own perceptually based intuitions about the hybrids, and their increased need for an alternate source of information. Another explanation may be that children were simply biased to trust in the experimenter's testimony when it was made available.

Two reasons favor the former, "metacognitive", account. First, children did not always endorse the experimenter's testimony over their own perception, with 3-year-olds going with unexpected labels 67% of the time and 4-year-olds doing so only 41% of the time. Second, children occasionally made spontaneous comments that show their

surprise or doubt of the labels (e.g., “That doesn’t look like a dog”), revealing some awareness of their cognitive conflict. Thus, children’s increased reliance on testimony seemed not to be due to a simple bias to trusting others for knowledge, but due to a greater sense of their own uncertainty and need of further information. The present study begins to examine these possibilities, by manipulating the strength of children’s prior beliefs.

Specifically, the present study compared 4-year-olds’ endorsement of unexpected labels for ambiguous items with that for non-ambiguous items. All items were chosen based on preliminary work confirming that children’s prior beliefs were weaker for the ambiguous items and stronger for the non-ambiguous items. If the strength of prior beliefs is not related to children’s trust in testimony, then children should endorse the unexpected labels to similar extents across ambiguous and non-ambiguous items. However, if the strength of prior beliefs plays a role in children’s trust in testimony, then children should endorse the unexpected labels to different extents. Specifically, they should endorse unexpected labels for ambiguous items more frequently than for non-ambiguous items. Given existing accounts in the literature, and 4-year-olds’ remarkable sensitivity to the relative accuracy of others, I predict that preschool-aged children will be able to adapt their level of trust in a single informant’s unexpected testimony in relation to the strength of their prior beliefs.

Finally, because most previous studies were conducted in a laboratory based experimental context, this investigation presented a testimony scenario that was

entrenched in the ecology of participants' own school to look at whether children's epistemic trust manifested itself differently across social contexts. As will be described in greater detail, children, although aware of their participation in a research activity, were told that their role was to help the experimenter make a video for teaching younger children how to play an object categorization game. Before making each video, children practiced one round while the experimenter left the room to get a new recorder. A teacher working nearby, asked to accompany the child during practice, provided unexpected labels for target items in the game. Thus, the situation was designed such that the teacher's labels did not come across as an overt, pre-planned part of the research activity. When the experimenter returned, the teacher left the room to do some other work. The child proceeded to play the game again, this time being recorded to help teach younger learners about the different objects.

Children's endorsement of unexpected labels in the informant's presence during practice was compared to their endorsement in the informant's absence during the pedagogical demonstration. Doing so revealed the degree to which children's overt endorsement of unexpected labels could be explained by mere compliance with social demands (i.e., the presence of the informant), and the degree to which it reflected true endorsement, that is, an effort to remember the unexpected labels and a readiness to consider the unexpected label as worthy of transmitting to other learners.

Method

Participants

Forty 4-year-olds ($M = 4$ years, 8 months; 20 boys and 20 girls) took part in the current study. Children were recruited from three preschools in southeast Michigan. All participants had written consent from their parents, and were tested individually in a quiet room at their schools.

Design

Children were first asked to identify a series of ambiguous objects in a picture book (Appendix A). They were randomly assigned to one of three conditions, in which they played a categorization game on a touch screen computer twice (Appendix B). The first time was in the presence of a teacher who provided category labels for the items in the game. For designated “target” items, the category labels aligned or did not align with children’s prior beliefs. The second time was in the teacher’s absence and in front of a video camera as a pedagogical demonstration for younger children. Independent measures included 1) the alignment of testimony with children’s prior beliefs about target items, 2) the ambiguous vs. non-ambiguous identity of the target items, and 3) the presence vs. absence of the teacher. The key dependent measure was children’s frequency of endorsing testimony about the target items. Additional dependent measures included spontaneous comments made in response to the testimony, as well as the time taken to make a categorization decision.

Materials

An interactive picture matching game was created using the software E-Prime 2.0 on an IBM notebook computer installed with a KeyTec add-on touch screen. The keyboard was hidden using a custom piece of cardboard, so that touching the screen was the only apparent mode of response. All pictures shown in the computer game were digital photographs of everyday artifacts, resized to 158 pixels by 158 pixels using an image editing software (see Appendix A). During the game, a picture prompt (e.g., of a button) appeared centered in the top half of the screen. In the bottom half of the screen, two pictures (e.g., of a jacket and of a car) appeared on the left and right sides. Based on the picture prompt, children had to select and touch the appropriate match on the bottom (see Appendix B for a visual example).

Four category pairs were presented: buttons vs. wheels (to be matched with a jacket vs. a car), hairbrushes vs. toothbrushes (to be matched with hair vs. teeth), socks vs. mittens (to be matched with feet vs. hands), and tables vs. chairs (to be matched with dishes vs. a sitting man). These four category pairs corresponded to four “rounds” in the game, with each round structured identically as follows.

First, a start screen appeared to introduce the category pair and their respective matches (Appendix B). In a research session, each start screen was accompanied by verbal instruction (e.g., “In this round, you need to match the buttons with the jacket, and the wheels with the car.”) Then, three items were presented consecutively. The first two were standard items, one of each category (e.g., a standard button, and a standard

wheel). The third was always a target item. Children were allowed as much as time as they needed to categorize each item. After the third item was categorized, a new start screen appeared to introduce the next category pair and their matches. At the end of all four rounds, images of fireworks appeared on the screen to indicate the completion of the game. All of the items used in the computer game, including both standard and target items, are shown in Appendix A. Because there were four rounds each containing one target item, a total of four target items were presented in a single research session. Half of the children saw target items that were non-ambiguous (Non-ambiguous condition), and half of the children saw target items that were ambiguous (Ambiguous condition). Target items were determined as “ambiguous” vs. “non-ambiguous” based on a series of pilot work, with the details described as follows.

Target items were drawn from a larger pool of potential items based on pilot data collected via internet surveys with adults ($n = 72$) as well as interviews with 4- and 5-year-olds ($n = 42$) residing in the US and in Hong Kong. Participants viewed and answered questions about these potential items. Via an internet survey, adults were asked to identify each item (e.g., "What do you think this is? A button or a wheel?"), and to rate how easy or difficult it was to make the decision. A 6-point scale ranging from effortless to impossible was used for rating the items.. In a picture book activity, preschoolers were asked to identify each item (e.g., "What is this?"), and to pair it to one of two picture matches (e.g., "What is it a part of? The jacket or the car?")

Based on the combined data from adult and child respondents, a final set of eight target items—four non-ambiguous items and four ambiguous items— were chosen (Appendix A) according to three main criteria. First, in terms of adult ratings on a 6-point scale (with 1 being “effortless” and 6 being “impossible”), non-ambiguous items were rated as more easily identified by adult raters (US $M = 1.25$, Hong Kong $M = 1.44$) compared to ambiguous items (US $M = 3.35$, Hong Kong $M = 3.32$). Second, in terms of children’s open-ended answers to the identification question (“What is this?”), non-ambiguous items were correctly identified by more preschoolers (on average 89% in the US and 86% in Hong Kong), compared to ambiguous items (on average 11% in the US and 27% in Hong Kong). Third, when asked to pair the item to one of two picture matches, preschoolers showed considerable consensus in their matches for non-ambiguous items (86% in the US and 81% in Hong Kong agreed on a given match). In contrast, preschoolers’ responses were more equally distributed across the two picture matches for ambiguous items (61% in the US and 53% in Hong Kong agreed on a given match). Taking into account the above results, children’s beliefs about the identity of the non-ambiguous items were expected to be relatively strong, and their beliefs about the identity of ambiguous items were expected to be relatively weak.

Procedure

Children were tested individually in a 10-minute session in a quiet area at their school. Two experimenters interacted with each child, following a standardized script (Appendix B). Each child sat next to the experimenter at a small table. On the table were

the computer game and a picture book used for probing the child's beliefs about the identities of ambiguous target items. Each session consisted of five steps:

Step One: Probing Prior Beliefs. In the context of picture book activity, children were probed for their initial beliefs about the ambiguous items. First, children were asked to categorize an easy warm-up item (a non-ambiguous cup) to put them at ease with the basic task before they tackled the unfamiliar items. Then, the four ambiguous target items were shown one by one, and children were asked to identify each one ("What is this?"), as well as to categorize the item by pairing it to one of two matches ("What is this a part of? The jacket or the car?")

If a child said "I don't know" on the identification question ("What is this?"), the experimenter said "Okay!" and moved on to the categorization question. If a child said "I don't know" or "Both" on the categorization question, the experimenter encouraged the child to take a guess and pick one of the matches.

Step Two: Introducing the Teacher. A second experimenter (known hereafter as the "teacher") entered the area carrying some work. The first experimenter (known hereafter as the "experimenter") acted surprised and apologetic at the teacher's appearance, and asked for the teacher's permission to share the space. This established the teacher's role and authority over the space. The teacher gave permission and made note of the computer game, commenting that she had previously played the identical game with her class. Before the teacher returned to her work, the experimenter introduced her as a teacher visiting from another school, and who taught children of the

same age as the participant. This step further established the teacher's social identity as well as her past experience with the game.

Step Three: Learning the Game. Next, children were shown the computer game and told the purpose of the session, which was to learn the game and to help make a video to help teach younger children about “different kinds of things and what they are used for”. With guidance from the experimenter on using the touch screen, children played a warm-up round consisting of three easy items. Then, they played the warm-up round again while being recorded, and reviewed the video with the experimenter. This step familiarized children to how the touch screen works, to the format of the computer game, and to their pedagogical role in the session.

Step Four: Receiving Testimony. After the warm-up round, the experimenter announced that there were four more rounds left in the game, but she had to leave the room to get a new recorder for the next round. She asked the teacher to accompany the child while the child practiced that particular round in the experimenter’s absence. The teacher sat next to the participant, and provided instructions based on the start screen of that particular round (e.g., "In this round, you need to match the buttons with the jacket, and the wheels with the car."). Each round consisted of three items, which appeared consecutively on the top center portion of the screen. On the appearance of each item, the teacher asked, "Where do you think this X goes?" and fixed her gaze at the object in order to minimize social cues. Each time, children selected one of the two matches appearing on the bottom half the screen.

As described before, in each round, the first two items were standard items that were typical exemplars of either category, and the third one was always the target item. All standard items were non-ambiguous and received labels that aligned with children's expectations. Crucially, the target items received labels that either aligned or conflicted with children's expectations.

The Non-ambiguous condition presented *non-ambiguous* target items that were labeled by the teacher in ways that *conflicted* with children's prior beliefs (e.g., "Where do you think this wheel goes?" when the item was overwhelmingly perceived as a button in pilot work by both adults and preschoolers). The Ambiguous condition presented *ambiguous* target items that were labeled by the teacher in ways that *conflicted* with individual children's responses during the picture book activity (e.g., "Where do you think this wheel goes?" if the individual child had earlier called the item a button or paired it with the jacket.) The Control condition presented a combination of non-ambiguous and ambiguous target items that were labeled by the teacher in ways that *aligned* with children's prior beliefs. In all three conditions, regardless of children's categorization decisions, the teacher responded neutrally (e.g., "With the jacket, okay!")

Step Five: Teaching Younger Learners. After the child categorized the target item, the experimenter came back with a new recorder and thanked the teacher. The teacher returned to her work briefly and left the room. In the teacher's absence, the participant played the same round one more time and were reminded that they were being recorded to help teach younger kids how to play the game. When the recording

was completed, the experimenter introduced the next round and indicated her need to get another new recorder. At this moment, the teacher entered the room (with some more work) and was invited to help the participant practice again. Steps Four and Five were repeated until all four rounds were completed in the teacher's presence and recorded in the teacher's absence. The order of the four rounds as well as the location (left vs. right) of the picture matches on the computer screen were counterbalanced. Children were thanked for their help and, if permitted by the school, were offered their choice of sticker as a reward.

Measures of Standardization

Although the current protocol was designed to constrain the interaction among the experimenter, the teacher, and the participant, there was some room for spontaneity on the part of the participant. Thus, specific measures were developed to keep participants' experiences as uniform as possible. For example, a child might express doubt or disagreement verbally when the teacher provided an unexpected label. In this case, the teacher repeated the test question: "Where do you think this X goes?" If a child were to persist in protesting, the teacher responded by saying, "Where do you think it goes?" to leave some pragmatic freedom for the child to pick his or her own answer. Alternatively, in the teacher's absence, a child might express uncertainty about a target item to the experimenter (e.g., "But what's this?") When this occurred, the experimenter responded neutrally by reiterating "Where do you think it goes?" or by saying "Whatever you think." Although children were not specifically prompted to

say anything during the computer game, spontaneous comments formed a rich source of data for understanding what went on in children's minds as they attempted to reconcile unexpected testimony from a teacher with their own prior beliefs.

Results

Results are based on the behavioral patterns of 40 preschoolers, including 32 who participated in the Ambiguous and Non-ambiguous conditions, for which teacher testimony was in conflict with their prior beliefs, and eight who participated in the Control condition, for which teacher testimony confirmed their prior beliefs.

Proportion of Endorsement of Unexpected Labels

There was little variation in the Control condition. As predicted, when a teacher's labels confirmed their prior beliefs, preschoolers persisted in their prior beliefs on average 94% of the time, with only two children departing from their prior beliefs on just a single trial. Children's answers stayed consistent in the teacher's presence and in the teacher's absence, with no spontaneous switching between options even though they were categorizing the same items twice. These results suggest that children were responding thoughtfully to the computer game and their pedagogical role. Thus, the remainder of the analyses focused on the Ambiguous and Non-ambiguous conditions.

Preliminary analyses showed no effect of gender on children's endorsement patterns, so the following results were collapsed across boys and girls. A mixed model analysis of variance with a dependent measure of endorsement, a within-subject factor

of social context (in the teacher's presence vs. absence), and a between-subjects factor of condition (Ambiguous vs. Non-ambiguous) was performed, yielding a main effect of condition, $F(1, 30) = 4.91, p < .05, \eta_p^2 = .14$. A main effect of social context was also found, $F(1, 30) = 9.48, p < .01$, and will be discussed in a separate section below.

As shown in Figure 2.1, in the teacher's presence, preschoolers endorsed unexpected labels for ambiguous items on average 83% of the time ($SD = .20$), exceeding what would be expected by chance, $t(15) = 6.62, p < .01$. Thus, when deciding about ambiguous items, preschoolers were quite willing to abandon their prior beliefs to go with the label suggested by a teacher. For items that were non-ambiguous, preschoolers endorsed unexpected labels on average 69% of the time ($SD = .26$), also exceeding what would be expected by chance, $t(15) = 2.99, p < .01$. In other words, even though preschoolers endorsed fewer of the unexpected labels for non-ambiguous items than they did for ambiguous items, they were still surprisingly willing to abandon their prior beliefs and endorse what a teacher suggested. Thus, results show that in the physical presence of a teacher in a school setting, preschoolers were able to adapt their level of trust in unexpected testimony in relation to the strength of their prior beliefs. However, preschoolers were surprisingly trusting in unexpected labels even for objects about which they held strong intuitions.

Reaction Times

The next analyses focused on the length of time preschoolers took to determine the categories of target items in the teacher's presence. Recall that there were four

rounds each containing three items — two standard items and one target item. The reaction times (RT) for the second standard items were averaged to produce a mean baseline RT for each preschooler. Similarly, a mean target RT was calculated by averaging the length of time that preschoolers took to determine the categories of target items.

A mixed model ANOVA with a dependent measure of RT, a within-subject factor of trial type (baseline vs. target), and a between-subjects factor of condition (Control vs. Ambiguous vs. Non-ambiguous) was performed (Figure 2.2). There was a marginal interaction of RT and condition, $F(2, 37) = 3.12, p = .056, \eta_p^2 = .14$, which suggested that the relative times taken to categorize target vs. baseline items differed by condition.

Planned comparisons revealed that it was specifically when unexpected labels were about non-ambiguous items that preschoolers took a significantly longer time to categorize target items ($M = 2191\text{ ms}, SD = 1390\text{ ms}$) compared to baseline items ($M = 1332\text{ ms}, SD = 777\text{ ms}$), $F(1, 37) = 8.19, p < .01, \eta_p^2 = .18$. In contrast, the mean duration for categorizing baseline vs. target items were not significantly different in the Control and Ambiguous conditions. This was no surprise for the Control condition, in which both standard and target items were given expected labels. In fact, preschoolers in the Control condition showed a practice effect, responding faster to the Target items ($M = 1105\text{ ms}, SD = 768\text{ ms}$) than to the Standard items ($M = 1502\text{ ms}, SD = 1019\text{ ms}$), which appeared earlier in each round.

At the same time, to find no significant differences in RT for the Ambiguous condition (baseline $M = 1226\text{ ms}$, $SD = 614\text{ ms}$; target $M = 1423\text{ ms}$, $SD = 877\text{ ms}$) was somewhat surprising, because the target items received unexpected labels (i.e., labels that ran counter to children's beliefs in the picture book activity). Perhaps 4-year-olds were so uncertain and non-committal about their own prior beliefs that they did not spend further time evaluating the teacher's labels, which, though unexpected, were readily accepted.

Spontaneous Comments

Finally, in order to understand the ways in which preschoolers apprehended a teacher's testimony, all spontaneous comments made in response to unexpected labels for the target items were coded and analyzed, with the exception of the following: 1) Comments that were unrelated to the pictures in the game (e.g., "click, click") or that referred to one of the two picture matches as direct answers to the teacher's question. An example of a direct answer is when a preschooler responded to "Where do you think this button goes?" by touching a picture match and saying, "With the jacket." 2) Comments that simply reiterated the rule of the round. An example of a rule reiteration is "a button, goes with the jacket." 3) Fillers and ignorance cues including "Um..." and "I don't know." Though fillers and ignorance cues were of potential interest as signals of uncertainty, they were more difficult to interpret precisely. The present analysis focused on the set of spontaneous comments remaining after the exclusion the above types of comments.

The frequency of spontaneous comments was compared across conditions. Out of the 59 comments observed across the 40 participants, 43 were produced in the Non-Ambiguous condition, 15 in the Ambiguous condition, and 1 in the Control condition. A one-way ANOVA comparing the mean numbers of comments per child by condition revealed significant differences, $F(2, 37) = 9.41, p < .01$. In the Control condition, when a teacher labeled an item in a way that confirmed prior beliefs, preschoolers made virtually no communicative attempt ($M = .13, SD = .35$), with only one child making a single remark (“That’s a little table!”) on one round out of the four. In comparison, preschoolers made more comments when they encountered unexpected labels for ambiguous items ($M = .94, SD = 1.29$) and even more for non-ambiguous items ($M = 2.75, SD = 2.05$). Further, although both conditions presented testimony that conflicted with prior beliefs, preschoolers made significantly more comments when the unexpected labels were for non-ambiguous items than when they were for ambiguous items, $F(1, 30) = 8.97, p < .01$. Thus, the data suggest that preschoolers were sensitive to the varying need to reconcile unexpected testimony via verbal communication, be it to elicit clarification (e.g. US-PreK-04: “*This is...a toothbrush?*”), to reason (e.g., US-PreK-31: “*That looks dark and it has four dots on it so it looks like a button*”), to doubt (e.g., US-PreK-09: “*This doesn't look like a wheel*”), or to assert their own beliefs (e.g., US-PreK-32: “*I call them socks.*”), and particularly about the target items. As shown also in past work (e.g., Jaswal, 2004), children’s spontaneous comments provide a window into the kinds of metacognitive activity that preschoolers engage in even at their young age, in order to reconcile what they see, what they believe, and what they are told.

Addressing Potential Confounds

Amount of Testimony Received. Recall that in an effort to keep the interaction between teacher and the preschooler as uniform as possible, if preschoolers made a spontaneous comment or paused for a long time before making a touch screen response, the teacher repeated the test question once (e.g., “*Where do you think this button goes?*”). Thus, some participants heard the object label twice, whereas others heard it only once. It is, thus, possible for preschoolers’ categorization decisions about the target items to be influenced by the number of labels that they heard.

In order to address this possibility, I examined whether children’s endorsement patterns differed based on the number of labels that they heard. Of the 160 total instances of object labeling in this study, 128 instances involved one label. The number of labels elicited from the teacher was tabulated against preschoolers’ categorization decision, that is, whether they categorized a target item based on their prior belief or the unexpected label. Results showed that preschoolers’ endorsement of the teacher’s label did not differ based on the number of labels they heard, $\chi^2(2, N = 159) = .35, p > .5$. Therefore, at least in the range of one vs. two labels, there did not appear to be a relationship between amount of testimony received and whether the testimony was ultimately endorsed.

Trust, Social Compliance, or Failure to Remember. The findings thus far show that in the teacher’s presence, children adopted the teacher’s labels at above chance levels when categorizing both ambiguous and non-ambiguous items, despite the conflict

between the labels and their prior beliefs. At the same time, it was unclear whether children were simply complying with the social demands of the teacher, or if they were willing to consider the labels as true and conventional names for the target items. To address this, we analyzed children's likelihood of passing on a teacher's unexpected labels when they themselves became "teachers". Recall that in this paradigm, after practicing one round in the teacher's presence, children played the same round again in the absence of the teacher and with the pedagogical stance of "helping teach younger kids how to play the game." Comparing children's judgments in the teacher's presence vs. absence offers insight into the *scope* of children's apparent endorsement of the teacher's label. In other words, in the absence of the informant, did children retain and pass on a teacher's unexpected labels, or did they revert to their original intuitions?

As stated earlier, a mixed model ANOVA revealed a main effect of social context, $F(1, 30) = 9.48, p < .01$, but the interaction of context and condition was not significant, $F(1, 30) = .77, ns$. Preschoolers showed a pattern of endorsing the teacher's unexpected labels in her presence but reverting to their prior beliefs in her absence. Nonetheless, planned comparisons suggested that the effect of social context was in fact carried by preschoolers' reversion to prior beliefs for the non-ambiguous items, $F(1, 30) = 7.84, p < .01, \eta_p^2 = .21$, for which their testimony endorsement dropped from 69% to 55%. In contrast, preschoolers' endorsement of unexpected labels for ambiguous items dropped by a smaller extent, $F(1, 30) = 2.42, ns$. Furthermore, note that even for non-ambiguous items in the teacher's absence, preschoolers still endorsed unexpected testimony over

half of the time. This was surprising when considering the non-ambiguous nature of the items, which preschoolers had no trouble identifying on their own.

Analyzing the effect of social context suggests that preschoolers' frequent endorsement of a teacher's unexpected labels may have involved a degree of social compliance. Alternatively, because the pedagogical event always occurred around one minute after the labeling event, the drop in endorsement might have simply reflected preschool-aged children's failure to remember the teacher's labels by the time they categorized a second time. A follow-up study was conducted to address this possibility.

Study 1B: Did children remember unexpected labels in the teacher's absence?

Participants. Sixteen 4-year-olds ($M = 4;6$, 16 boys and 16 girls) participated in a follow-up memory condition. Children were recruited from two preschools in southeast Michigan, and were tested individually at their schools by an experimenter. None of these children had any prior exposure to the computer game and its contents. As was done in Study 1, children were randomly assigned into view either ambiguous target items, or non-ambiguous target items.

Procedures. The procedure in the memory condition was identical to the one described in Study One, with one key exception. After the teacher left the room and immediately before children demonstrated the game to teach younger children, the experimenter said, "Now let's see if you remember what Miss X called these things." Laminated color versions of the three items from the given round were presented one by one to the preschoolers, accompanied by a memory question (e.g., "Did Miss Sara

call this a wheel or a button?”) The three pictures were shown in the same order as in the computer game. However, the order of the two labels in the memory question was counterbalanced (“wheel or button” vs. “button or wheel”) to control for the potential tendency of preschoolers to simply pick the most recent label they heard.

Results. In both conditions, all preschoolers recalled all of the labels for the Standard items, which the teacher named in a manner conforming to prior belief. Also, in both conditions, preschoolers’ recalled the teacher’s labels that conflicted with prior belief more frequently than would be expected by chance, although their memory of labels for ambiguous items was better ($M = .88$, $SD = .13$, compared to $M = .66$, $SD = .33$). A closer look at the data revealed that preschoolers’ successful recall of the teacher’s labels depended on their endorsement of the label in the teacher’s presence. In other words, preschoolers who categorized an object according to a teacher’s unexpected label were more likely to remember this label after a short delay, compared to those who did not adopt the unexpected label in the first place, $\chi^2(1, 64) = 27.18$, $p < .001$. Out of the 49 instances in which children adopted a teacher’s label, they recalled the label correctly 45 times. In contrast, out of the 15 instances in which children rejected a teacher’s label, they recalled the label correctly only four times. The mean proportion of trials on which preschoolers failed to recall unexpected labels after initially endorsing them was the same for ambiguous ($M = 0$, $SD = .13$) and non-ambiguous ($M = 0$, $SD = .33$) items, and did not differ from zero in either case. In other words, regardless of the condition, children who had endorsed unexpected labels in the teacher’s presence tended not to forget those labels when later probed. Therefore,

preschoolers' reversion to their prior beliefs in the teacher's absence was not simply due to memory failure. The current data suggested that preschoolers were likely to remember the unexpected labels that they had endorsed, at least after a short delay. Conversely, it was possible for preschoolers, when removed from the social demands of a teacher's presence and placed in a more "consequential" context (of teaching others and being videotaped), chose to pass on their own beliefs about the items.

Discussion

Study 1 explored the way in which the strength of prior beliefs related to children's endorsement of a teacher's expected and, in particular, unexpected labels. First, consistent with predictions and past research, preschoolers who heard expected labels continued to categorize items based on their prior beliefs, but preschoolers who heard unexpected labels showed a bias to categorizing items based on the teacher's labels. Second, the frequency of endorsing unexpected labels differed by the strength of prior beliefs: preschoolers were more likely to categorize items based on unexpected labels for ambiguous items than they were for non-ambiguous items. Parallel data based on reaction times and spontaneous comments converged to suggest that children were cognitively engaged with the unexpected labels. In particular, when unexpected labels were provided for non-ambiguous items, children took a longer time to categorize those items and made more spontaneous comments. Third, on a small percentage of the time, children reverted to their prior beliefs in the teacher's absence and did not endorse the unexpected labels (that they had endorsed in the teacher's presence) in a pedagogical

situation. A follow-up study of preschoolers' memory of a teacher's unexpected labels indicated that the reversion to prior beliefs was unlikely to be explained by a simple memory failure. Instead, the reversion may reflect an effort to provide correct answers when the context seemed more consequential, such as when their answers were being recorded for teaching younger children.

One surprising finding was preschoolers' frequent endorsement of a teacher's unexpected labels in their categorizations of *non-ambiguous* objects, both in the presence of the teacher (69%), and in a pedagogical stance (55%). In other words, even when preschoolers' prior beliefs about target items were relatively strong, they were willing to trust in unexpected testimony from a teacher. The fact that children were willing to pass on the labels in their demonstrations for younger children suggests that preschoolers were willing to consider the labels as potentially true. This was surprising in consideration of the emphasis on individuality, on choice, and on verbal expression that appear so salient in American preschools (Tobin, Hsueh, & Karasawa, 2009).

Nevertheless, this result makes more sense in light of recent evidence of how strongly children are biased to trust in other people's testimony. For example, in the work on gravity bias (Jaswal, 2010, Study 2), despite having seen or heard an object land in a given location, 2.5-year-olds were still misled by an adult's claim that the object was in alternate location. Furthermore, 3-year-olds have been found to persist in trusting in the testimony of an informant who was repeatedly incorrect or reported to be malevolent (Mascaro & Sperber, 2009; Vanderbilt et al., in press), and particularly when

testimony was given verbally and the informant was visibly present (Jaswal et al., 2010). At the same time, 4-year-olds have generally demonstrated an ability to override the bias to trusting in testimony when the testimony appeared to be misleading. In other words, by the age of four, children started to show more flexibility in their trust, trusting in testimony only when appropriate. For example, when children were asked to categorize hybrid items that received unexpected labels (Jaswal, 2004), 4-year-olds endorsed those labels in their categorization only 41% of the time, below chance levels. In comparison to the hybrid items (which combined features of two categories but looked more like one category than the other) used in Jaswal (2004)'s study, the non-ambiguous items used in the present study were even more straightforward. Thus, if the non-ambiguous items were used in Jaswal (2004)'s design, then one would expect children to endorse unexpected labels *less frequently* than 41% of the time. Conversely, children in the present study endorsed unexpected labels 69% of the time. What might have led to the heightened level of trust demonstrated by the preschoolers in this study?

It is proposed that the heightened trust in the present study was due in part to the nature of the task context. Specifically, the unexpected labels were provided in the familiar ecology of children's own schools by a person introduced as a teacher. The combined cues of the physical environment and the informant's status as a teacher may have primed children to behave as they normally would in an instructional setting, in which teachers are committed allies in their learning and growing. In contrast to some previous work, the informant in this study did not appear ill-intentioned or malevolent;

nor were unexpected labels juxtaposed against better alternatives from a second informant. Importantly, children did not receive any feedback about the accuracy of the teacher's unexpected labels.

In a sense, the current task was more challenging than those presented in previous work, because there was no external cue (such as the reported trickiness of an informant, or a second informant who provided better alternatives) that clearly specified an optimal response for "passing" the task. However, I propose that the characteristics of the current task are, in fact, common to children's everyday learning experiences. First, teachers are well-intentioned and want to help children learn. Second, the younger the children, the more it is likely for them to hear testimony from their teachers that do not cohere with their pre-existing beliefs; at such times, there is often no second informant or alternative version of the information available. Third, children do not receive continual feedback on the veracity of what they are told. What the present data suggest is that when entrenched in this context, 4- year-olds are still likely to endorse a teacher's testimony even when their prior beliefs are strong. At the same time, children do not "blindly" accept unexpected testimony. Converging measures suggest that preschoolers do make an attempt at acknowledging or reconciling the conflict, as revealed in children's longer response times and larger number of spontaneous comments for the non-ambiguous items.

At the same time, children were more likely to endorse unexpected labels when the teacher was present than when she was absent. This difference was greatest when

the target items were non-ambiguous, that is, when preschoolers were more certain about their prior beliefs. In a study that looked at young children's tendency to conform to the majority in a simplified version of the classic Asch task (picking the longest line out of three), 3- and -4-year-olds were reported to conform to the inaccurate consensus instead of relying on their own perceptual judgment about a third of the time (Corriveau & Harris, 2010). Interestingly, when the task was recast in a more consequential frame (selecting the longest plank to build an adequate bridge), they reverted to their own prior beliefs. The authors described preschoolers' initial conformity to adult beliefs as reflecting a socially driven mode of response or a kind of "respectful deference". This respectful deference might have also been at play in the current study, on the minority of trials in which children first endorsed unexpected labels and then reverted to their own beliefs. Nonetheless, despite some degree of social compliance, preschoolers were still willing to endorse over half of the unexpected labels for non-ambiguous items when demonstrating the task for younger learners.

To summarize, this study showed that by four years of age, children differed in how much they endorsed unexpected labels based on the strength of their prior beliefs. Reaction times and spontaneous comments suggested that children were not simply accepting unexpected labels in the same way as they did for expected labels, but were actively engaged in reconciling the conflict. On a minority of the trials, and particularly for non-ambiguous items, children's endorsement of unexpected labels might have reflected social compliance. However, children still endorsed unexpected labels over half of the time even when their prior beliefs were strong.

It will be important, therefore, to examine whether and how this surprisingly high level of endorsement in unexpected labels, as well as the effect of social context, might differ across development. In particular, to what extent do older children trust in unexpected testimony? And to what extent do older children show a respectful deference to teachers who tell them something unexpected? Finally, it is interesting to explore how children's patterns of trust and social compliance might differ in other cultural contexts, especially those that contrast in terms of general assumptions and expectations related to learning and teaching. Although children in the US are encouraged to be independent, self-expressive, and free to make their own choices, not every culture emphasizes the same values (see Tobin et al., 2009, for a detailed illustration). For example, learners in traditionally Confucian cultural contexts may be socialized to be mindful and respectful of others, to show modesty (Kulkofsky & Wang, 2006), and to be more accepting of their parents' control (Pomerantz & Wang, 2009). How, then, might children's trust in unexpected testimony be influenced by the values emphasized in their cultures and socialization experiences? To begin to address these questions, Study Two looked across development and across cultures by examining kindergartners' and second graders' trust in relation to the strength of their prior beliefs in the US and in Hong Kong.

Chapter III

Study 2: Trust in Testimony across Development and Cultures

Study 1 portrayed 4-year-olds endorsing unexpected labels for ambiguous items more frequently than they did for non-ambiguous items, suggesting that by age four, children are able to adapt their trust in unexpected testimony in relation to the strength of their prior beliefs. What might older children do? In Study 2, the first goal was to adapt the experimental paradigm in Study 1 for kindergartners and second-graders. The second goal was to explore what children's trust in testimony looked like in a cultural context that held different expectations and experiences regarding how children should learn from others.

The Developmental Question

Several factors motivated the focus on development. First, it was worth examining whether the influence of prior belief would be replicated in older children. Although it is likely that children's metacognitive skills (including their sensitivity to the strength of their prior beliefs) improve as they grow older, it is unclear whether and how this might affect their trust in unexpected testimony. Specifically, would increased metacognitive skills enable children to show more *differentiated* trust, with greater

endorsement of unexpected labels for ambiguous items, and/or less endorsement of unexpected labels for non-ambiguous items? Or, would older children become more certain about all of their beliefs, resulting in a general decrease (regardless of item ambiguity) in their trust for unexpected testimony?

Taking into account that even adult raters in pilot testing found the ambiguous items more difficult to categorize, older children were expected to remain uncertain about the ambiguous items, and to endorse unexpected labels from a teacher at above chance levels. Predictions regarding the non-ambiguous items followed two main lines of reasoning. Both concerned potential contributors to the surprisingly high level of trust demonstrated by the 4-year-olds in Study 1. First, if 4-year-olds' high levels of trust reflected an early bias to trusting in testimony, then one would expect decreased levels of endorsement in older children. Because pilot work showed non-ambiguous items to be easily identifiable by young children, it was unlikely for 4-year-olds to endorse the conflicting labels due to uncertainty about the items. Instead, 4-year-olds seemed prone to go with what the teacher asserted to be true, echoing the robust bias towards trusting in testimony documented by laboratory studies with 3- and 4-year-olds (Jaswal et al., 2010; Vanderbilt et al., in press). In these studies, when testimony was explicitly presented as part of the research session, children up to the age of three persisted in their trust in verbal testimony from a tricky or unreliable speaker. It was likely that, when testimony was entrenched in an everyday ecology of learning (as in the current design), even 4-year-olds were ready to accept new and surprising information imparted

by a teacher. However, kindergartners and second-graders were expected to override this early-occurring bias and to categorize based on their own prior beliefs.

Alternatively, one might attribute 4-year-olds' high level of trust to the type of items presented in the computer game. All the items were man-made artifacts, such as buttons and wheels. Recent work suggests that young children may view artifact categories as being more conventionalized and possessing more flexible boundaries, when compared to certain other categories such as animals (e.g., Rhodes & Gelman, 2009). In particular, young children are more willing to accept the possibility that an artifact (in comparison to an animal) of one category could belong to another, when primed to think about a hypothetical community where individuals did things differently. Indeed, for the present study, using animal exemplars might present an even stronger test of children's trust in unexpected testimony. However, children in the US are generally engaged in richer and positive experiences with animals via their homes, schools, neighborhoods, and media compared to children in Asian societies (Gray & Young, in press; Melson, 2001). Therefore, to attain higher cross-cultural equivalence in children's initial familiarity with the stimuli, the computer game presented artifacts that virtually all children growing up in industrialized societies would encounter.

Testing children older than four may shed light on the competing possibilities. If categorical flexibility were the reason behind 4-year-olds' high level of endorsement in the Non-ambiguous condition, then older children, who tend to be more flexible about category boundaries for artifacts (Rhodes & Gelman, 2009), should show an *equal* or

higher level of endorsement. Alternatively, if the 4-year-olds' trust behavior reflected an early acquired, robust bias to testimony, then one would expect this bias to be attenuated at older ages, resulting in a *lower* level of endorsement. Thus, looking across ages not only accounts for a more extended developmental trajectory, but also helps us interpret 4-year-olds' surprisingly high trust in unexpected labels for non-ambiguous items found in Study 1.

The Cultural Question

The focus on culture was motivated by recognizing testimony as a transaction that is as social as it is cognitive. In particular, the current experimental design pits testimony presented by another person against the prior beliefs of the *self*. Involvement of the self suggests that children's behavior in this type of learning context may be influenced by the ways in which they are socialized to construe themselves as individuals and as learners. Interestingly, research has shown that the socialization of self-construal may operate differently across cultures. Study Two presents a comparison between US and Chinese children's endorsement behavior, in order to identify the aspects of children's trust in testimony that are universal, and the aspects that are relatively malleable and culture-specific.

Independent and Interdependent Self-Construal. A rich history of research by psychologists, educators, and ethnographers documents characteristics of Chinese culture and individuals that motivate the current focus on Chinese children. First, laboratory experiments have shown that, in comparison to US adults, Chinese adults

have a more holistic view of the world, paying greater attention to relationships and the context rather than focal objects or individuals (Masuda & Nisbett, 2001). These tendencies have been demonstrated in a variety of cognitive tasks. Some of these tasks tapped one's perception: whereas US participants were better able to detect changes in the focal objects in a scene, Chinese participants were better able to detect changes in the background of a scene (Nisbett & Masuda, 2003). Some of these tasks tapped one's concepts and categories: Chinese participants preferred to pair a picture of a cow to a picture of grass (showing an attention to relations) rather than to a picture of a hen (showing attention to category membership), with US participants showing the reverse pattern (Ji, Zhang, and Nisbett, 2002).

More pertinent to an investigation of trust in testimony is that these tendencies are manifested *socially*, in terms of an interdependent construal of the self embedded in and dependent on social surroundings (Kitayama, Duffy, & Uchida, 2007; Markus & Kitayama, 1991). American children may more often be socialized to construe the self as independent, perceiving the need to distinguish oneself from other people, and to act autonomously to achieve one's personal goals and desires. Chinese children may more often be socialized to construe the self as interdependent, perceiving the need to blend harmoniously with other people, as well as to factor the situation and other people's evaluations into one's decisions and behavior. These general patterns have been given support by empirical studies that show, for example, Chinese participants to be more situation-dependent in their emotions and behavior compared to their Western counterparts (Stipek, 1998), and in turn, to perceive other people's behavior as being

similarly situational (Morris & Peng, 1994). Theories have been proposed for how these different tendencies across cultures came about (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009; Nisbett, 2003; Tweed & Lehman, 2002), but a crucial point for the present discussion is that independence and interdependence are not mutually exclusive, and how the two are balanced may be activated by the specific routines, tasks, and experiences in which a person engages. These routines, tasks, and experiences can be fleeting such as a manipulation in a priming experiment, situational such as participating in an individual sprint versus a team relay, or enduring such as everyday routines and repeated experiences afforded by the cultural context. In particular, cultural contexts lead to enduring and embodied self-construal, and cultural differences in mean self-construal have been connected to a variety of other behavioral outcomes (e.g., Aaker & Lee, 2001; Kitayama et al., 2009). In the following section, I focus on how independent and interdependent self-construal can be manifested in US and Chinese learning contexts on *two different levels*, and each level can give rise to unique predictions about children's trust in testimony. The first level concerns how children may be socialized to be independent, *Socratic* learners versus interdependent, *Confucian* learners in the way they communicate with and relate to a teacher. The second level concerns how children may be socialized to be independent, *promotion-focused* learners versus interdependent, *prevention-focused* learners in their motivation to achieve academically.

Socialization as Socratic and Confucian Learners. The first level concerns how people in US and Chinese cultures are socialized to present and conduct themselves as

learners in relation to the teacher. Taking into account the general portrayals of independent North Americans as being more motivated to promote their self-esteem and of interdependent Asians as being more motivated to maintain harmonious social relations (Kitayama, Mesquita, & Karasawa, 2006), it follows that US adults may be less accepting of testimony that runs counter to their own beliefs (thus avoiding a threat to self-esteem), and Chinese adults may be more willing to accept or comply with another person's different point of view (thus avoiding a threat to social relations).

Supportive evidence can be found in past research on US and Chinese students' beliefs about learning. In the US, beliefs about learning tend to emphasize the mind, with active engagement, thinking, inquiry, and communication being central processes that enable one to develop expertise in the field, to arrive at creative, personal insights, and to be the best one can be (Li, 2005; Li & Fischer, 2004). This is in fitting with a *Socratic* approach to learning, in which learners are encouraged to generate their own hypotheses and question other people's beliefs (Tweed & Lehman, 2002). In contrast, and in fitting with a *Confucian* approach to learning, Chinese learners are expected to listen attentively and to question only after they have understood others, with an attitude of humility, respect, and obedience toward the teacher (Li, 2001, 2003; Li & Fischer, 2007). To illustrate, when Western teachers working in Hong Kong were asked to reflect on their teaching experiences, Western teachers often characterized Chinese students as quiet, receptive, and disinclined to challenge authority (Pratt, Kelly, & Wong, 1999). Chinese teachers, in turn, are perceived as moral examples and holders of authorized knowledge (Chan & Elliott, 2004). These portrayals suggest differences

between US and Chinese ecologies of learning such that it may be relatively normative for learners to question or reject a teacher's beliefs in the US, and relatively normative for learners to be receptive to a teacher's beliefs in Chinese societies.

Extending these observations to the current study, US children are expected to be more assertive about their own beliefs and Chinese children to be more deferent to what a teacher says. Therefore, when a teacher provides unexpected labels about items in the computer game, Chinese children are predicted to show higher endorsement than their US peers, in both Ambiguous and Non-ambiguous items. At the same time, because Chinese children are more likely to endorse labels out of the obligation to show respect to the teacher figure, they are predicted to also more frequently revert back to their own prior beliefs when the teacher is away. Across development, as classroom contexts become more structured and what is normative is more clearly manifested, the differences between US and Chinese children may become more pronounced in the older than the younger children (second grade > kindergarten > preschool).

Nonetheless, independent and interdependent self-construal may be manifested in the learning context in manners that go beyond how learners present themselves and communicate with others. A closer reading of the literature, in particular the work on regulatory focus (e.g., Higgins, 1987; Molden & Miele, 2008) and academic achievement (e.g., Stevenson & Stigler, 1994; Stevenson & Lee, 1990) reveals a more complex picture giving rise to an alternate set of possibilities.

Promotion vs. Prevention Focus in Achievement Motivation. The second level at which independent and interdependent self-construal may be manifested in learning concerns children's tendency to be promotion-focused or prevention-focused in their motivation to achieve academically. The distinction between a focus on promotion, characterized by maximizing gains, versus a focus on prevention characterized by avoiding losses in one's behavior was first proposed in regulatory focus theory (Higgins, 1987), and has been applied to interpret and predict the ways in which people pursue their goals. For example, studies have shown that as learners, promotion-focused individuals tend to be more eager, risky, and open to alternatives, whereas prevention-focused individuals tend to be more cautious, monitoring their performance more closely for accuracy (Friedman & Forster, 2001). In a given learner, a focus on promotion versus prevention may be activated by temporary incentives, but it may also be shaped more chronically via one's socialization and cultural environment. Relevant to this discussion, past work has shown that cultures emphasizing independence tend to reinforce a focus on fulfilling hopes and aspirations, whereas cultures emphasizing interdependence tend to reinforce a focus on sanctions and loss avoidance (Lee, Aaker, & Gardner, 2000). Connecting these tendencies to academic motivation, when children are rarely criticized for their poor performance and heavily praised for their good performance, their motivation to perform well is driven by the focus on promoting positive outcomes. In contrast, when children are frequently criticized for their poor performance and rewarded for their good performance by the withdrawal of such criticism, their motivation to perform well is driven by the focus on preventing negative

outcomes (Molden & Miele, 2008). These contrastive patterns can be found in the experiences of US and Chinese children as they are socialized to achieve academically.

Differences in socialization experiences find their roots in the extent to which institutionalized, academic learning is prioritized in Chinese culture, in comparison to US culture. Regardless of socioeconomic status, Chinese caregivers feel obliged to sacrifice to secure education opportunities for their children (Cheng, 1996). Chinese parents also hold higher expectations for and are more willing to invest in their children's academic performance (Stevenson, Chen, & Lee, 1993; Stevenson & Lee, 1990; Stevenson & Stigler, 1994). For example, families in Chinese societies are more involved in helping children with their homework and exam preparation; as much as possible, the daily experiences of a child (and often of the parents) tend to be structured around activities that promote children's school performance (e.g., advanced tutoring to get ahead of the grade curriculum), and tend not to include activities that do not have a clear relationship to academic prospect (e.g., visiting local museums). As children progress through elementary school, Chinese mothers tend to raise their standards accordingly and are slow to express satisfaction, whereas US mothers become less demanding and tend to overestimate their children's performance (Stevenson & Lee, 1990). Although the practices of Chinese parents may seem harsh and controlling in the US context, they are normative in the Chinese context, embedded in a coherent web of parenting constructs such as training and shaming (Chao, 1994; Fung, Lieber, & Leung, 2003). In these ways, Chinese learners are socialized to place disproportionate attention and effort on performing well academically. Furthermore, social, pragmatic, and cognitive

factors conspire to reward and reinforce Chinese learners' "heart and mind for wanting to learn" (Li, 2002). Socially, performing well may be a means of honoring one's family and earning respect at school or among relatives. Pragmatically, it may open the door to a cascade of opportunities localized to and reserved for academic high achievers (Li & Wang, 2004; Pomerantz, Ng, & Wang, 2008). Cognitively, as young as four, Chinese children have been found to embrace a rich and culturally specific set of beliefs about the virtues of learning and to see achieving as a moral endeavor (Li, 2004a; Li, 2004b). These culturally specific learning beliefs continue to be elaborated through adolescence (Li & Yue, 2004) and young adulthood (Li, 2001, 2002).

Finally, the vigor with which Chinese cultures emphasize and embrace learning and academic achievement may be made possible by a fundamental belief in the importance of one's own effort. When asked to report the most important factor for their academic success, US fifth-graders focused on the availability of a good teacher, whereas Chinese fifth-graders focused on studying hard. Combined with the traditions of crowded classrooms (with around 40 students per class) and whole-class teaching formats that often characterize Asian schools (Stevenson & Lee, 1995), it may indeed be more critical to be a self-directed, autonomous learner than to rely on a good teacher. Indeed, classroom observations have portrayed how Chinese teachers "do not see themselves as the sole authorities of knowledge, explaining details when necessary but expecting children to generate their own solutions, only later calling on children to evaluate the accuracy of their answers" (Stevenson, 1993). Also, Chinese parents were found to emphasize self-reliance specifically in the domain of academics (Chao & Sue,

1996). A paradoxical picture emerges: at least in the realm of early academic training in which there often *were* right answers, independent US children (who typically have greater freedom to pursue non-academic areas) may depend more readily on their teachers, whereas interdependent Chinese learners (whose academic performance typically concerns far beyond the learner alone) accept greater responsibility for their own performance and may be more autonomous in their own learning.

However, the flip side of Chinese families' disproportionate emphasis on the academic domain is that failures as a learner, or poor academic performance, may be punished more severely and thus be more costly for Chinese learners. This has been suggested at several different levels. At the level of parents, despite achievement scores being higher in Chinese children than their US peers, Chinese mothers were less likely to report being satisfied with their children's academic performance than were US mothers (Stevenson & Lee, 1990). Moreover, whereas US fifth-graders reported that their parents tended to respond positively to their academic successes and to downplay their academic failures, fifth-graders in Hong Kong reported the reverse pattern: that their parents tended to respond less positively to their academic successes and to respond more negatively to their academic failures. At the level of learners, Chinese children themselves were less likely than their US peers to experience positive emotions when they succeeded and were more likely to experience negative emotions when they encountered failure (Ng, Pomerantz, & Lam, 2007, Study 1).

In addition, even in the context of a laboratory experiment that had no direct link to their school or their grades, parents of fourth- and fifth-graders in Hong Kong were observed to be more concerned about and involved in their children's performance on an intelligence test, spending more time during a 5-minute break between two tests to talk to their children about their performance and to go over the test together, in comparison to US parents, who were less likely to refer to the test during the same break. Furthermore, when children's scores on the intelligence test were manipulated to appear low, Chinese parents used five times as many negative statements as positive statements during the break, whereas US parents made the two types of statements equally often (Ng, Pomerantz, & Lam, 2007, Study 2). As a result, and aligning with a promotion vs. prevention focus in achievement motivation, chronically negative feedback to failure, or the tighter sanctioning of mistakes, may socialize Chinese learners to pay greater attention to their own and other people's accuracy, and emphasize an avoidance of mistakes, in comparison to US learners.

Extending this reasoning to the current study, Chinese children's performance in the categorization task may more likely be driven by a prevention focus and a greater vigilance against error. Thus, Chinese children were predicted to be less accepting of unexpected labels that seem unlikely to be correct (in the case of non-ambiguous items in which prior beliefs tend to be strong), even labels coming from a teacher. In comparison, US children's performance may more likely be driven by a promotion focus, which is associated with a greater openness to alternatives. Thus, US children were predicted to be more open to diverse beliefs and realities presented by others, and to

endorse unexpected labels from a teacher more frequently than their Chinese peers. Nonetheless, with ambiguous items, children in both cultures are expected to perform similarly US children, when uncertain, may even more consider another individual's beliefs as potentially true, and Chinese children, when uncertain, may depend on a teacher's claims as the best available route to a correct answer. Finally, by this account, the teacher's presence or absence are not predicted to significantly influence children's endorsement of unexpected labels.

Why Hong Kong children? Children in Hong Kong, a Chinese society with a British colonial history, were recruited for the cultural comparison due to important similarities and differences between growing up in Hong Kong versus in the US. On the one hand, the two contexts are comparable in terms of family composition with siblings as normative (the one-child policy does not exist in Hong Kong), an industrialized and westernized style of living, and a capitalist economic structure. Socialization experiences of children sampled in Hong Kong may be more stable and homogeneous compared to that of children sampled in mainland China, which has been undergoing rapid and large scale constitutional and economic changes in recent years. On the other hand, studies with US and Hong Kong participants have been robust in revealing differences at social and cognitive levels related to independent vs. interdependent self-construals (e.g., Bond & Cheung, 1983; Hwang, Francesco, & Kessler, 2003; Lee, et al., 2000; Oyserman, Coon, & Kimmelmeier, 2002; Pratt et al., 1999). Indeed, despite the more Westernized lifestyle resulting from Hong Kong's colonial history, traditionally Chinese cultural values have been reported as salient (Li & Fischer, 2007) including in the academic context (Y.

Li, 2006). Therefore, US and Hong Kong children offer a valid test of whether or not culturally specific values about what counts a “good” learner might play a role in children’s trust in unexpected testimony.

Method

Participants

Participants were 160 children attending kindergarten and second grade in the US and in Hong Kong. In the US, participants were 40 kindergartners ($M = 6;0$, 20 boys and 20 girls) and 40 second graders ($M = 8;1$, 21 boys and 19 girls) from five elementary schools in southeast Michigan. In Hong Kong, participants were 40 kindergartners ($M = 5;4$, 18 boys and 22 girls) and 40 second graders ($M = 7;8$, 17 boys and 23 girls) from four kindergartens and three primary schools. All participants had written consent from their parents, and were tested individually in a quiet room at their schools. Data on ethnicity collected from parental questionnaires showed that 96% of the US children were Caucasian and 100% of the Hong Kong children were of Chinese descent. Self-reported data on house size were collected as an estimate of socioeconomic status. The average house size for the US participants was 2,391 square feet, and the average house size for the Hong Kong participants was 524 square feet; both were comparable to local averages based on census data (US Census Bureau, 2009) or governmental report (Hong Kong Housing Authority, 2010). The average number of people living in the same household for the US and Hong Kong samples were 4.4 and 4.3 respectively, exceeding the average household sizes reported in census figures to a comparable degree.

Design and Procedures

The design, materials, and procedures were identical to those reported in Study One, with a few exceptions, as described below.

Entering and exiting the study room. First, in Study One, the physical layout of each preschool made it possible for the experimenter to listen in on the session without being seen and, as such, to know the appropriate time to re-enter the room. For Study Two, two changes were made in anticipation of the challenges presented by multiple school types and cultures, and by the more sophisticated sociopragmatic skills of older children. To allow quick adaptation to the unique physical infrastructure at each school, a wireless doorbell set to silent mode (with flashing LEDs) was used as a cue to help both the experimenter and the teacher enter the room at the appropriate time. Also, to ensure that children in both cultures perceived a teacher's absence in the same manner (in other words, for them to be convinced of the teacher's absence as opposed to thinking that she might be monitoring nearby), each time the teacher left the room, she announced explicitly her need to leave the room to do some work, instead of leaving her absence unexplained.

Building rapport prior to testing. Second, measures were taken to keep children's relative familiarity with the primary experimenter vs. the teacher as uniform as possible across ages and cultures. In Study One, researchers were required by all preschools to spend at least two hours in the classroom to build rapport with the children before inviting them to play a research game. The primary experimenter spent

at least three sessions in the classroom and made an effort to make friends with the children. The “teacher” kept to the minimum of two hours and simply observed in the classroom, maintaining a congenial presence while not initiating exchanges with the children. The primary experimenter and the teacher never built rapport in the same classroom at the same time. Overall, the rapport requirement was in our favor because it provided a chance for children to feel at ease with the primary experimenter prior to the research session, and to be convinced by the cover story (of the experimenter needing to get a new tape and inviting the nearby teacher to help them practice the game). However, kindergartens and elementary schools did not require researchers to spend time in the classroom before testing, and, in fact, most schools preferred that testing be completed as quickly as possible to minimize disruption. Thus, in order to standardize the amount and types of interaction between children and experimenters across ages, schools, and cultures, a procedure was implemented across two sessions that took place on separate days. On the first day, children were introduced to the primary experimenter and responded to open-ended questions about five hypothetical vignettes (Study 3). This provided a chance for children feel more at ease with the primary experimenter, who also engaged each child in conversation on their way to and from the research room. On the second day, as in Study 1, children played the computer game with the primary experimenter, received testimony from the unfamiliar experimenter who was introduced as a visiting teacher, and demonstrated the game to help teach younger children.

Adapting the protocol for second-graders. Pilot testing suggested that whereas the protocol used in Study 1 worked well for kindergartners, it was less successful in engaging second-graders, who were around 8 years of age and were much more advanced in their social, cognitive, and motor abilities (Sameroff & Haith, 1996). Therefore, several minor changes were made to the protocol to keep older children convinced by the cover story and engaged in the computer game.

Identical to Study 1, after children viewed the recording of themselves playing the warm-up round, the experimenter told them that there were four more rounds in the game. In contrast to Study One, at this point, a second experimenter entered with a message that made it necessary for the primary experimenter to leave the room (e.g., there was a phone call for her at the school office). When prompted, the second experimenter introduced herself as a teacher visiting from another school, and agreed to practice the game with the child while the primary experimenter was away. The primary experimenter passed on an instructions binder (in which the doorbell button and codes indicating the participant's prior beliefs about the target items) to the teacher. As in Study 1, the teacher provided labels for each item in the computer game using a question frame (e.g., "Where does this X go?"). Second-graders then practiced all four rounds with the teacher, before the experimenter returned and recorded all four rounds. This procedure avoided the multiple exits and entries of Study 1 that had worked well with younger children (who had to remember only one label at a time) but would have roused the suspicion of second graders.

Adapting the paradigm across cultures. The experimental protocol used with English-speaking children was adapted for use in with Cantonese-speaking children in Hong Kong via a series of translations and pilot work (Appendix B). First, a bilingual, bicultural researcher translated the original protocol in English into Cantonese Chinese. Based on this initial translation, a team of three undergraduate student researchers recruited from local Hong Kong universities (two of whom majored in education and had spent several months as visiting teachers in local elementary schools) acted out the scenario and identified changes at the wording level to make the protocol comprehensible and appropriate for young children. This was done across multiple sessions, with continual monitoring for equivalence with the original English version. Finally, the protocol was piloted with five kindergartners at their schools to identify any unforeseen issues, and was prepared for use with study participants.

Results

The key dependent measure was the mean proportion of trials on which children endorsed a teacher's unexpected labels for target items. Children were randomly assigned to the Ambiguous condition, in which they heard labels for ambiguous target items, or the Non-ambiguous condition, in which they heard labels for non-ambiguous items. Children's categorization responses and reaction times were recorded via the E-prime software, both in the teacher's presence and in teacher's absence. Comparisons were performed across two age groups and two cultural contexts. Based on digital recordings of the research sessions, children's spontaneous comments were also

transcribed and examined as a potential window into the process of cognitive conflict and reconciliation occurring in response to the teacher's unexpected testimony.

Omnibus analysis

Thirty-two children participated in a Control condition, which was used as a manipulation check, and served as a baseline for the Ambiguous and Non-ambiguous conditions. Across ages and cultures, participants persisted in their prior beliefs when a teacher provided *expected* labels for a combination of ambiguous and non-ambiguous target items. Children's answers stayed consistent in the teacher's presence and in the teacher's absence, with no spontaneous switching between options even though they were categorizing the same items twice. Children's uniform and normative behavior across ages and cultures in the Control condition suggested that they were responding thoughtfully to the computer game and their pedagogical role.

The remainder of the analyses focused on Ambiguous and Non-ambiguous conditions, in which a teacher provided *unexpected* labels in conflict with children's prior beliefs. Preliminary tests revealed no effect of participants' gender, birth order, and number of siblings on children's endorsement behavior, so the following tests collapsed across these factors. There was, however, a significant effect of standardized household size (computed within each culture), which was included as a covariate in the omnibus analysis.

A mixed model ANOVA with a dependent measure of endorsement (proportion out of four trials), a within-subject factor of social context (teacher presence vs.

absence) and between-subjects factors of condition (Ambiguous vs. Non-ambiguous), age (kindergarten vs. second grade), and cultural context (United States vs. Hong Kong) was performed.

A main effect was found for condition, $F(1, 114) = 137.22, p < .001, \eta_p^2 = .55$, replicating the finding in Study One. As with preschoolers, kindergartners and second-graders, on average, endorsed more unexpected labels for ambiguous items than for non-ambiguous items (Figure 3.1). Interestingly, this effect of condition was stronger in the older children, suggesting an improved ability for children above preschool age to show differentiated trust based on the strength of their prior beliefs. A main effect of age also revealed that second graders endorsed unexpected labels less frequently overall than did kindergartners, $F(1, 114) = 27.18, p < .001, \eta_p^2 = .19$. Finally, a main effect of cultural context, $F(1, 114) = 11.27, p < .01, \eta_p^2 = .09$, showed that children in the US endorsed unexpected labels *more* frequently overall than did children in Hong Kong. Nonetheless, these effects were qualified by an interaction between condition and age, $F(1, 114) = 6.01, p < .05, \eta_p^2 = .05$, and a three-way interaction between condition, age, and location, $F(1, 114) = 7.68, p < .01, \eta_p^2 = .06$. For social context, an effect of teacher presence was found, $F(1, 114) = 14.52, p < .001, \eta_p^2 = .11$, which was qualified by an interaction between social context and condition type, $F(1, 114) = 4.08, p < .05, \eta_p^2 = .04$, revealing greater compliance with unexpected labels in the presence of the teacher, particularly for non-ambiguous items.

Children's Endorsement of Unexpected Labels in the Teacher's Presence

The omnibus analysis paints a broad developmental picture of second-graders being more flexible than kindergartners at adapting their level of trust in unexpected testimony in relation to their prior beliefs. At the same time, the three-way interaction suggested that the cultural contexts in which learners were socialized may influence the *timing* of development in specific conditions. To clarify these potentially complex patterns, follow-up analyses were performed on children's endorsement patterns in the teacher's presence. The first set of analyses examined the effects of condition and age within each cultural context. The second set of analyses examined the effects of cultural context and age within each condition. The patterns of endorsement in the teacher's absence are discussed in a later section.

Children's Endorsement: Effects of Condition and Age within each Cultural Context

United States. When items were ambiguous, both kindergartners and second-graders in the US endorsed the teacher's labels more often than expected by chance, with $t(15) = 9.49, p < .001$ and $t(15) = 4.87, p < .001$ respectively. Planned comparisons revealed no effect of age on US children's levels of endorsement of labels for ambiguous items. In contrast, when items were non-ambiguous, an effect of age was found on US children's levels of endorsement, $F(1, 30) = 30.51, p < .001, \eta_p^2 = .51$. In the US, kindergartners were more likely than second-graders to endorse the teacher's labels for non-ambiguous items (Figures 3.2 and 3.3). Closer examination revealed that kindergartners endorsed labels more often than expected by chance, $t(15) = 2.15, p < .05$, whereas second-graders endorsed the unexpected labels at below chance levels, t

(15) = -7.68, $p < .001$. To examine individual responses, children were grouped by the number of trials (0 to 2 vs. 3 to 4) on which they endorsed unexpected labels. Similar results were obtained, with endorsement patterns between kindergartners and second-graders *not* differing in the Ambiguous condition, $\chi^2(1, N = 32) = 2.13$, *ns*, but differing in the Non-ambiguous condition, $\chi^2(1, N = 32) = 16.76$, $p < .001$, in which 11 kindergartners but none of the second-graders endorsed the unexpected labels on 3 or more trials (Table 3.1).

Hong Kong. When items were ambiguous, kindergartners endorsed the teacher's labels more often than expected by chance, with $t(15) = 4.87$, $p < .001$, whereas second-graders did so marginally more often than expected by chance, $t(15) = 1.99$, $p = .066$. Nonetheless, planned comparisons revealed no significant effect of age on Hong Kong's children's endorsement of unexpected labels, $F(1, 30) = 2.75$, *ns*. When items were non-ambiguous, both kindergartners and second-graders endorsed labels at below chance levels, with $t(15) = -3.05$, $p < .01$, and $t(15) = -6.06$, $p < .001$, respectively (Figures 3.4 and 3.5). Planned comparisons revealed a marginal effect of age on Hong Kong children's levels of endorsement for non-ambiguous items, $F(1, 30) = 3.18$, $p = .085$, $\eta_p^2 = .10$. An examination of individual responses revealed that endorsement patterns were different across ages in the Ambiguous condition, $\chi^2(1, N = 32) = 3.87$, $p < .05$, in which 14 kindergartners and 9 second-graders endorsed the unexpected labels on 3 or more trials (Table 3.1). Conversely, endorsement patterns were not different in the Non-ambiguous condition, $\chi^2(1, N = 32) = 1.14$, *ns*.

Children's Endorsement: Effects of Cultural Context and Age within each Condition

Ambiguous condition. There was no significant effect of cultural context, overall or within age groups. At all ages, both US and Hong Kong children endorsed the teacher's labels for ambiguous items to a similar extent, revealing a general willingness to trust in unexpected testimony when the strength of prior beliefs was weak. Examination at the level of individual responses (endorsement on 0 to 2 trials vs. 3 to 4 trials) yielded a similar picture of uniformly high levels of endorsement across ages and cultures in the Ambiguous condition.

Non-ambiguous condition. An effect of cultural context was found specifically for the kindergartners but not for the second-graders. US kindergartners were more likely than their Hong Kong peers to endorse the teacher's labels, $F(1, 30) = 12.61, p < .01, \eta_p^2 = .30$. In contrast, by second grade, both US and Hong Kong children endorsed few of the teacher's labels, and thus did not result in an effect of cultural context. Examination at the level of individual responses (endorsement on 0 to 2 trials vs. 3 to 4 trials) yielded a similar picture, namely, US and Hong Kong kindergartners differed in their levels of endorsement in the Non-ambiguous condition, $\chi^2(1, N = 32) = 8.13, p < .01$, with 11 kindergartners in the US but only three kindergartners in Hong Kong endorsing unexpected labels on 3 or more trials. Conversely, endorsement patterns were not different for second-graders, $\chi^2(1, N = 32) = 1.03, ns$.

Children's Reaction Times

United States. The average time that US children took to categorize the second standard items (baseline RT) was compared to that for the target items (target RT). A mixed model ANOVA with a dependent measure of RT, a within-subject factor of trial type (baseline vs. target), and a between-subjects factor of condition (Control vs. Ambiguous vs. Non-ambiguous) was performed, revealing an interaction of RT and condition, $F(2, 156) = 3.65, p < .05, \eta_p^2 = .05$. This suggested that whether or not children took longer to categorize target items than baseline items depended on the condition. Planned comparisons of target vs. baseline RT showed that the interesting pattern found with preschoolers was replicated with both kindergartners and second-graders in the US. As shown in Figure 3.6, it was only when an unexpected label was provided for *non*-ambiguous items that children in the US took a significantly longer time to categorize target items (kindergarten: $M = 1569\text{ ms}, SD = 1803\text{ ms}$; second grade: $M = 1443\text{ ms}, SD = 1018\text{ ms}$) compared to baseline items (kindergarten: $M = 773\text{ ms}, SD = 265\text{ ms}$; second-grade: $M = 670\text{ ms}, SD = 251\text{ ms}$), with $F(1, 36) = 5.26, p < .05, \eta_p^2 = .13$ and $F(1, 37) = 19.06, p < .001, \eta_p^2 = .34$ respectively. No differences in RT were found in the Control condition and the Ambiguous condition. As with the preschoolers, the older children could have been non-committal about their prior beliefs to the extent that the teacher's labels, though unexpected, were readily endorsed.

Hong Kong. In contrast, this pattern was not replicated in the Hong Kong children, who showed another pattern that was also consistent across developmental

stages. As shown in Figure 3.7, and confirmed by planned comparisons, both kindergartners and second-graders took significantly longer to categorize target items than baseline items in the Ambiguous condition (kindergartners: baseline $M = 670$ ms, $SD = 234$ ms; target $M = 1266$ ms, $SD = 1173$ ms; second-graders: baseline $M = 603$ ms, $SD = 169$ ms; target $M = 1200$ ms, $SD = 892$ ms), with $F(1, 37) = 5.51, p < .05, \eta_p^2 = .13$ and $F(1, 37) = 5.94, p < .05, \eta_p^2 = .14$ respectively, and in the Non-ambiguous condition (kindergartners: baseline $M = 727$ ms, $SD = 286$ ms; target $M = 1406$ ms, $SD = 1239$ ms; second-graders: baseline $M = 683$ ms, $SD = 239$ ms; target $M = 1190$ ms, $SD = 1232$ ms), with $F(1, 37) = 7.14, p < .05, \eta_p^2 = .16$ and $F(1, 37) = 4.27, p < .05, \eta_p^2 = .10$ respectively.

Thus, when both non-ambiguous items *and* ambiguous items were labeled in unexpected ways, children in Hong Kong needed more time to come to a categorization decision. The distinct yet consistent pattern found in each cultural context was intriguing, particularly in light of the finding that children in both the US and Hong Kong had shown identical surface behaviors in the Ambiguous condition, endorsing the unexpected labels for ambiguous items more frequently than expected by chance.

Children's Spontaneous Comments

As in Study One, spontaneous comments were transcribed and coded with a final sample of substantive comments that excluded comments that were off-task or irrelevant to the pictures in the game (e.g., "click, click"), direct answers (e.g., "With the jacket."), rule reiteration (e.g., "a button, goes with the jacket"), fillers (e.g., "Um..."), and ignorance cues (e.g., "I don't know").

Frequency of Spontaneous Comments. First, the total frequency of spontaneous comments was compared across conditions. For the US sample, out of the 85 comments observed across the participants, 56 were produced in the Non-Ambiguous condition, 25 were produced in the Ambiguous condition, and four were produced in the Control condition. This replicated the finding in Study One and showed that older children used different amounts of verbal communication to reconcile unexpected testimony with their prior beliefs of varying strengths. When incoming testimony aligned with prior beliefs, most children did not say anything in the teacher's presence. But when incoming testimony was discrepant with prior beliefs, more communicative attempts were made. Also, the stronger the children's prior beliefs, the more comments they were likely to make.

Despite an overall lower frequency of spontaneous comments produced by Hong Kong children (53, compared to 85 in the US), US and Hong Kong children did not differ in the way their comments were distributed across the three conditions, $\chi^2(2, N = 138) = 1.21, ns$. Of the 53 comments observed across the Hong Kong children, 33 were produced in the Non-Ambiguous condition, 19 were produced in the Ambiguous condition, and one was produced in the Control condition. Thus, based on the overall number of comments produced, Hong Kong children appeared to be more reticent than the US children, but demonstrated a similar pattern of adjusting their verbal communications in relation to the strength of their prior beliefs.

Types of Spontaneous Comments. Because children's spontaneous comments may have also varied in their communicative content, the comments were coded into three categories that differed by level of intensity. Level One comments showed surprise (e.g., "What?") or acceptance of the unexpected label with a comment for rationalization (e.g., "That's a little table!"), and were the lowest in intensity. Children using Level One comments acknowledged the unexpected nature of the labels in relation to their prior beliefs, but did not directly question or oppose the label. These comments typically function to elicit a *confirmation* of the unexpected testimony. Level Two comments conveyed conceptual doubt about the teacher's label, and were moderate in intensity. Conceptual doubt was expressed in several ways, including object-focused questions (e.g., "That's a wheel?"), teacher-focused questions (e.g., "Are you sure?"), inner speech that alternated between choices (e.g., "To the hair, hmm, to the teeth..."), and statements of uncertainty (e.g., "That looks like a button"). Children using Level Two comments acknowledged the unexpected nature of the labels, but further expressed a kind of cognitive dissonance that they experienced regarding the label, the informant, or their prior beliefs. These comments typically function to elicit an *explanation* of the unexpected label. Level Three comments were the highest in intensity, and either asserted the correct label ("Those are actually socks") or refuted the unexpected label ("Those are not mittens"). Children using Level Three comments directly refuted the unexpected label, or asserted their prior beliefs to the informant. These comments typically function to elicit either an *explanation* of the label, or a *cognitive change* on the part of the original informant. Each of the comments was coded

independently by two bilingual coders into one of the three levels. The percentage agreement reached 95% ($\kappa = .91$), with disagreements resolved through discussion.

Chi-squared tests performed on the whole sample revealed that as in the case of frequency, the intensity of spontaneous comments varied across conditions, both when the Control condition was included, $\chi^2(6, N = 160) = 28.33, p < .001$, and when considering only the Ambiguous vs. Non-ambiguous conditions, $\chi^2(3, N = 128) = 15.78, p < .01$. Data suggested that overall, when children encountered unexpected testimony, and particularly when their prior beliefs were strong, they were likely to make spontaneous comments that were higher in intensity. The question was, how did young learners in the US and Hong Kong compare at the level of their spontaneous comments?

A closer examination taking into account cultural context, age, and condition revealed that across cultures, children were more similar than they were different. The data did not show striking contrasts portraying children in the US as strikingly more expressive learners, nor children in Hong Kong as strikingly more reticent learners. Specifically, Figure 3.8 shows the number of kindergartners and second-graders in the two cultures who made spontaneous comments in response to unexpected labels in the Ambiguous and Non-ambiguous conditions. Several similarities were observed. In both cultures, fewer kindergartners than second-graders made comments overall in the Ambiguous condition, but more kindergartners than second-graders made comments overall in the Non-ambiguous condition. In both cultures, more children made Level

Three comments in the Non-ambiguous condition (US $n = 13$; Hong Kong $n = 11$) compared to the Ambiguous condition (US $n = 5$; Hong Kong $n = 3$).

At the same time, two cultural differences are worth noting. First, recall that Hong Kong kindergartners were less likely than their US peers to endorse unexpected labels for *non*-ambiguous items, with kindergartners in the US showing surprisingly high and above chance endorsement of the labels. Similarly, although the total number of children who made comments in the Non-ambiguous condition was similar across cultures (10 in the US and 8 in Hong Kong), the nature of those comments were different. Specifically, the comments made by US kindergartners were equally distributed between Level 2 comments conveying conceptual doubt ($n = 5$) and Level 3 comments asserting prior beliefs via refutation or corrections ($n = 5$). At the same time, all of the comments made by Hong Kong kindergartners were Level 3 comments ($n = 8$). Hence, although children across cultures were almost equally likely to say something, US kindergartners were likely to verbally express their uncertainty through thinking aloud or engaging the teacher with their question, whereas all Hong Kong kindergartners who chose to make a comment used it to refute or correct the unexpected label. Their eventual categorization judgments made more sense in light of these patterns.

The second difference was observed in the spontaneous comments made by second-graders in the Non-ambiguous condition. Recall that US and Hong Kong children at this age performed almost identically, such that they rarely endorsed the teacher's unexpected labels. However, more second-graders made comments in the US than in

Hong Kong. Specifically, whereas eight US second-graders refuted or corrected the teacher's label, only three Hong Kong second-graders did so. Therefore, despite comparable surface behavior in terms of their trust in unexpected testimony, the data suggest that children might be diverging in how they presented themselves as learners in the presence of a teacher, in ways that are normative in their respective cultures.

Endorsement of Unexpected Labels in the Teacher's Absence

As stated earlier, a mixed model ANOVA yielded a main effect of social context (teacher presence), $F(1, 114) = 14.52, p < .001, \eta_p^2 = .11$, that was qualified by an interaction between social context and condition, $F(1, 114) = 4.08, p < .05, \eta_p^2 = .04$. Planned comparisons showed that children tended to revert to their prior beliefs more frequently when categorizing non-ambiguous items in the teacher's absence when a pedagogical stance was induced. Specifically, once the teacher left the scene, kindergartners reverted to their prior beliefs on a significant proportion of trials in the Non-ambiguous condition, in both the US, $F(1, 119) = 11.87, p < .01, \eta_p^2 = .09$, and in Hong Kong, $F(1, 119) = 6.62, p < .05, \eta_p^2 = .05$, suggesting that kindergartners' endorsement of the teacher's unexpected labels for non-ambiguous items could have been, in part, due to social compliance. Nevertheless, it should be noted that even in the teacher's absence, US kindergartners still endorsed the teacher's labels on average 58% of the time, compared to kindergartners in Hong Kong who continued to endorse labels at below chance levels (19%). Given the non-ambiguous nature of the items, US kindergartners' level of endorsement was surprisingly high, and, in fact, closely

resembled the pattern found with preschoolers (whose endorsement of the teacher's labels was at 55% in her absence).

Discussion

Study Two looked at US and Hong Kong children's trust in unexpected testimony presented by an unfamiliar teacher. First and most importantly, in terms of the basic cognitive phenomenon, children in both ages and cultures endorsed unexpected labels for items that were ambiguous more frequently than for items that were non-ambiguous. In other words, at ages older than four, the strength of prior beliefs continues to play a role in children's trust in unexpected testimony. Second, in terms of developmental trends, older children appeared to be better able to differentiate their responses based on the strength of their prior beliefs. Whereas second-graders were just as likely as kindergartners to endorse unexpected labels for ambiguous items (for which prior beliefs may be weak), second-graders rarely endorsed unexpected labels for non-ambiguous items (for which they held strong prior beliefs). Third, in terms of the social context, the presence of a teacher made a difference in *kindergartners'* endorsement of labels for non-ambiguous items, as shown by their reversion to their prior beliefs, on average 12% of the time.

Finally, in terms of cultural contexts, a comparison of children in the US and Hong Kong revealed key differences in *kindergartners'* performance, specifically in the Non-ambiguous condition. Whereas Hong Kong kindergartners showed endorsement patterns similar to the second graders, endorsing unexpected labels at above chance

levels for ambiguous items, and at below chance levels for non-ambiguous items, in contrast, US kindergartners, but not second-graders, showed endorsement patterns that closely resembled the patterns shown by US preschoolers in Study 1. Specifically, although their levels of endorsement still varied depending on the condition, kindergartners in the US showed a surprisingly high degree of trust in unexpected labels even for non-ambiguous items.

Furthermore, examination of children's spontaneous comments suggested that when children heard the unexpected labels for non-ambiguous items, around half of the US children who made comments expressed a sense of conceptual doubt (e.g., "It looks like a button" or "Is that a wheel?"), whereas all of the Hong Kong children who made comments did so to refute or correct the label (e.g., "This is not a hairbrush" or "These should be socks"). Thus, it is conceivable that at kindergarten age, unexpected labels from a teacher (albeit an unfamiliar one) led US children to consider alternative possibilities about even the things for which their prior beliefs had been strong, but did not have the same effect for Hong Kong children, who clung to what they believed to be the correct answer. At the kindergarten level, considering children's categorization behavior and their spontaneous comments together supports the portrayal of US kindergartners as more dependent on the teacher but perhaps also more flexible in how they view the world, and Chinese learners as more autonomous at least in academic-related tasks but, in their effort to avoid mistakes, perhaps less flexible in how they view the world. Whether the level of trust demonstrated by US kindergartners is adaptive or maladaptive may depend on the specific nature of the learning that is taking place. In

light of the non-ambiguous items used in this study, this level of trust may not be ideal. However, considering the young ages of the kindergartners and the frequent likelihood for them to be told things that come in conflict with their prior beliefs, the ability to abandon an existing version of knowledge for radically new ideas presented by a trusted adult could be adaptive for learning.

Interestingly, although second-graders in the US and Hong Kong did not differ in their endorsement of labels for non-ambiguous items (both endorsing at low levels), more children in the US ($n = 8$) than in Hong Kong ($n = 3$) were found to refute or correct the teacher's unexpected labels using spontaneous comments. Also, looking at the Hong Kong sample only, *fewer* second-graders refuted or corrected the teacher's labels compared to kindergartners ($n = 8$). Therefore, by second grade, children from these two different cultures might be diverging in how they presented themselves in the presence of a teacher, in ways that reflected their socialization into independent vs. interdependent learners.

In summary, results in Study 2 suggest that children's trust in other people's testimony is universal in several aspects but might be further shaped by the ways in which children are socialized as learners in the cultural context. However, thus far, not much is known about the sample of children who produced these results, apart from the fact that they attended schools in the US or in Hong Kong. Furthermore, not much is known about the specific contexts in which these children were socialized. Study 3

provided a way to address this gap, by examining the trust-relevant perceptions and attitudes embraced by Study 2 participants, as well as their caregivers.

Chapter IV

Study 3: Examining the Ecological Context of Children's Trust

Studies 1 and 2 revealed interesting developmental and cross-cultural patterns in the ways in which young children endorsed unexpected testimony from a teacher. At the same time, it is important to remember that the experimental task itself was situated within a broader ecological system. Whether a child decided to endorse or reject unexpected labels from an unfamiliar teacher at school may have been shaped by contextual forces at multiple levels, including the child's normative experiences with his or her own teachers at school (microsystem level), his or her caregivers' attitudes and expectations about teachers and learners (mesosystem level), and the ways in which teaching and learning are perceived in the cultural context (macrosystem level). To begin describing the dynamics of this ecology of epistemic trust, and to provide a richer portrayal of the socio-cognitive assumptions that children brought to the task, Study 3 examined learning- and teaching-related perceptions and attitudes embraced by the Study 2 participants as well as their parents.

Perceptions of Teacher Transgressions

First, consider the nature of the testimony scenario presented in Studies 1 and 2: the teacher does something unexpected, namely, she provides a label that runs counter

to children's prior belief. How might children perceive unexpected speech or actions from a teacher? What might they believe to be the appropriate response to such behavior? In Study 3, the same group of children who participated in Study 2 were presented with hypothetical vignettes of a teacher who breached normative expectations in five kinds of situations: conventional (wearing a scarf on her waist), object labeling (calling a cup a hat), procedural (reading the time wrong), rule-based (feeding ducks when a sign says not to), and moral (ignoring an old man who fell when crossing a road). Children were invited to assess and explain the teacher's behavior, and to discuss whether it was appropriate for a child protagonist to say that the teacher was wrong. These responses provided insight into the kinds of concerns that children might have when confronting behavior or information that ran counter to their expectations or prior beliefs.

A rich tradition of research on young children's developing concepts about the social domain has indicated that through their preschool years, children increasingly distinguish between issues of morality (concerning people's basic welfare and rights) and social convention (concerning more arbitrary agreed-on uniformities) (Nucci & Nucci, 1982; Smetana, 1984; Smetana, Schlagman, & Adams, 1993). This pattern has been found in children's differentiated responses to breaches of moral and social conventional rules that they encounter in real life (e.g., schools, community playgrounds) as well as those that they encounter in hypothetical stories. Although this pattern has also been found both in the US and in Hong Kong, there are interesting differences. Hong Kong preschoolers have been to articulate more complex moral

reasoning than their US peers (Yau & Smetana, 2003). Also, although children in both cultures judged social conventional transgressions to be more permissible than moral transgressions, the difference appeared smaller for children growing up in Hong Kong than for children growing up in the US (Smetana, 1981; Yau & Smetana, 2003). These observations align with the emphasis on training and shaming that is often associated with Chinese parenting, in particular the imposing of rules and frequent feedback to guide their children to meet social obligations for proper behavior (Chao, 1994; Wu et al., 2002). In the present study, kindergartners, second-graders, and their caregivers were asked to evaluate a hypothetical teacher's surprising behaviors, and to explain why it was appropriate (or inappropriate) to confront the teacher about being wrong.

Based on the existing literature, children and caregivers were predicted to show different responses to different kinds of transgressions, such that breaching moral and legal rules would be judged and punished more severely than breaching accepted norms in procedures, labeling, and everyday conventions. Furthermore, US children were predicted to show a larger divide than Hong Kong children, who were likely to place tighter sanctions on the breaching of accepted norms, as a result of their socialization experiences. The relevance for the categorization task in Studies 1 and 2 is that a teacher's unexpected object labels would presumably resemble a breach of accepted norms as opposed to moral and legal rules. Therefore, responses of children and caregivers to those particular vignettes were examined in relation to their behavior in the computer task to explore potential relationships.

Parenting Attitudes and Styles

Next, recall that the mesosystem specifies the linkages and processes taking place between different contexts relevant to the developing person (Bronfenbrenner, 1993). Likewise, the way in which children respond to a teacher's unexpected testimony at their schools might relate to the way in which they are socialized in their homes. For example, children growing up in environments that punish disobedience may be more likely to defer to the labels of the teacher in the computer task. Still, this is an empirical question that invites additional data on the beliefs embraced by the parents of children in our specific sample. To obtain this data, a questionnaire was administered to also examine trust-relevant perceptions and attitudes held by these parents.

The questionnaire consisted of two sections. The first section presented the same hypothetical vignettes that children saw, as described above. For these vignettes, parents were asked to assess the teacher's behavior, to decide whether or not they wanted their children to say that the teacher was wrong, and to estimate the proportion of parents in the same cultural context who shared their perspective. Parents' responses were compared across cultural groups and also with those of their children to explore the consistency of attitudes within families. The second section presented items from four Likert-type scales, identified from the literature, which tapped into parents' attitudes and practices in socializing their children. Each scale was chosen for its relevance to the manner in which children might present themselves during the computer task.

The *authoritative parenting style* and *training* scales come from the Chinese Child Rearing Beliefs Questionnaire (CCRBQ) (Lieber, Fung, & Leung, 2006), which was developed to identify and measure parenting constructs meaningful in Chinese societies. The 8-item *authoritative parenting style* scale examines the extent to which parents endorse a child-centered focus on encouraging a child's expression of ideas and feelings (e.g., "Children's expression of emotions must be encouraged and assisted"), and the fostering of an egalitarian parent-child relationship (e.g., "I treat my child like an equal"). Recent studies revealed that parents in both Western and Chinese societies embraced authoritative parenting ideals (Pearson & Rao, 2003). However, the goals of authoritative parenting may differ across cultures, with Western parents focused on fostering their children's psychosocial competence as a developing human being, and with Chinese parents appealing to Western ideologies for ways to nurture creativity and confidence in their children so that they may be more competitive at school.

The *training* scale items describe a focus on monitoring and correcting children's behavior (e.g., "When a young child misbehaves in public, parents should correct him or her immediately even in front of other people"). The nine scale items together capture a style of parenting that, on surface reading, might resemble an authoritarian parenting style often associated with negative outcomes in Western societies, but is in fact normative, well-meaning, and predictive of positive outcomes in Chinese societies. Training has been found to correlate positively with authoritative style in Chinese parents but not in Western parents (Lieber, Fung, & Leung, 2006; Pearson & Rao, 2003).

The 9-item *filial piety* scale comes from the Socialization Goals Questionnaire, and measured parents' expectations for children to excel in their behavior and achievement to bring honor to their elders and their families (e.g., "It is important for my child to behave well for the sake of our family's reputation"). Like training, filial piety has been reported to correlate positively with authoritative parenting only in Chinese parents but not in Western parents (Pearson & Rao, 2003). At the same time, in both cultures, parents who emphasized training in their practices were also likely to place importance on filial piety.

The 4-item *encouragement of modesty* scale comes from the Parenting Practices Emphasized in China Questionnaire (Wu, et al., 2002), which measured cultural notions indigenous in China that were also found to be measurable in the US. Items concern the extent to which parents monitor the way children present themselves to others (e.g., "I discourage my child from appearing confident to others about his or her own abilities"). It was found to function as a separate dimension not correlated with either authoritative or authoritarian parenting in China, but did correlate negatively with aspects of authoritative parenting and positively with aspects of authoritarian parenting in the US.

Relationship with Trust in Testimony

In addition to examining the similarities and differences on these dimensions of socialization between US and Hong Kong parents, this study also explored potential links between parenting styles or attitudes and their children's behavior in the trust in

testimony context. For example, one might expect children whose parents endorse authoritative styles to be more likely to speak up in response to unexpected testimony. Conversely, children whose parents emphasize a need for modesty might appear more deferent to unexpected testimony in a teacher's presence. Finally, the culture may itself moderate the nature of these relationships, such that specific relationships between constructs may be present in some cultural contexts but not others.

Method

Participants

Participants were the 160 children in the US and Hong Kong who took part in Study 2, as well as their parents. The children engaged in a picture book activity with the primary experimenter in a 10-minute session at their own schools, one to three days before taking part in the computer task in Study 2.

Children's parents were invited to complete a questionnaire via pen-and-paper or through the internet. In terms of ethnicity, 96% of the parents in the US identified themselves as Caucasian (as well as two who identified as African American and one Hispanic), and 100% of the parents in Hong Kong identified as ethnic Chinese. Self-reported data on house size were collected as an estimate of socioeconomic status. The average house size for the US participants was 2,391 square feet, and the average house size for the Hong Kong participants was 524 square feet; both were comparable to local averages based on census data (US Census Bureau, 2009) or governmental report (Hong Kong Housing Authority, 2010). The average number of people living in the same

household for the US and Hong Kong samples were 4.4 and 4.3 respectively, exceeding the average household sizes reported in census figures to a comparable degree.

Materials and Procedure

To begin addressing the dynamics of the ecological system surrounding trust in testimony, as well as to provide a richer portrayal of the socio-cognitive assumptions that children bring to the task, the following measures were included to tap into children's and their caregivers' attitudes and practices related to teaching and learning.

Child perceptions of teacher transgression. In a 10-minute session occurring between one to three days prior to the computer task, children engaged in a picture book activity with the primary experimenter. Children were introduced to a story protagonist (matched with each child on age and gender) who was going to see his or her teacher in different places doing different things. To help children take on the perspective of the story protagonist, a photograph of a little girl or boy was used and made to stand on the table at the edge of the picture book "looking" at the teacher's actions. There were five stories each concerning a specific type of transgression: conventional (wearing a scarf on her waist), labeling (calling a cup a hat), procedural (reading the time wrong), rule-based (feeding ducks when a sign says not to), and moral (ignoring an old man who fell when crossing a road). Each story consisted of a scenario picture followed by an outcome picture (Appendix C). The experimenter structured the conversation about each story based on a fixed sequence of statements and questions. The experimenter began by introducing the scenario (e.g., "One day, Ava's teacher

received a gift. Look, it's a scarf!" and probing the child's socio-normative expectations (e.g., "Do you know how to put on a scarf? How do you put on a scarf?") Scripted feedback was provided to affirm or adjust children's expectations (e.g., "Yes/Actually, you put it around your neck.") Then, the experimenter turned the page to reveal what the teacher did (e.g., "Ava's teacher put the scarf around her waist."), and asked the following questions in fixed order:

- (1) Is Ava's teacher *right*, or is she *wrong*?
- (2) Should Ava say that the teacher is wrong, or should she say nothing? Why?
- (3) Why do you think Ava's teacher wore the scarf around her waist?

On the first question, if children replied to say that the teacher was right, they were asked to explain why they thought the teacher was right, before moving on to the next story. Findings showed that this was very rare, and occurred only seven times out of 800 total instances of the question. In other words, US and Hong Kong children judged the teacher's behavior as wrong across domains almost every time, and had the opportunity to respond to the second and third questions. To offset any bias from potential response sets, the order of choices (italicized) in questions 1 and 2 was counterbalanced across participants, but presented in the same order to each participant to preserve clarity.

Parental perceptions of teacher transgressions. The same hypothetical vignettes of teacher transgressions were presented to the parents in picture and word format in a questionnaire. The scenario and outcome pictures were shown side by side on a single page, along with captions that were identical to the verbal descriptions given

to the children. There were several differences in the version for parents. First, parents were not asked to judge whether the teacher's actions were right or wrong. Instead, parents' perceptions of the teacher's behavior were constrained to be wrong at the outset. Next, instead of judging whether the teacher was right or wrong, parents were asked to rate the severity of the depicted mistake from 0 (least severe) to 10 (most severe). Parents then indicated whether or not they would want their child to say that the teacher was wrong. Finally, they were asked to estimate out of 100 other parents in their own culture (e.g., "US parents"), the number of parents who would want the child to say that the teacher was wrong.

Parenting attitudes and styles. Thirty items from the four Likert-type scales were presented to parents in randomized order. These include the 8-item *authoritative parenting style* and 9-item *training* scales from the Chinese Child Rearing Beliefs Questionnaire (CCRBQ) (Lieber, et al., 2006), the 9-item *filial piety* scale from the Socialization Goals Questionnaire (Pearson & Rao, 2003) and the 4-item *encouragement of modesty* scale from the Parenting Practices Emphasized in China Questionnaire (Wu, et al., 2002). Parent expressed their agreement using a 6-point scale (1: strongly disagree, 2: disagree, 3: slightly disagree, 4: slightly agree, 5: agree, 6 : strongly agree), with the exception of *encouragement of modesty*, which utilized a 5-point scale tapping frequency of the behavior (1: never, 2: rarely, 3: sometimes, 4: often, 5: always). A list of questionnaire items is located in Appendix D. Finally, in the demographics portion of the questionnaire, parents also reported the average number of hours they spent with

children during the week, and nominated their favorite ways to spend time with their children.

Coding

What motivations and concerns underlie children's decision to confront a teacher about a mistake? Children's explanations were coded into two categories: *transgression focus* and *prosocial focus*. An explanation was coded as having a *transgression focus* if it revolved around the transgression only, such as by restating the teacher's behavior (e.g., "Because she called the cup a hat"), by appealing to socio-normative expectations (e.g., "Because a scarf is supposed to go around your neck"), or by mentioning the duty to let the teacher know (e.g., "It's not nice to not tell the teacher"). For children whose explanations fell into this category, the primary goal of telling the teacher about her mistake reflected a general assumption that transgressions should be closely monitored, pointed out, and rectified.

Alternatively, children's explanations were coded as having a *prosocial focus* (PF) when it described one or more specific projected outcomes of telling or not telling the teacher about the mistake, which could be at the physical level (e.g., "So he won't feed the ducks anymore"), the cognitive level (e.g., "So she can think the right thing"), or the social level (e.g., "Because other people will make fun of her and say that she's wearing it wrong"). For children whose explanations fell into this category, the primary goal of telling the teacher about her mistake reflected their concern regarding the consequences that the given transgression might have on the teacher, the protagonist,

or other individuals. Each of the explanations was coded into one of the two categories by two bilingual researchers. The percentage agreement based on a random sample of 25% of the explanations reached 97% ($\kappa = .93$), with the discrepancies resolved through discussion.

Results

Perceptions of Teacher Transgression

Children in the US and Hong Kong. As mentioned before, there was little variation in children's judgment of the teacher's behavior. On 99% of the trials, the teacher was judged to be wrong. The present analysis, therefore, focused on the two questions that were also presented to their parents. The first question concerned children's decisions about whether or not the story protagonist should tell the teacher about her mistake. The second question concerned children's reasons underlying their decision to tell or not tell the teacher about her mistake.

To tell or not to tell. Figure 4.1 shows the proportions of children who believed that a teacher should be confronted about her transgression in the US and in Hong Kong. Overall, children in the US agreed that the teacher should be told about her mistake on an average of 78% of the time, which was more likely than expected by chance, $t(77) = 7.60, p < .001$. A repeated measures ANOVA comparing across the five domains revealed that children's responses differed depending on the nature of the teacher's transgression, $F(4, 76) = 3.88, p < .01, \eta_p^2 = .17$. As suggested in the top panel in Figure 4.1, fewer US children responded that the teacher should be confronted about

her mistake in the labeling ($M = .68, SD = .47$) and convention ($M = .70, SD = .46$) domains, compared to the other three domains. Pairwise comparisons with Bonferroni adjustment showed that fewer US children thought the teacher needed to be confronted when her transgression was in the convention ($M = .69, SD = .47$) or labeling ($M = .67, SD = .47$) domains than when her transgressions concerned a societal ($M = .83, SD = .38$), or moral ($M = .85, SD = .36$) rule. Children's responses to a teacher's transgression in the procedural domain fell in between ($M = .79, SD = .41$).

Overall, Hong Kong children agreed that the teacher should be confronted about her mistake on an average of 95% of the time, which was more likely than expected by chance, $t(73) = 24.04, p < .001$, and significantly higher than the level shown by US children, $F(4, 70) = 16.77, p < .001$. A repeated measures ANOVA comparing across the five domains revealed that, unlike their US peers, children in Hong Kong did not differentiate their responses depending on the nature of the teacher's transgressions, $F(4, 70) = 1.09, ns$. Specifically, the proportion of children who thought that the teacher should be confronted about her mistakes was comparable across the labeling ($M = .91, SD = .29$), convention ($M = .94, SD = .25$), procedural ($M = .95, SD = .23$), societal rule ($M = .95, SD = .22$), and moral ($M = .96, SD = .19$) domains (Table 4.1).

A multivariate ANOVA was performed with the dependent variable of children's responses to the five transgression domains, and the independent variable of children's cultural context. An effect of cultural context was found, $F(5, 148) = 4.65, p < .01, \eta_p^2 = .14$. Pairwise comparisons with Bonferroni adjustment showed that the proportion of

children responding that a teacher should be confronted about her mistake differed across cultural contexts in all of the five domains: convention, $F(1, 152) = 18.61, p < .001$, labeling, $F(1, 152) = 17.43, p < .001$, procedure, $F(1, 152) = 8.54, p < .01$, societal rule, $F(1, 152) = 7.32, p < .01$, and moral, $F(1, 152) = 7.28, p < .01$. As expected, the contrasts between cultural contexts were the most pronounced in the convention and labeling domains. In other words, when a teacher breached socio-normative expectations in the way she wore a scarf (on her waist) or the way she labeled a cup (as a hat), fewer children in the US than in Hong Kong thought that she should be confronted about her behavior.

With respect to development, a multivariate ANOVA with a dependent variable of children's responses to the five transgression domains and an independent variable of age revealed no significant differences between kindergartners and second-graders, both overall and within each cultural context. Hence, in each culture, children's beliefs about whether a teacher should be confronted about her mistakes were consistent across kindergartners and second-graders. Interestingly, differences across age were found in children's *explanations* of why the teacher should or should not be told that she was wrong, suggesting that identical surface responses may have been motivated by different underlying processes.

Explanations for saying nothing. First, for each type of transgression, a minority of children believed that the story protagonist should say nothing in response to the teacher's transgression. Of the 400 total opportunities per culture, there were 84 and 17

respective instances for which US and Hong Kong children believed that Aidan or Ava should say nothing. When asked to explain their answers, children provided a variety of responses, as summarized in Table 4.2. The most frequent type of explanations focused on the teacher's emotions. Emotion-focused explanations were provided by children in the US only, which was interesting but not too surprising given the strong emphasis in the US on developing children's psychosocial competence and their ability to articulate the feelings of oneself and other people, as early as preschool (Tobin et al., 2008). The next most frequent reasons for saying nothing were in order to avoid punishment or to be polite, also provided mostly by the US children. Overall, it was unexpected to find so many children in the *US*, instead of in Hong Kong, believe that the teacher should not be told that she was wrong, and furthermore provide well-elaborated reasons that served the interest of not only the protagonist but also the teacher.

Explanations for pointing out a teacher's mistake. Nonetheless, the majority of children responded that the story protagonist *should* tell the teacher that she was wrong. Children's explanations served to reveal the aspects of the transgression scenario that most captured their attention. Was it important to say that the teacher was wrong due to a need to monitor and point out other people's mistakes? Or was it important to say that the teacher was wrong due to there being consequences at stake? Corresponding to these two alternatives, explanations were coded into one of two categories: transgression focus vs. prosocial focus. Sample explanations reflecting a transgression focus included "Because she's not wearing it the right way" and "Because the sign says no feeding". Sample explanations reflecting a prosocial focus included "So

that she helps the old man get up” and “So that no one laughs at the teacher”. Because the explanations were numerous in type and overall tokens, it was possible to examine them in relation to the specific domains of transgression.

After excluding 30 instances of “I don’t know” and eight explanations that were difficult to interpret, there were a total of 657 substantive explanations distributed across the five domains, which were further coded for their communicative foci as shown in Table 4.3. A series of chi-squared analyses were performed to investigate whether the types of explanations differed based on the children’s age and on the nature of the teacher’s transgression.

There was an overall effect of age, $X^2(1, N = 647) = 74.18, p < .001$, such that kindergartners were relatively biased toward a transgression focus (TF) in their explanations, whereas second-graders were relatively biased toward a prosocial focus (PF) in their explanations. A ratio of the number of TF explanations to the number of PF explanations was computed to describe the extent of children’s biases. A ratio close to one indicated that children’s explanations were distributed similarly among the two types of foci. The higher the ratio was, the more the explanations were biased toward a transgression focus. The closer the ratio was to zero, the more the explanations were biased toward a prosocial focus. For example, the ratio for kindergartners in the overall analysis was 3, compared to .72 for the second-graders. The shift in explanation focus was observed in all five domains of transgression, and thus the age effect was not limited to particular types of transgressions.

What was interesting was that whereas increased focus on transgressions by younger vs. older children was mirrored in both cultures, it was more pronounced in the children in Hong Kong, $X^2(1, N = 360) = 68.78, p < .001$, than their peers in the US, $X^2(1, N = 297) = 13.63, p < .001$. Closer examination revealed that, as children's endorsement patterns, the critical differences came, again, from the kindergartners. Whereas second-graders in the US and in Hong Kong provided a roughly equal number of transgression-focused and prosocial explanations, $X^2(1, N = 345) = 1.76, ns$, the kindergartners in both cultural contexts provided more transgression-focused than prosocial explanations, $X^2(1, N = 312) = 8.76, p < .01$. Furthermore, this bias toward a transgression focus was more strongly expressed by Hong Kong kindergartners than by US kindergartners (Table 4.3). Specifically, whereas the TF:PF ratio in the US kindergartners ranged from 1.4 (moral) to 2.6 (societal rule), the same ratio in their Hong Kong peers ranged from 1.8 (moral) to 10.0 (procedural). Therefore, children's perceptions of a teacher's transgression showed that, at least in a hypothetical situation, children in this Hong Kong sample were more likely than their US peers to monitor and point out a teacher's mistakes.

Regardless of cultural context, with age, children's justifications for telling the teacher about being wrong became more biased toward a prosocial focus. Overall, children appeared to progress from a preoccupation with the simple wrongness of behavior to reasoning about the nuances of the situation as well as broader implications of the teacher's mistake and of the protagonist's intervention.

Parents in the US and Hong Kong. Analyses focused on parents' responses to four questions that asked them to: 1) rate the severity of each transgression, 2) indicate whether they wanted their children to point out a teacher's mistake, and 3) estimate the number of parents from their own countries who would favor telling the teacher about her mistake.

Ratings of transgression severity. The first set of analyses focused on parental ratings of the five transgressions for their *severity*, using a scale of 0 to 10 (Table 4.4). The mean ratings of severity suggested that parents in both the US and Hong Kong perceived some types of transgressions to be more severe than others. Parents in both cultural contexts rated the breaching of a moral rule as the most severe (US $M = 9.18$, $SD = 1.82$; HK $M = 9.52$, $SD = 1.76$) and the breach of a conventional rule as the least severe (US $M = .76$, $SD = 1.67$; HK $M = 2.49$, $SD = 3.69$). Repeated measures analyses of variance showed that the type of transgression had an effect on parents' severity ratings in both the US, $F(4, 75) = 224.76$, $p < .001$, $\eta_p^2 = .92$, and Hong Kong, $F(4, 71) = 61.31$, $p < .001$, $\eta_p^2 = .78$. In addition, a multivariate ANOVA revealed an effect of cultural context on parents' severity ratings, such that US parents described each of the transgressions as less severe than did Hong Kong parents, $F(5, 148) = 14.15$, $p < .001$, $\eta_p^2 = .32$. Planned comparisons with Bonferroni corrections showed that parents in the US rated transgressions as less severe than did parents in Hong Kong in the domains of labeling, $F(1, 152) = 68.90$, $p < .001$, $\eta_p^2 = .31$, convention, $F(1, 152) = 14.35$, $p < .001$, $\eta_p^2 = .09$, procedure, $F(1, 152) = 19.43$, $p < .001$, $\eta_p^2 = .11$, and societal rules, $F(1, 152) = 7.51$, $p <$

.01, $\eta_p^2 = .05$, but not in the moral domain, which both groups of parents perceived as similarly high in severity.

To tell or not to tell. The next set of analyses focused on parents' decisions about whether or not their children should tell the teacher about her mistake. Figure 4.2 shows the proportion of parents who believed that their child should confront the teacher about her transgression in the US and in Hong Kong. Overall, parents in the US agreed that the teacher should be told about her mistake on average 69% of the time, which was more likely than expected by chance, $t(78) = 7.91, p < .001$. A repeated measures ANOVA comparing across the five domains revealed that parents' responses differed depending on the nature of the teacher's transgression, $F(4, 75) = 71.49, p < .001, \eta_p^2 = .79$. As suggested in the top panel in Figure 4.2, US parents' responses covered a wide range of the severity scale, with very few parents responding that the teacher should be confronted about her mistake in the convention domain ($M = .16, SD = .37$), and with many more parents responding that the teacher should be confronted in the labeling ($M = .65, SD = .48$) and moral domains ($M = .76, SD = .43$), and the vast majority of parents responding likewise in the societal rule ($M = .92, SD = .27$) and procedural ($M = .95, SD = .22$) domains.

Overall, Hong Kong parents agreed that the teacher should be confronted about her mistake on an average of 82% of the time, which was more likely than expected by chance, $t(75) = 14.53, p < .001$, and significantly higher than the level shown by US parents, $F(1, 153) = 16.02, p < .001$. A repeated measures ANOVA comparing across the

five domains revealed that, in contrast to the finding in their children, Hong Kong parents' responses differed depending on the nature of the teacher's transgression, $F(4, 72) = 15.97, p < .001, \eta_p^2 = .47$. As suggested in the bottom panel in Figure 4.2, Hong Kong parents' responses covered a moderate range of the severity scale, with relatively few parents responding that the teacher should be confronted about her mistake in the convention domain ($M = .47, SD = .50$), and many more parents responding likewise in the labeling domain ($M = .82, SD = .39$), and with the vast majority of parents responding likewise in the societal rule ($M = .92, SD = .27$), moral ($M = .92, SD = .27$), and procedural ($M = .96, SD = .20$), domains.

To examine differences across cultural contexts, pairwise comparisons with Bonferroni corrections were performed. Results showed that the proportion of parents responding that a teacher should be confronted about her mistake differed across cultural contexts in three of the five domains: convention, $F(1, 153) = 19.00, p < .001, \eta_p^2 = .11$, labeling, $F(1, 153) = 5.82, p < .05, \eta_p^2 = .04$, and moral, $F(1, 153) = 7.75, p < .01, \eta_p^2 = .05$. Parents responded similarly for the procedure, $F(1, 153) = .11, ns$, and societal rule, $F(1, 153) = .01, ns$, domains. In other words, when a teacher breached socio-normative expectations in the way she wore a scarf (on her waist), the way she labeled a cup (as a hat), and the way she did not help an old man who fell, fewer parents in the US than in Hong Kong thought that she should be confronted about her behavior. To examine differences across parental cohort, a multivariate ANOVA with the dependent variable of parents' responses to the five transgression domains and the independent variable of age was performed. No significant differences were found

between parents of kindergartners and parents of second-graders, both overall and within each cultural context. Thus, there was consistency within cultural contexts in how two cohorts of parents preferred their children to respond to a teacher's transgression.

Estimating other parents' responses. Parents were also asked to estimate the number of parents (out of 100) in their own countries (United States or Hong Kong) who would want their children to confront the teacher. These estimates revealed parents' implicit assumptions about how much they represented or were distanced from the socialization values that they perceived to be salient in their encompassing cultural context. Parents' estimates were compared to the actual proportion of sampled parents who wanted their children to point out a teacher's mistakes.

As shown in Table 4.5, US and Hong Kong parents generally underestimated other parents' likelihood to favor pointing out the mistakes in many domains. However, US parents also overestimated other parents' likelihood to point out a teacher's mistakes in convention domain (wearing a scarf). US parents' estimate did not differ from the actual proportion for the moral domain, and Hong Kong parents' estimate did not differ from the actual proportion for the convention domain. Interestingly, however, both sets of parents assumed that other parents would want their children to point out a moral transgression at higher rates than they would point out a rule transgression, yet they themselves actually showed the opposite direction.

Parenting Attitudes and Styles

Filial Piety. Table 4.6 presents US and Hong Kong parents' mean scores, standard deviations, and reliabilities on the four parenting scales. Parents across the two cultural contexts endorsed filial piety to a similar extent, suggesting that in the current sample, parents in both the US ($M = 4.49$, $\alpha = .73$) and Hong Kong ($M = 4.45$, $\alpha = .73$) expressed similarly moderate expectations for their children to be well-behaved and high achieving for the honor of the family. However, cultural differences were found for the other three dimensions. Specifically, parents in Hong Kong showed greater endorsement than parents in the US of scale items related to encouragement of modesty, training, authoritative parenting style. Moreover, an examination of the ranked importance of the four parenting dimensions within each culture showed general similarities, with the exception that Hong Kong parents gave higher rankings for the Training scale than the Filial Piety scale, whereas US parents showed the reverse pattern.

Modesty. In terms of parents' encouragement of modesty, US parents indicated that they rarely ($M = 2.06$, $\alpha = .23$) discouraged their children from appearing assertive and confident about their own views, whereas Hong Kong parents sometimes did ($M = 2.53$, $\alpha = .68$), $F(1, 155) = 27.79$, $p < .001$. The difference across cultures was found in both kindergartners' and second graders' parents. However, the reliability of this scale in the US was very low ($\alpha = .23$), suggesting that the items did not fall into a coherent construct for US parents. Note that despite showing higher endorsement than US parents on this dimension, Hong Kong parents were still rather low on the 5-point scale. Thus, there was no evidence suggesting that the parents in this sample, including those

in Hong Kong, were at all opposed to their children's assertion of their own ideas and abilities.

Training. In terms of parents' endorsement of training their children, mean scores on the 6-point scale showed that US parents slightly agreed ($M = 4.37, \alpha = .66$) with the importance of closely monitoring their children's behavior with respect to a given standard, whereas Hong Kong parents agreed ($M = 4.83, \alpha = .59$), $F(1, 155) = 29.28, p < .001$. The difference across cultures was found in both kindergartners' and second graders' parents. These patterns suggested that US parents were not in disagreement with promoting correct behavior of their children, but parents in Hong Kong may be more willing to endorse those corrective practices.

Authoritative Parenting Style. In terms of authoritative parenting style, parents in both cultural contexts agreed (US $M = 4.81, \alpha = .61$; HK $M = 4.97, \alpha = .66$) with the importance of encouraging their children to express their feelings and ideas, with Hong Kong parents showing stronger endorsement than US parents, $F(1, 155) = 5.96, p < .05$. Nonetheless, planned comparisons within age groups revealed that parents of kindergartners were the primary contributors to this cultural difference. When examining the mean scores of individual items, two items were found (in both the US and Hong Kong) to receive consistently lower endorsement than the others: "I treat my child like an equal" and "Parents need to provide reasons for their requests to children". Both items concerned the extent to which parents nurtured an egalitarian versus hierarchical relationship with their children. When the two items concerning relational

hierarchy were excluded, parents no longer differed across cultural contexts and showed a comparably high endorsement of authoritative parenting values (US $M = 5.22$, $\alpha = .69$; HK $M = 5.10$, $\alpha = .68$), $F(1, 156) = 3.03$, *ns*. The resultant 6-item scale showed higher reliability for both cultural groups; thus, this version of the scale was used in the ensuing correlation analyses. Overall, the data suggest that parents in the US and in Hong Kong were similarly in favor of nurturing warm and supportive relationships with their children and encouraging their children's expression of feelings and ideas. At the same time, parents in both cultural contexts believed it was still necessary to preserve some degree of hierarchy rather than nurturing a completely egalitarian relationship.

Exploring Connections to Children's Trust in Testimony

Results revealed group-level similarities and differences in the attitudes and perceptions endorsed by Study 2 participants and their parents. This section begins to explore the associations between these attitudes and perceptions and the ways in which children responded to unexpected testimony. The variables included for analysis were the four dimensions of parenting attitudes (filial piety, modesty, training, and authoritative parenting style excluding the two items concerning relational hierarchy), as well as three dimensions of transgression perception derived from children's and their parents' responses to the hypothetical scenarios (number of times out of the five stories which children and their parents favored telling the teacher about her mistake; average parental ratings of transgression severity). Also included in the analysis were three aspects of children's responses to unexpected testimony— the frequency of

endorsing the teacher's labels, as well as the number and intensity of their spontaneous comments.

Table 4.7 shows the bivariate correlations among the abovementioned variables, collapsed across conditions and cultural contexts. Overall, and when controlling for children's age (in months), two variables were found to correlate with children's endorsement of unexpected labels. First, parental ratings of transgression severity correlated negatively with endorsement, $r(124) = -.20, p < .05$. Thus, children whose parents rated a teacher's transgression as being more serious were also more likely to endorse a teacher's unexpected labels. Second, authoritative parenting values correlated positively with children's endorsement of unexpected labels, $r(124) = .22, p < .05$. Thus, children whose parents strongly agreed with authoritative parenting values were more likely to endorse a teacher's unexpected labels.

When the Ambiguous and Non-ambiguous conditions were examined individually, as shown in Table 4.8, correlations strengthened between severity ratings and endorsement, $r(56) = -.27, p < .05$, and between authoritative parenting and endorsement, $r(56) = .44, p < .01$. Interestingly, *both correlations were specific to the Non-ambiguous condition*, and were not observed in the Ambiguous condition. A preliminary look within cultures suggested that the association of authoritative parenting values might have arose from the US sample, $r(29) = .54, p < .01$, and perhaps not so much from the Hong Kong sample, $r(28) = .19, p > .2$. However, given the small sample sizes at this level of analysis (within a specific condition and cultural context, $N =$

32), this finding should be best treated with caution, but also curiosity as an invitation for future investigations. None of the other variables examined were found to correlate with aspects of children's response to unexpected testimony.

Discussion

Study 3 was conducted to enable a richer understanding of the cultural contexts and specific sample of individuals that gave rise to the Study 2 findings. To address these aims, Study 2 participants, as well as their parents, were invited to share their perceptions and attitudes about learning and teaching.

The first part of the study presented children and their parents with hypothetical scenarios about a teacher breaching socio-normative expectations in five different domains. In every domain, although the majority of children in both cultures favored telling the teacher that she was wrong, more children in Hong Kong did so than in the US. In fact, 20 per cent of US responses (compared to under five per cent in Hong Kong) were in favor of saying nothing to the teacher. US children's decisions were also more differentiated based on the nature of the transgression, compared to those of Hong Kong children. Specifically, US children were less likely to respond that a story protagonist should confront a teacher when she breached a conventional or labeling rule, compared to when she breached a procedural, societal, or moral rule. This pattern aligns with prior work examining children's responses to actual and hypothetical transgressions, which typically reported that children were more forgiving of conventional transgressions than moral transgressions (e.g., Smetana, 1981; Smetana,

Schalzman, & Adams, 1983) or responded differentially to convention vs. moral transgressions (Nucci, 1982). Hong Kong children, on the other hand, were likely to respond that the teacher should be confronted about her mistakes in all five domains. These culture-specific patterns in differentiation based on domain were observed at both ages, suggested that children in Hong Kong may be socialized to actively monitor behavior for accuracy in a wider range of domains. Comparisons of prior studies with US (Smetana, 1981) and Hong Kong (Yau & Smetana, 2003) also suggested that although children in both cultures perceived moral transgressions to be less permissible than conventional transgressions, the difference appeared smaller for children growing up in Hong Kong than their peers in the US.

Next, children's explanations for telling the teacher about her mistake were examined, producing two key results. First, children's reasons for confronting the teacher changed across development, from kindergartners who were predominantly concerned with the wrongness of the transgression to second-graders who were more likely to focus on the prosocial outcomes of telling the teacher. Second, among the kindergartners, children's bias toward a transgression focus was more pronounced in Hong Kong than in the US for four of the five domains. The greater focus on the transgression lends support to the idea that Hong Kong children may more actively monitor behavior for accuracy. Proportionately more kindergartners in Hong Kong than in the US favored telling the teacher that she was wrong, and primarily because she did something wrong. In contrast, when kindergartners in the US than in Hong Kong favored telling the teacher that she was wrong, they were relatively more likely to do so to bring

about a specific projected outcome (e.g., “So she knows it’s a cup not a hat”). Combined results suggested that young children in Hong Kong, and kindergartners in particular, were more likely than their US peers to perceive a wide range of socio-normative breaches as transgressions that should be monitored, pointed out, and rectified.

Parental ratings of the transgressions on severity aligned with their children’s patterns of responses. Specifically, the severity ratings of Hong Kong parents exceeded that of US parents for all types of transgressions except in the moral domain (which the two groups of parents perceived as equally severe). Moreover, resembling the child data, more Hong Kong parents than US parents favored telling the teacher that she was wrong. Nonetheless, parents in both cultural contexts differentiated their responses based on the nature of the transgression to a greater extent than did their children. Combined, these results suggest that children’s perceptions of a teacher’s transgressions, despite being more rigid and less differentiated, might be shaped in part by the beliefs salient in their family and cultural contexts.

The second part of the study asked parents to indicate their endorsement of various parenting attitudes and styles relevant to children’s trust in testimony. Findings suggested that, contrary to expectations, US and Hong Kong parents did not depart radically from each other in their endorsement of the four dimensions (authoritative parenting, encouragement of modesty, filial piety, and training) included in the questionnaire. On average, parents in both cultures rarely discouraged their children from asserting their own thoughts and abilities, and generally agreed on the need to

monitor children for correct behavior. Also, they agreed on the need to encourage children to express their feelings and ideas (which aligned with their low encouragement of modesty), and the importance of being well-behaved and high achieving in honor of the family. Although parents across cultures did not differ on the general valence of their responses, they differed somewhat in the extent of their endorsement. Specifically, Hong Kong parents were more likely than US parents to endorse encouragement of modesty and training values. Thus, on the one hand, common socialization goals were found across US and Hong Kong parents in terms of *what* they wanted to nurture in their children (to be able to express their ideas, to excel in their behavior and academic achievement). On the other hand, there were differences in how the US and Hong Kong parents socialized their children to reach those goals. Notably, Hong Kong parents endorsing Western ideals of authoritative parenting tended to also uphold traditionally Chinese practices of monitoring their children for correct behavior.

The third part of the study set out to explore, at the individual level, whether the perceptions and attitudes endorsed by children and their parents were associated with children's responses to a teacher's unexpected testimony. One of the findings related to parents' perceived severity of the hypothetical transgressions. Specifically, parents who rated hypothetical transgressions as more severe had children who less frequently endorsed unexpected labels from a teacher, in particular for non-ambiguous items. In other words, the more negatively parents responded to breaches of socio-normative expectations, the more likely their children were to avoid breaching labeling rules in the

categorization task. Interestingly, these patterns aligned with the predictions of regulatory focus theory (Higgins, 1987), which distinguishes between a focus on promotion (maximizing gains) versus a focus on prevention (avoiding losses) in one's behavior. Children's predominant focus can be shaped by their socialization experiences. For example, when children are frequently criticized for their poor performance and rewarded for their good performance by the withdrawal of such criticism, they tend to function with a focus on preventing negative outcomes (Molden & Miele, 2008). In the context of this study, parents' tendency to respond to transgressions more negatively may have resulted in their children being more vigilant in the face of the unexpected labels.

A rather unexpected finding worthy of following up concerned parents' agreement with authoritative parenting style. Specifically, when parents reported greater agreement with authoritative parenting approaches, their children were more likely to endorse unexpected labels from a teacher, particularly when the labels were for non-ambiguous items. To the extent that parent-reported values reflected their actual parenting behavior, this finding suggests that the more parents came across as warm, encouraging, and involved, the more frequently their children trusted in a teacher's unexpected testimony. Indeed, previous work reported that children's patterns of trust were influenced by the nature of their attachment styles (Corriveau et al., 2009). In this case, children whose parents embraced authoritative values may be socialized to feel more secure as learners in the guidance of their adult teachers, and this sense of security may have led children to consider the alternative reality presented by the

teacher as potentially true. Alternatively, the more the expression and respect of diverse opinions were encouraged in the family, the more readily the children considered unlikely alternatives as true. Future work is needed to disentangle these alternatives.

In sum, Study 3 revealed that whereas children and parents in the US and Hong Kong shared similarities in many of their perceptions of transgressions and attitudes about parenting, they differed in magnitude on multiple dimensions. Children in Hong Kong, compared to their US peers, were found to more closely monitor behavior for accuracy in a wider range of domains, with the differences more pronounced for the kindergartners. Accordingly, parents in Hong Kong, compared to parents in the US, tended to judge transgressions as more severe and more types of transgressions in need of being pointed out, and were more likely to agree with the need as parents to monitor children for correct behavior. Exploratory analyses of the connections between the perceptions and attitudes found in Study 3 and children's endorsement behavior in Study 2 revealed that parents who rated hypothetical transgressions as less severe and who were more authoritative in their socialization values had children who were more likely to trust in a teacher's unexpected testimony over their own prior beliefs even when they were strong. These associations, though preliminary, are intriguing and invite further investigation into how the various layers of the ecological context influence children's trust in other people for knowledge.

Chapter V

General Discussion

The current research was guided by two main objectives. The first objective was to examine the role of prior beliefs in children's trust in unexpected testimony. Given that the existing literature on children's trust in testimony has mostly focused on attributes of the informant, the current work aimed to renew attention to attributes of the learner, and to stimulate wider consideration of learning as a transactional process of cognitive reconciliation. The second objective was to examine trust in testimony in relation to its ecological context. Specifically, do children's responses to unexpected testimony differ depending on social, developmental, and cultural contexts? Drawing from observations of children's behavior across three age groups and two cultures, the current research reveals that the strength of children's prior beliefs plays a significant role in their endorsement of a teacher's unexpected testimony. As early as age four, endorsement of unexpected labels was highly likely when children held weak intuitions about the identity of the objects, and less likely when children's intuitions were strong. Across the age groups and cultures sampled, children adapted their levels of trust in relation to the strength of their prior beliefs. This robust pattern suggests that children as young as four may possess some metacognitive awareness of the quality of their

knowledge, and may use this awareness to guide their trust in other people's testimony. Furthermore, the ability to adapt the level of trust in relation to the strength of prior beliefs was observed to be more fine-tuned with age. In particular, second-graders, compared to the kindergartners, showed a larger difference in their levels of trust in labels for ambiguous vs. non-ambiguous items.

Inspired by classic theories that bring the contexts of children's development to the forefront (e.g., Bronfenbrenner, 1993; Rogoff, 1993; Vygotsky, 1978), the current research examined children's trust in testimony in relation to its ecological, social, and cultural contexts. One feature of the experimental design was that the unexpected testimony was not presented to the children as a planned component of the research session. Instead, a nearby "teacher" enlisted to sit with the children while the experimenter was away (to find a new recorder or to take a phone message) was the informant who provided the unexpected testimony. In other words, key manipulations were, to a degree, entrenched in children's everyday ecology of learning, and elicited children's existing assumptions about teachers and learners. Therefore, children's responses to the unexpected testimony serve as a good approximation to their responses in real-life learning scenarios. Comparing results coming from the current approach with results coming from laboratory research shows that children tend to perform with greater sophistication in *explicit* research situations, when both the informants and the testimony are presented systematically in person or via videos, and the act of trusting or not trusting an informant is very much in the foreground of the participants' experience. Whereas past laboratory research frequently found 4-year-olds

to reliably trust in an accurate informant, and 5-year-olds to reliably distrust testimony when appropriate, the current approach suggests more protracted development in real life settings. Specifically, when entrenched in their everyday learning environments as in the current study, 4-year-old preschoolers and 6-year-old kindergartners in the US overwhelmingly trusted in unexpected testimony even when their own prior beliefs were strong (in contrast to 8-year-old second-graders who overwhelmingly rejected the testimony in this situation). Nonetheless, concurrent analyses of children's spontaneous comments as well as their reaction times in the categorization task showed that the younger children were far from simply accepting a teacher's labels without any acknowledgement of the conflict. In fact, both preschoolers and kindergartners made more comments and took a longer time to make a judgment when incoming testimony was in clear conflict with their (strong) prior beliefs versus when incoming testimony was somewhat in conflict with their (weak) prior beliefs. The current research shows how children's competence observed in explicit research situations might translate into what they actually do in the ecology of everyday learning.

Social context was manipulated in the current research by having children make categorization decisions first in the presence of the teacher informant, and later in her absence when a pedagogical stance was induced. This manipulation, resembling the one used in Jaswal, Lima, and Small (2008), was designed to find out the extent of children's trust that was due to mere compliance with the social demands of the teacher, as opposed to a genuine consideration of the unexpected testimony as potentially true. In the teacher's absence, children performed the identical categorization task one more

time with their answers recorded in order to help teach younger children about different kinds of things. Findings showed that when a teacher provided unexpected labels for items for which they held strong prior beliefs, children reverted to their own beliefs around 10% of the time when teaching younger learners in the teacher's absence. The small but significant effect of social context poses methodological implications. Specifically, whenever children's trust is measured in terms of a behavioral response in response to a physically present informant, the possibility of social compliance should always be considered (see also Jaswal, 2010) in order to obtain a more accurate assessment of trust.

The investigation of children's trust in relation to their cultural context produced surprising results. Contrary to cross-cultural literature on Socratic vs. Confucian learners, which report Asian learners as being more reticent, respectful, and passive in the classroom than Western learners, the current research did not find Hong Kong kindergartners and second-graders to be more deferent than US children to the testimony that a teacher provided. Like their US peers, children in Hong Kong adapted their level of trust in relation to the strength of their prior beliefs. However, the pattern of overwhelming trust in unexpected labels for non-ambiguous items that was observed in the younger US children was found in *neither* kindergartners nor second-graders in Hong Kong. When their prior beliefs were strong, Hong Kong children at both ages endorsed unexpected labels at below chance levels, though only the second-graders showed a floor effect. In sum, the timing of children's development of trust vary across cultures, with Hong Kong children reflecting the strength of their prior beliefs in their

trust decisions at younger ages than US children (making it a pertinent next step to examine what preschoolers in Hong Kong might do in the identical task). Nonetheless, the present results suggest that if self-construal did play a role in kindergartners' and second-graders' trust in testimony, it did appear not exert its influence through the ways in which (independent Socratic vs. interdependent Confucian) learners were socialized to conduct and present themselves in the classroom context.

The question persists as to *how* these patterns came about. What other aspects of the cultural context might have contributed to the contrast in kindergartners' trust behavior between the US and Hong Kong?

One possibility concerned the different ways in which children in predominantly independent and predominantly interdependent cultures are socialized to regulate their academic performance. Converging lines of evidence suggest that Chinese children may have been more vigilant and concerned about accuracy in the categorization task than US children. In the present investigation, Study 3 revealed that Chinese children, compared to their US peers, monitor behavior for accuracy more closely and in a wider range of domains, with the cross-cultural differences being more pronounced for the kindergartners. In the same way, Chinese parents, compared to parents in the US, tended to judge transgressions as more severe, to judge more types of transgressions in need of being pointed out, and were more likely to see as core part of a parent's role the need to monitor children for correct behavior. In their survey responses, Chinese parents endorsed the importance of training and of enforcing modesty in their children

to a greater extent than did US parents. Moreover, when categorizing non-ambiguous items, half of the Hong Kong children made at least one spontaneous comment (identical to the US), but *all* of the comments served to correct or refute the unexpected label (double the number in the US). Thus, relative to the US kindergartners, Hong Kong kindergartners appeared more concerned about the accuracy of the label and less open to considering the alternatives suggested by the teacher. Past research corroborates with the above patterns. For example, work based on regulatory focus theory suggests that children who frequently receive praise and encouragement for their successes (normative in US culture) are likely to be promotion-focused and motivated to maximize gains (Higgins & Silberman, 1998). Indeed, US parents have been found to respond positively to their children's successes and downplay their children's failures (Ng et al., 2007). As learners, promotion-focused individuals tend to be more eager, risky, and open to alternatives (Friedman & Forster, 2001). Conversely, children who frequently receive negative feedback for their failures (normative in Chinese culture) are likely to be prevention-focused and motivated to avoid losses. Indeed, Hong Kong parents have been found to downplay their children's successes and respond negatively to their children's failures (Ng et al., 2007). As learners, prevention-focused individuals tend to be more vigilant and cautious, and to monitor their performance more closely for accuracy (Friedman & Forster, 2001). Finally, there may be differences in the types of formal challenges presented to the young children in the US and in Hong Kong. For example, at around the time of data collection, many kindergartners in Hong Kong were preparing (or being prepared by their parents) to attend interviews to earn a spot for

first grade at a good school; these experiences may promote an early awareness of the need to perform accurately and to be competitive. In contrast, US children of such young age are generally shielded from this type of academic pressure. This does not mean that young children in the US do not undergo any evaluation. In fact, at the time of data collection, many US kindergartners were being individually assessed on their reading by their classroom teachers. However, the results of those assessments were more critical for the school (in terms of reading scores compared to statewide averages) than for the individual student. Based on observations in the field, a US kindergartner who struggled on assessments would then be given extra help and attention (such as additional one-on-one reading interventions outside the classroom), whereas a similar kindergartner in Hong Kong would not receive such support (due to staff constraints and the absence of a “parent volunteer” culture) and would also be likely to lose the chance of getting into a good school. All of these factors converge to illustrate how independent and interdependent self-construal may operate via various socialization experiences to shape the children’s respective tendencies to be promotion- or prevention-focused, and how these tendencies guide children to be open to diverse beliefs or be vigilant against error in academic contexts including the current categorization task.

A second, alternative possibility relates to US and Hong Kong kindergartners’ development of a theory of mind. Previous research has reported differences in the developmental progression such that US children tended to pass diverse beliefs tasks earlier than they pass knowledge-ignorance tasks, whereas the progression tends to be reversed in Chinese samples (Liu, Wellman, Tardif, & Sabbagh, 2008; Wellman & Liu,

2004). Recent work by Wang (2010) with Hong Kong children corroborated this pattern, such that in a sample of 75 children aged four to six, 83% passed a knowledge-ignorance task, 61% passed a diverse beliefs task, and 33% passed a contents false belief task. The early competence in understanding diverse beliefs in the US vs. understanding knowledge access in Chinese societies is often attributed to the emphases on appreciating the diversity of individual beliefs (thinking) in independent cultures vs. acquiring shared beliefs and perspectives (knowing) in interdependent cultures. Although cross-cultural patterns found in 6-year-old kindergartners were unlikely to come from an express inability to understand diverse beliefs or ignorance, the divergent emphases on thinking vs. knowing across cultures could influence young children's representation of other people's minds in ways relevant to their response to unexpected testimony. US children may be more ready to consider their own and other people's beliefs as equally valid, and Hong Kong children may be more prone to think that there is only one correct answer so if their own beliefs are extremely certain, then the other person's beliefs are likely to be wrong. However, past work looking at the relationship between theory of mind in terms of false belief understanding and children's trust in testimony have so far produced null findings (Pasquini et al., 2007). The present results suggest that tapping children's understanding of diverse beliefs and knowledge access may be a more promising way to examine the relationship between theory of mind and epistemic trust.

A third possibility related to the contrasting patterns in US and Hong Kong kindergartners concerns executive functioning. Specifically, preschoolers in several

Asian countries (China, Korea, and Japan) have been reported to outperform their peers in the US on various measures of executive functioning, and in particular, inhibitory control (Lewis et al., 2009; Sabbagh, Xu, Carlson, Moses, & Lee, 2006). At the same time, there has been some suggestion in the testimony literature that children's inhibitory control may underlie individual differences in their trust behavior: 3-year-olds with higher inhibitory control scores were better able to suppress their deference to testimony that went against their own perception (Jaswal, personal communication). Therefore, it was possible for the group differences in the US and Hong Kong kindergartners' level of trust in the Non-ambiguous condition to be due in part to group-level differences in their inhibitory control. In other words, this account suggests that kindergartners in the US exhibited such frequent endorsement of unexpected labels for non-ambiguous items because they were less able (than Hong Kong kindergartners and all of the second-graders) to suppress their bias to trusting in a teacher's testimony. Unfortunately, data on executive function were not collected in the current research. Thus, future work should include measures of executive function and theory of mind to enable a thorough examination of potential mediators of children's trust.

Importantly, the possibilities presented here do not necessarily come in conflict with each other, but may operate on different levels of analyses and be mutually reinforcing. In the present case, chronic salience of independence vs. interdependence goals (or promotion vs. prevention foci) in a given cultural context may reinforce culture-specific optimal levels of inhibitory control, and these optimal levels of inhibitory control, in turn, may motivate individuals to behave in accordance with

specific cultural mandates (Kitayama et al., 2009). For example, although both US and Hong Kong kindergartners are expected to raise their hands before answering a question, the expectation tends to be more strictly and frequently enforced in Hong Kong classrooms, in which abundant time is spent on teacher-directed discussion, closed questioning, and ensuring that students offered the right answers (Y. Li, 2004). Thus, answering a question without being asked, and especially if the answer is wrong, is considered more out of line and disrespectful in Hong Kong. Thus, from a young age, Hong Kong children are socialized to be more inhibited in group learning contexts, and this elevated inhibition may enable them to attend more closely to one's role in relation to their encompassing context and the other learners in it, thus exercising interdependence. Indeed, most attempts to explain early cross-national differences in cognitive functioning, such as inhibitory control, look to socio-cultural sources and the experiential level of development for answers (e.g., Lewis et al., 2009; Nelson, 2007).

Nonetheless, several caveats must be acknowledged in the interpretation of the current research findings. First, in the categorization task, the key manipulation of belief strength was implemented in a between-subjects design, which meant that each participant was randomly assigned to either the Ambiguous or the Non-ambiguous condition. This design was chosen to keep the session short and engaging for young children, and to avoid complex carryover effects of item type that would make results challenging to interpret. However, the use of a between-subjects design precludes a direct demonstration that *individual* children altered their levels of trust based on the strength of their prior beliefs. Thus, future work may consider presenting both types of

target items to individual children, and to do so in separate blocks to minimize carryover effects. Nonetheless, the present research provides an important first step to suggest that prior beliefs do play a role in children's decisions to trust an informant's unexpected testimony.

Another limitation is that children were never asked explicitly about what they thought about the teacher or the testimony she provided. There were no systematic data on the extent to which children were convinced about the unplanned nature of the teacher's involvement, and what they thought about the teacher as an informant. At the same time, children's off-task comments to the teacher or the experimenter suggested that participants did acknowledge and believe in the social identity of the "teacher". For example, a number of Hong Kong participants greeted the teacher formally ("Teacher Chan") upon introduction, as Chinese children are socialized to do. In both cultural contexts, children occasionally stopped to inform the teacher about how they were going to be recorded to help teach younger children. Also in both cultures, one or two children expressed to the primary experimenter their frustration with the teacher when the teacher was out of the room (HK-SD16: *"Why did Teacher Chan say that this was a hairbrush?"* or US-DB03: *"Just so you know, she kept saying the wrong thing."*) These comments indicated that children were generally convinced that the teacher was indeed a teacher and her involvement in the categorization task was unplanned. Nonetheless, future work should include more systematic manipulation checks, and incorporate questions such as the ones used in trust-in-testimony studies presented via videos (e.g., "Was she very good or not very good at saying the names of these things?"). Doing so

allows a more direct examination of whether children's trust behavior in the ecological context related to their conscious evaluations of an informant.

One major limitation of the current data is that the cross-cultural differences observed in kindergartners' trust are not completely explained. Whereas group-level differences were demonstrated between US and Hong Kong participants in terms of their trust-relevant perceptions and attitudes, precise mediation relationships at the individual level were not found. To enable a more effective test of these relationships, larger sample sizes and more precise instruments that target constructs of interest may be necessary. For example, parental ratings of transgression severity were found to correlate negatively with children's level of endorsement in the Non-ambiguous condition. However, these severity ratings were produced by averaging across five types of transgressions. The current data show that US and Hong Kong parents differed the most in their severity ratings for the hypothetical scenario about a teacher's labeling error. This is the scenario that most closely resembles the teacher's testimony in the categorization task. In future studies, including a larger number of scenarios of this kind will allow the construction of more effective scales amenable to mediation analyses.

The present investigation may be seen as beginning steps into several avenues of future research. First, the current investigation revealed intriguing cross-cultural differences at kindergarten age. It will be interesting to look at younger children, such as preschoolers, in Hong Kong to clarify the beginnings of Chinese children's epistemic vigilance. Taking this step will help us understand the relative contributions of family

socialization, formal schooling and other factors in the development of culturally representative learning behavior.

Next, although young children do spend a significant amount of time learning about the identities and functions of different things, a rich extant literature shows that children's conceptual development involves so much more. Of particular interest are scientific concepts that are difficult to reconcile with children's perceptually based beliefs. An often cited example of these concepts involves children's knowledge about the shape of the earth, which has been given much attention in the science education literature ever since a fascinating portrayal of children's transition through a series of working theories or mental models (Vosniadou & Brewer, 1982). However, the very existence of mental models is still being debated today (Hannust & Kikas, 2010; Nobes et al., 2003). At the same time, regardless of whether developing concepts are represented as coherent models or as fragments of information, updating beliefs based on incoming testimony is still a necessary step for children in their knowledge acquisition. Connecting the work on trust in testimony and the work on science education will shed helpful light on the mental models debate, enable a more detailed look at the process of reconciliation, as well as extend the relevance of trust-in-testimony research beyond the domain of object labels or function to more complex concepts that children also acquire in their everyday experiences.

Furthermore, it will be interesting to explore whether the role of prior beliefs on trust might be moderated by the identity of the informant and various aspects of the

context. Developmental studies on children's help-seeking preferences (e.g., Nelson-LeGall & Gumerman, 1984; Newman, 2000) and their authority concepts (e.g., Yau & Smetana, 2008) suggest that young children prefer to obey and to seek help from some types of people more than others, and that their preferences shift as they grow older (and contexts such as school become more a prominent part of their lives) and also in different situations. In the present dissertation, the informant was always a teacher. Would children demonstrate a similar pattern of epistemic trust if the unexpected testimony had come from their peers, or from their own parents? In what kinds of learning situations might children be more willing to consider unexpected testimony (even radically new ideas) presented by peers, the teacher, or "experts"? How does the nature of prior knowledge interact with these learning situations? An account of the dynamics among these factors may inform pedagogical decisions.

Finally, the present research reiterates the benefits of examining children's trust in testimony from a contextual perspective. Results demonstrate that even children's knowledge acquisition, though predominantly studied in laboratory settings, is never entirely context-free. The task context, socialization factors, and culture-specific emphases all contribute to influence children's tendency to trust in other people's testimony. For this investigation, the social ecological model (Bronfenbrenner & Morris, 1998) also served as an effective way of conceptualizing the various contexts (ecological, social, developmental, and cultural) of interest. Although taking multiple contexts into consideration necessarily adds complexity to the picture, it may indeed be a *necessary*

complexity that enables a more truthful look at the social cognitive phenomenon of children's trust in testimony.

Figure 2.1 Mean proportion of trials (out of 4) on which US preschoolers endorsed a teacher's unexpected label.

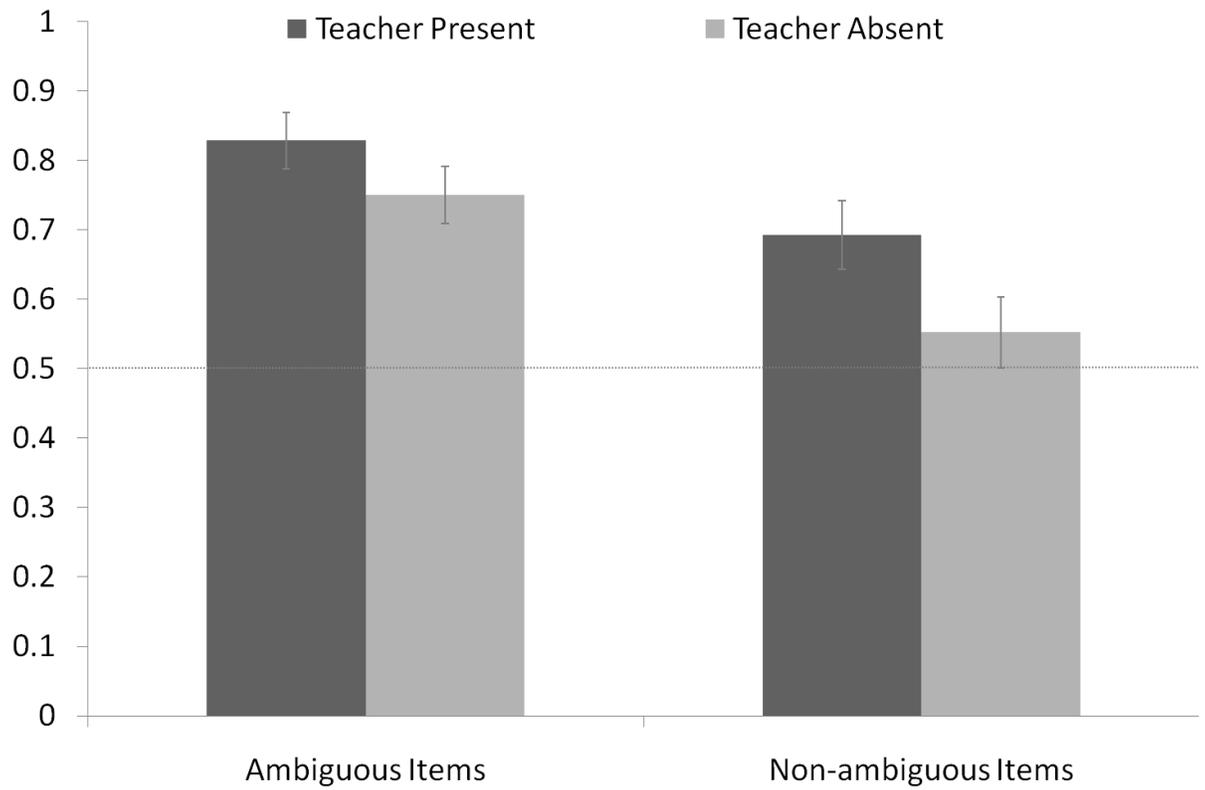


Figure 2.2 Mean duration (*ms*) for preschoolers to make a categorization response for baseline and target items.

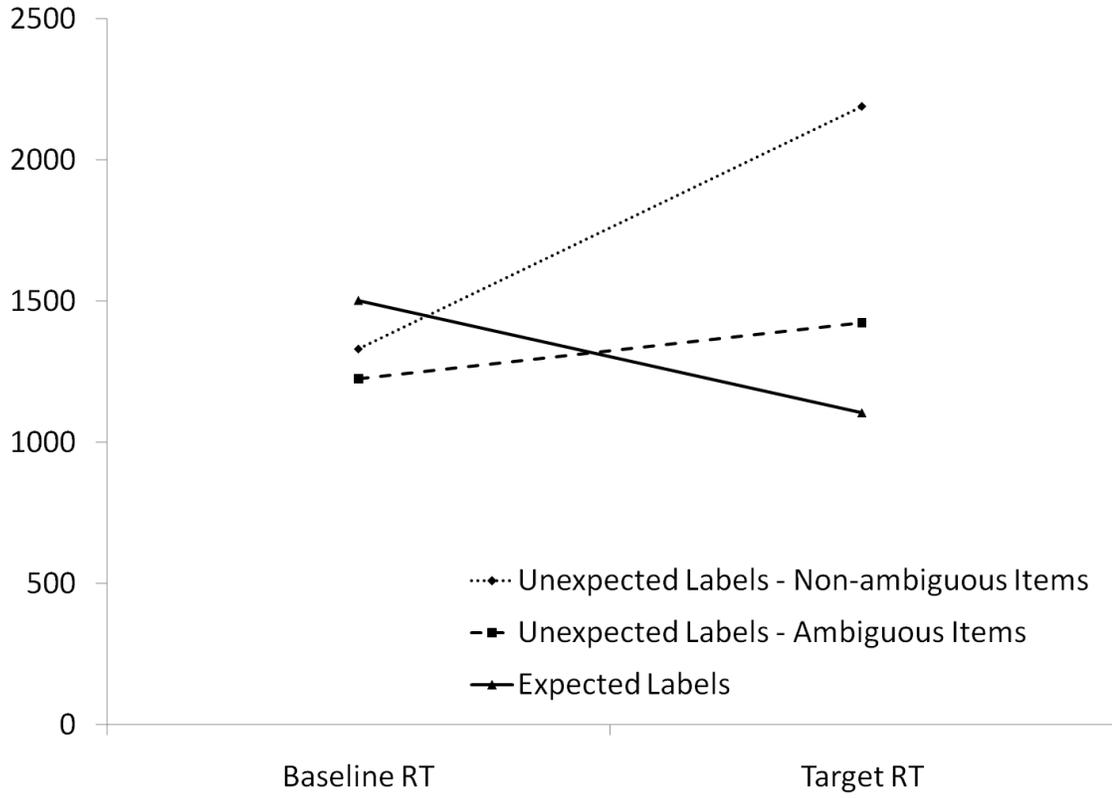


Figure 3.1. Mean proportion of trials (out of 4) on which US and Hong Kong children endorsed a teacher's unexpected label.

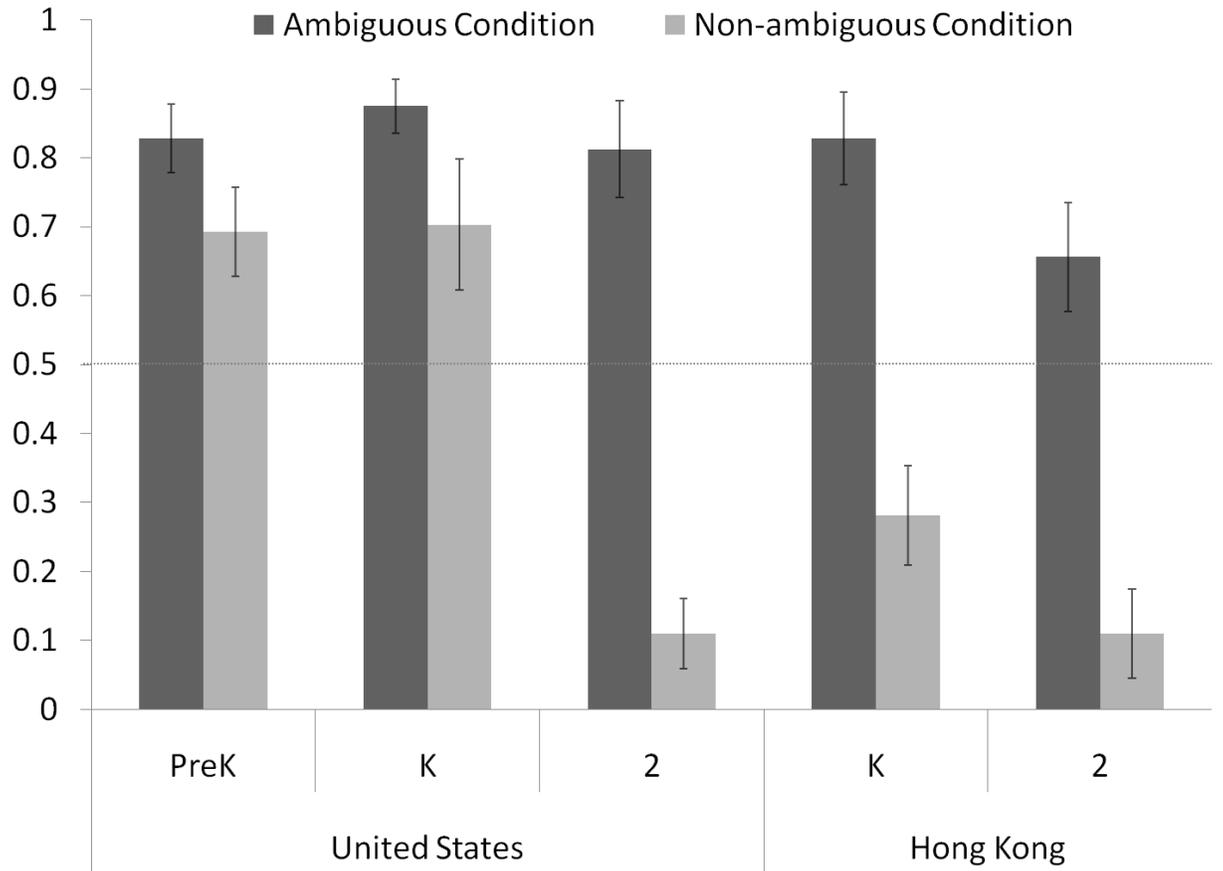


Figure 3.2 Mean proportion of trials (out of 4) on which US kindergartners endorsed a teacher's unexpected label.

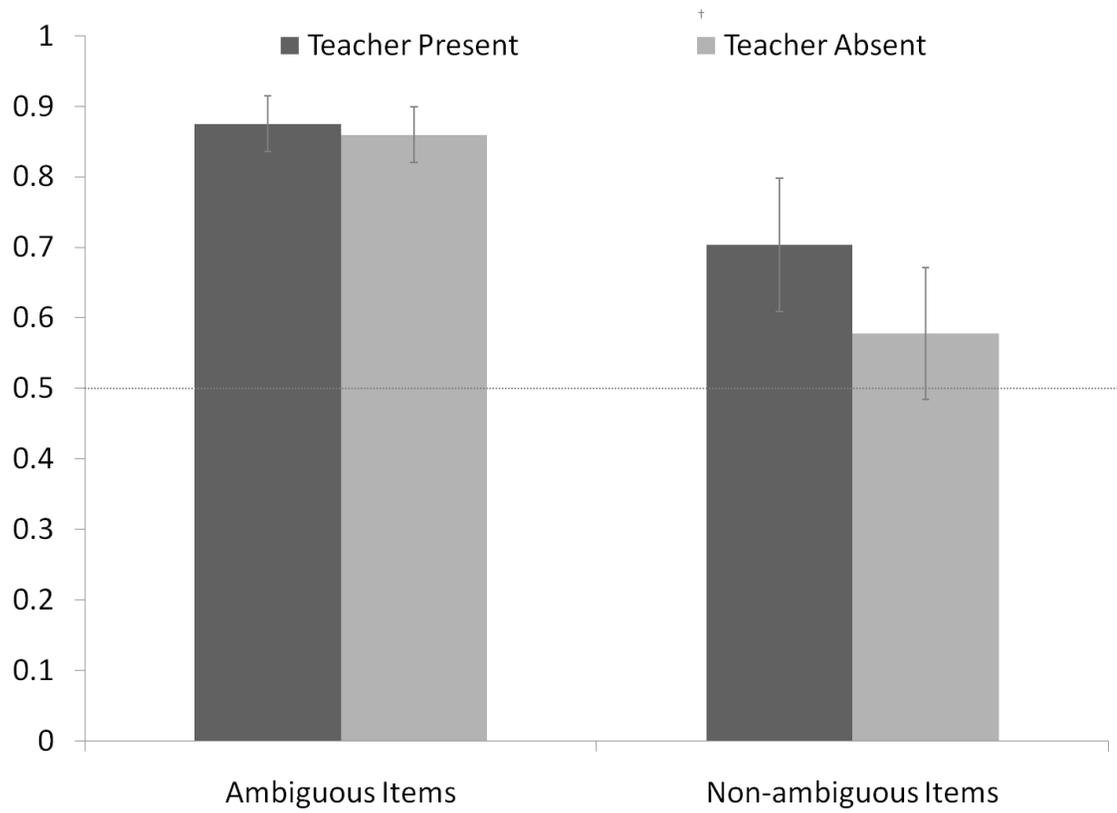


Figure 3.3 Mean proportion of trials (out of 4) on which US second-graders endorsed a teacher's unexpected label.

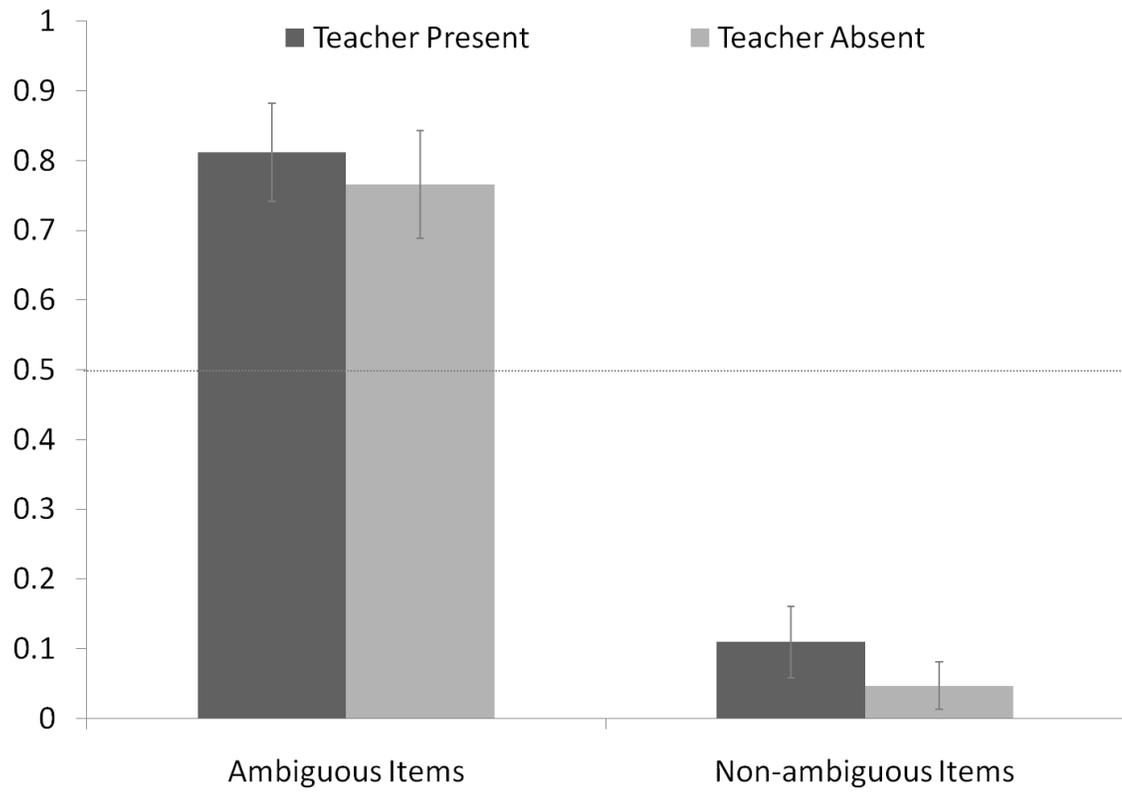


Figure 3.4 Mean proportion of trials (out of 4) on which Hong Kong kindergartners endorsed a teacher's unexpected label.

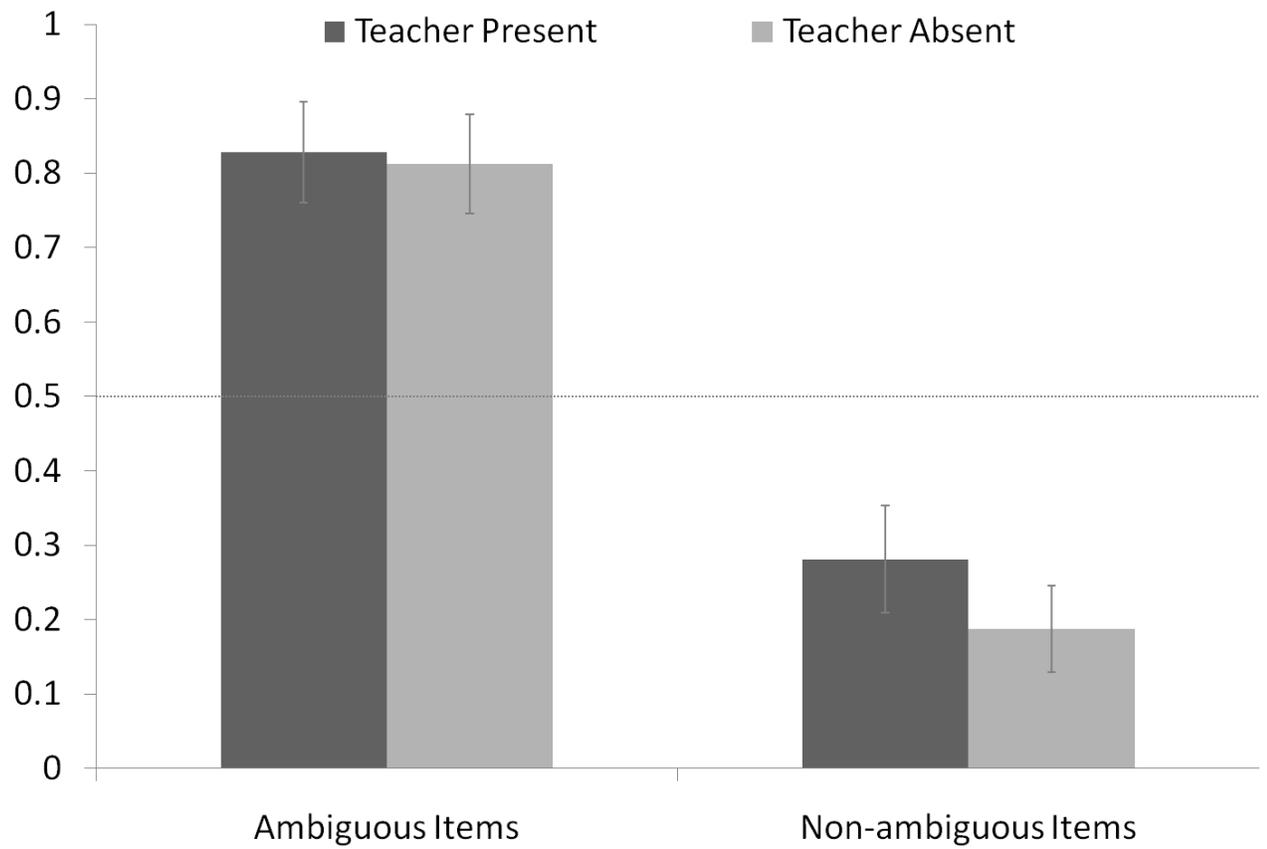


Figure 3.5 Mean proportion of trials (out of 4) on which Hong Kong second-graders endorsed a teacher's unexpected label.

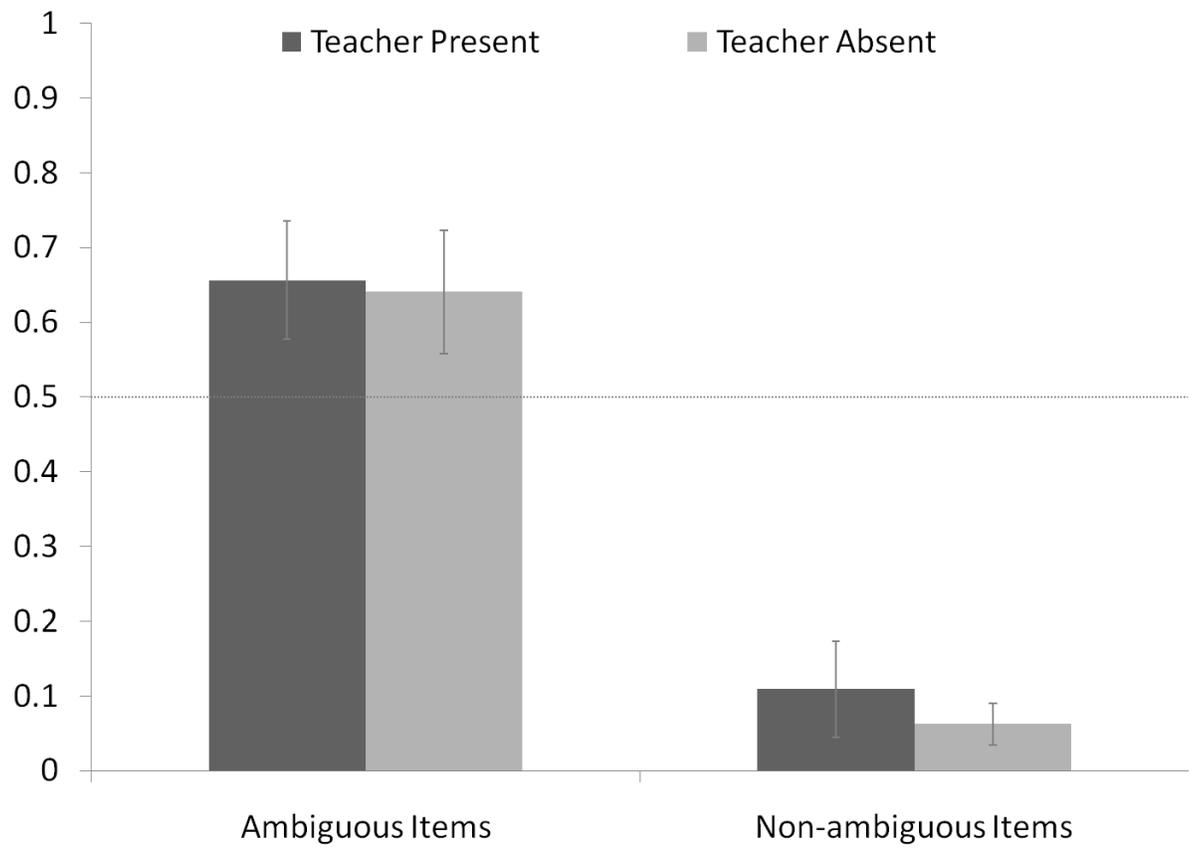


Figure 3.6 Mean duration (*ms*) for US kindergartners (top panel) and second-graders (bottom panel) to make a categorization response about baseline and target items.

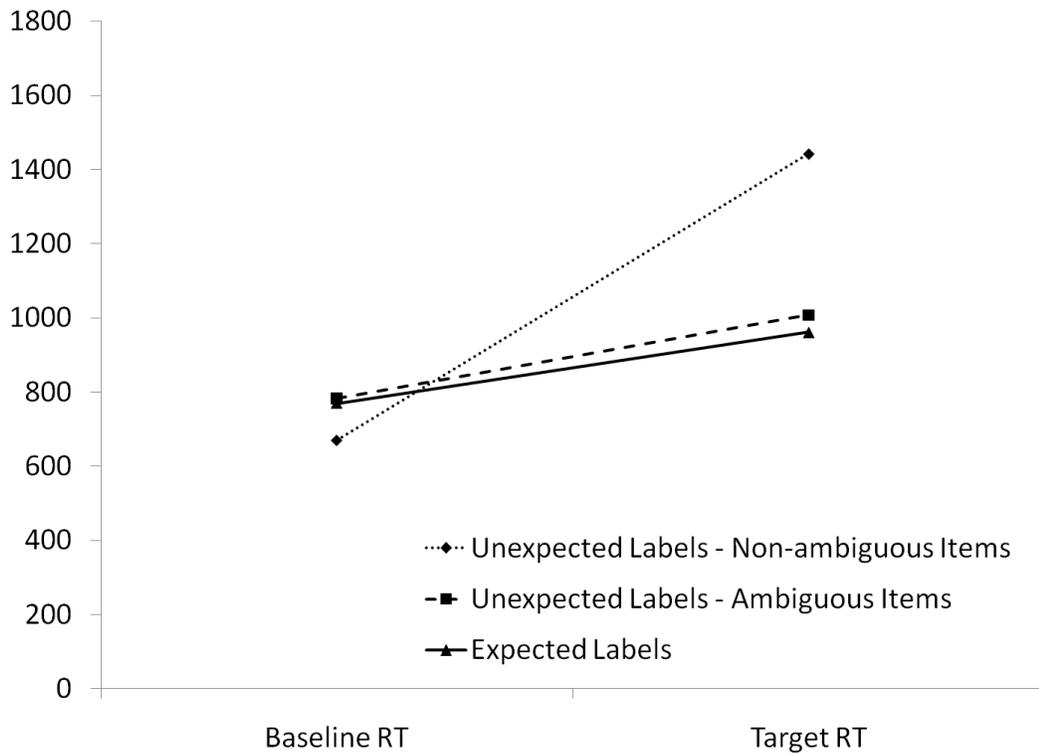
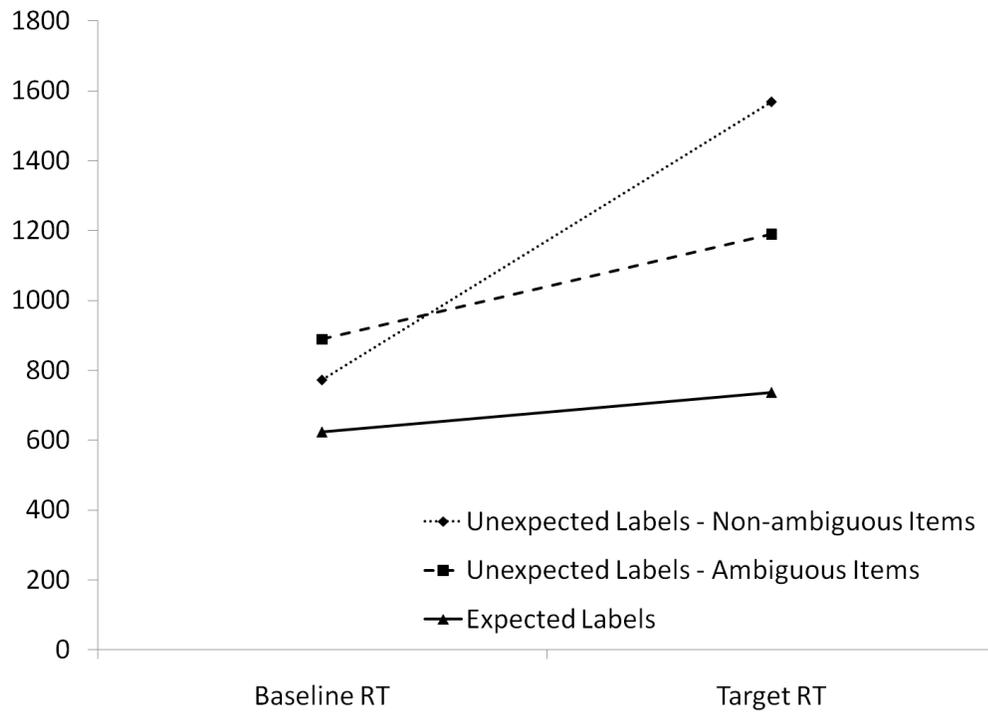


Figure 3.7 Mean duration (*ms*) for Hong Kong kindergartners (top panel) and second-graders (bottom panel) to make a categorization response about baseline and target items.

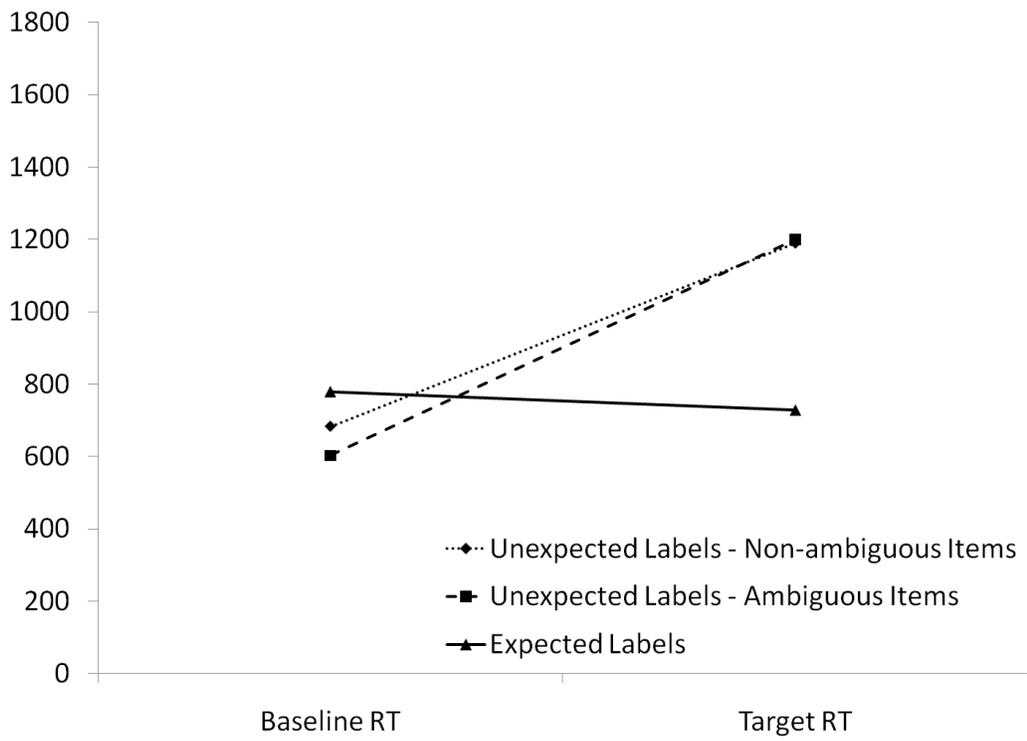
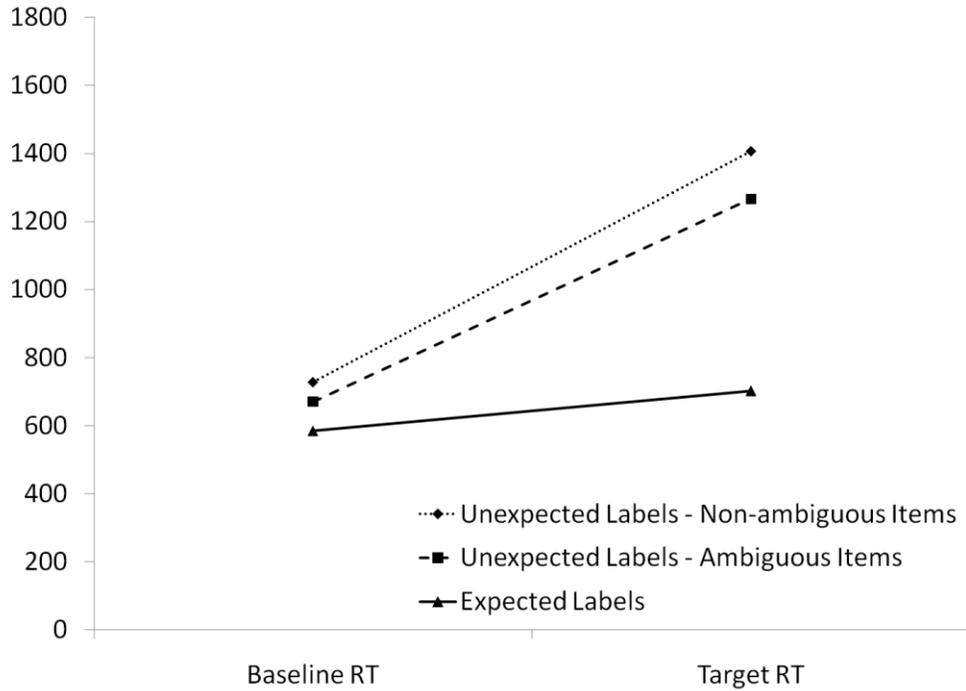
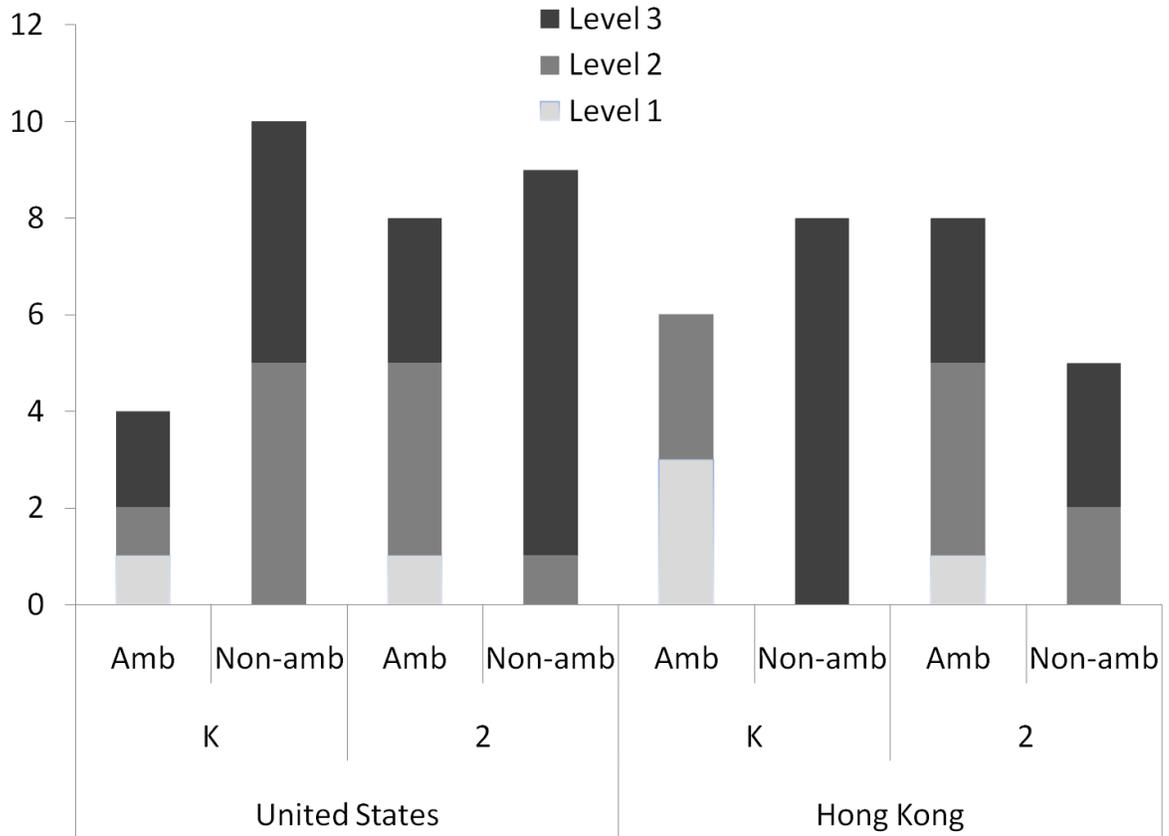


Figure 3.8 Total numbers of children who made spontaneous comments in response to unexpected testimony



Note: Comments were categorized into three levels, with 1 expressing surprise or acceptance of unexpected label, 2 expressing conceptual doubt, and 3 expressing the child's assertion of their own beliefs or refutation of the unexpected label.

Figure 4.1 Proportion of children who believed that a teacher should be confronted about her transgression, in the US (top panel) and in Hong Kong (bottom panel).

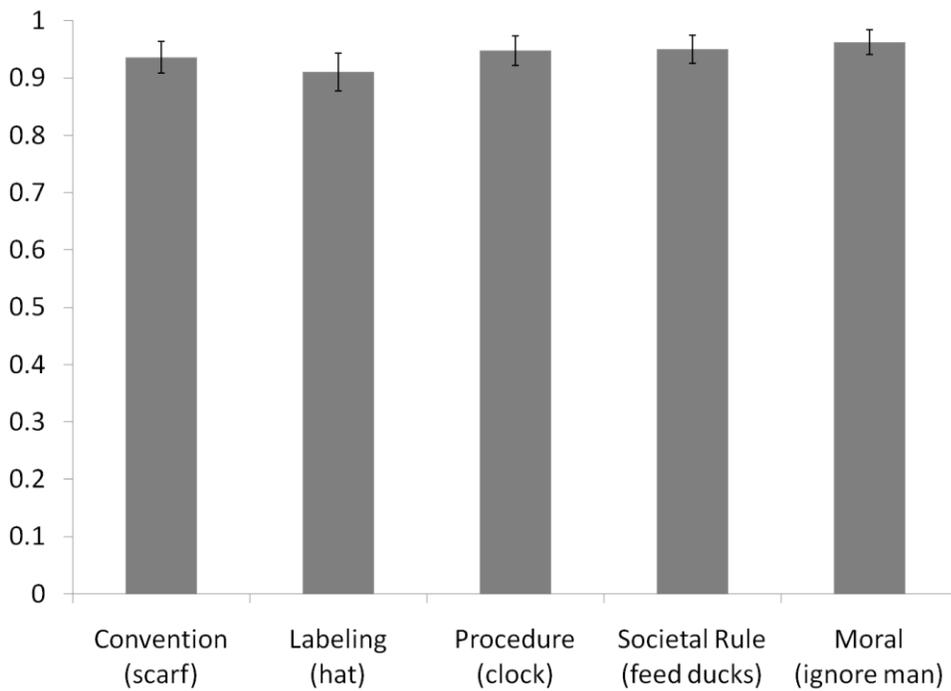
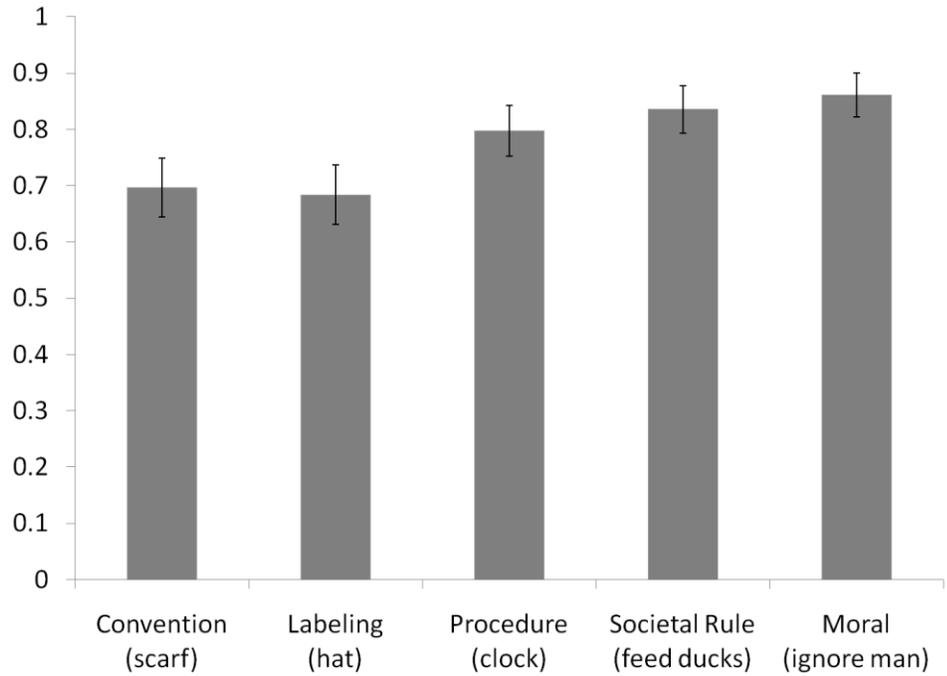


Figure 4.2 Proportion of parents who believed that a teacher should be confronted about her transgression, in the US (top panel) and in Hong Kong (bottom panel).

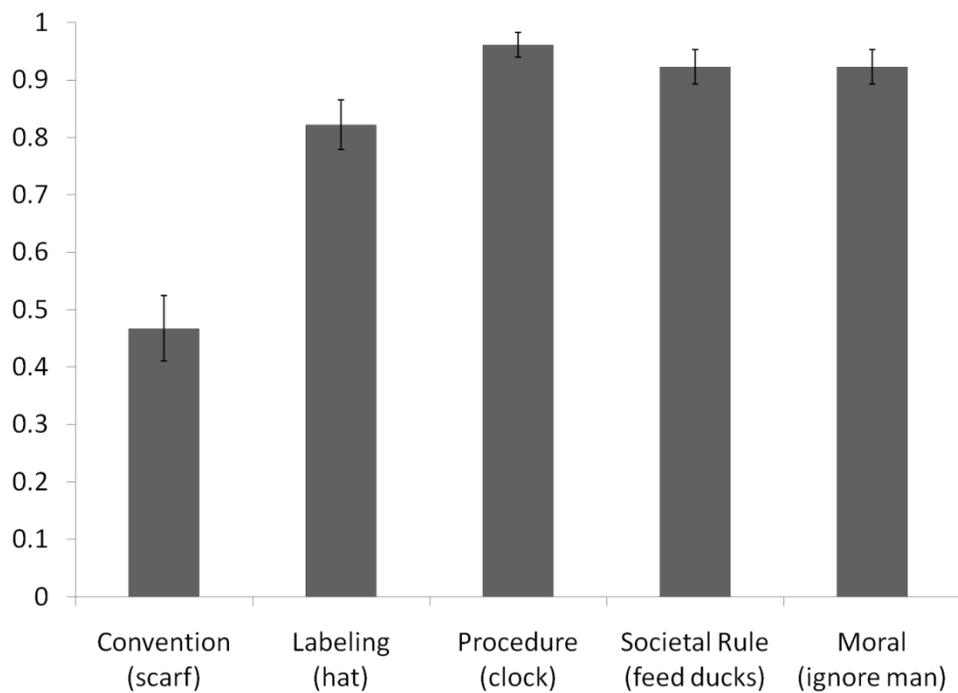
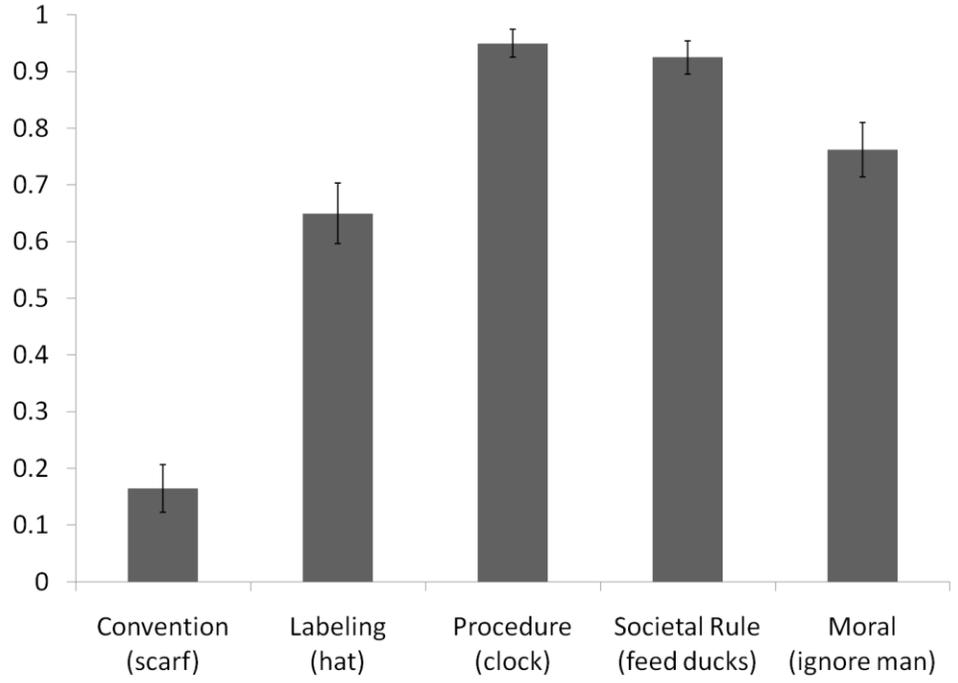


Table 3.1 Number of children who endorsed a teacher's unexpected labels for target items on 0, 1, 2, 3, or 4 trials in the computer task.

Location	Item Type	Age	Total number of trials in which children endorsed labels					<i>n</i>
			0	1	2	3	4	
United States	Ambiguous	PreK	0	0	3	5	8	16
		K	0	0	1	6	9	16
		2	0	2	2	2	10	16
	Non-ambiguous	PreK	1	1	5	4	5	16
		K	2	2	1	3	8	16
		2	12	1	3	0	0	16
Hong Kong	Ambiguous	K	1	0	1	5	9	16
		2	1	2	4	4	5	16
	Non-ambiguous	K	6	5	2	3	0	16
		2	12	3	0	0	1	16

Table 4.1 Proportion of children and their parents who responded that the teacher should be confronted about her transgression.

	US Parent	HK Parent	US Child	HK Child
	<i>Mean (SE)</i>	<i>Mean (SE)</i>	<i>Mean (SE)</i>	<i>Mean (SE)</i>
<i>When a teacher wore a scarf on her waist:</i>				
Kindergarten	.10 (.05)	.45 (.08) **	.69 (.08)	.90 (.05)*
Grade 2	.23 (.07)	.49 (.08)*	.70 (.07)	.97 (.03)**
<i>When a teacher called a cup a hat:</i>				
Kindergarten	.62 (.08)	.75 (.07)	.67 (.08)	.87 (.05)**
Grade 2	.68 (.08)	.90 (.05)*	.70 (.07)	.95 (.04)**
<i>When a teacher read the clock wrong:</i>				
Kindergarten	.95 (.04)	.95 (.04)	.72 (.07)	.92 (.05)*
Grade 2	.95 (.04)	.97 (.03)	.87 (.05)	.97 (.03)
<i>When a teacher broke a "No Feeding" rule:</i>				
Kindergarten	.90 (.05)	.93 (.04)	.79 (.06)	.90 (.05)
Grade 2	.95 (.04)	.92 (.04)	.87 (.05)	1.00 (0) *
<i>When a teacher did not help an old man who fell:</i>				
Kindergarten	.70 (.07)	.90 (.05)*	.84 (.06)	.95 (.04)
Grade 2	.83 (.06)	.95 (.04)	.87 (.05)	.97 (.03) *

Asterisks denote that differences across cultural contexts were significant at

*p < .05, or **p < .01

Table 4.2 Types of children’s explanations for not confronting a teacher about her mistakes, in descending order of frequency.

Type of explanation	# Tokens	Example
Emotion-focused	28	<i>Because it would hurt her feelings. She doesn't want her to feel bad.</i>
Punishment Avoidance	14	<i>Because she doesn't want to get in trouble. Because she might get suspended. 因為如果出聲，老師會鬧佢 tr: Because the teacher would tell (Aidan) off.</i>
Politeness-focused	13	<i>Because it wouldn't be polite. Because it's bad manners.</i>
No explanation	12	<i>I don't know.</i>
Explain or Reframe Behavior	10	<i>Because she looks at the clock differently. 都啱嘅，因為下面有個紫色嘅嘢 tr: She could be right, because there's a purple thing at the bottom.</i>
Respect of personal choice	6	<i>Because I don't like when teachers tell me, I don't care this is how I wear it.</i>
Inadequacy	5	<i>Because (Aidan) doesn't notice that she has it on wrong. 因為明明怕醜 tr: Because Ming Ming was shy.</i>
Mind-reading	4	<i>Aidan didn't want the teacher to feel like he thinks she's weird.</i>
Social Norms	3	<i>因為唔出聲係一個好孩子 tr: Because a good child doesn't speak up.</i>
Others	6	<i>If Aidan tells his teacher "Hey, you can't feed the ducks.", she might have to dive in, and Aidan could be standing behind a sign that says "No Swimming".</i>

Table 4.3 Children’s transgression-focused vs. prosocial-focused explanations in relation to the type of transgression.

		Transgression focus (TF)	Prosocial focus (PF)	TF : PF ¹
<u><i>When a teacher wore a scarf on her waist:</i></u>				
Kindergartners	US	18	8	2.2
	HK	26	6	4.3
Second-graders	US	11	16	0.7
	HK	14	22	0.6
<u><i>When a teacher called a cup a hat:</i></u>				
Kindergartners	US	17	7	2.4
	HK	30	6	5.0
Second-graders	US	17	12	1.4
	HK	16	20	0.8
<u><i>When a teacher read the clock wrong:</i></u>				
Kindergartners	US	18	9	2.0
	HK	30	3	10.0
Second-graders	US	12	21	0.6
	HK	17	20	0.9
<u><i>When a teacher broke a “No Feeding” rule:</i></u>				
Kindergartners	US	21	8	2.6
	HK	31	4	7.7
Second-graders	US	18	16	1.1
	HK	17	22	0.8
<u><i>When a teacher did not help an old man who fell:</i></u>				
Kindergartners	US	19	14	1.4
	HK	24	13	1.8
Second-graders	US	14	21	0.7
	HK	8	31	0.3
Totals				
Kindergartners	US	93	46	2.0
	HK	141	32	4.4
Second-graders	US	72	86	0.8
	HK	72	115	0.6

¹ Ratio of the number of transgression-focused explanations to the number of prosocial-focused explanations. Higher ratios denote a greater bias to a transgression focus.

Table 4.4 Parental severity ratings of each transgression on a scale of 0 to 10, grouped by culture and children's age.

	US Parents	HK Parents
	<i>Mean (SE)</i>	<i>Mean (SE)</i>
<i>When a teacher wore a scarf on her waist:</i>		
Kindergarten	.53 (.14)	1.28 (.45)
Grade 2**	1.00 (.35)	3.81 (.68)
<i>When a teacher called a cup a hat:</i>		
Kindergarten**	1.80 (.45)	5.64 (.68)
Grade 2**	1.83 (.45)	7.34 (.56)
<i>When a teacher read the clock wrong:</i>		
Kindergarten**	4.77 (.55)	7.41 (.57)
Grade 2**	5.18 (.58)	7.74 (.53)
<i>When a teacher broke a "No Feeding" rule:</i>		
Kindergarten*	6.95 (.46)	8.28 (.47)
Grade 2**	7.33 (.42)	8.53 (.42)
<i>When a teacher did not help an old man who fell:</i>		
Kindergarten	9.33 (.18)	9.21 (.38)
Grade 2*	9.00 (.36)	9.87 (.08)

Asterisks denote that differences across cultural contexts were significant at *p < .05, or **p < .01

Table 4.5 Estimated and actual proportions of parents who wanted their children to point out a teacher’s transgression, grouped by culture and transgression type.

	US Parents	HK Parents
	<i>Mean (SE)</i>	<i>Mean (SE)</i>
<i>When a teacher wore a scarf on her waist:</i>		
Estimated	.27 (.02)**	.49 (.04)
Actual	.16 (.04)	.47 (.06)
<i>When a teacher called a cup a hat:</i>		
Estimated	.57 (.03)	.71 (.04)*
Actual	.65 (.05)	.81 (.05)
<i>When a teacher read the clock wrong:</i>		
Estimated	.81 (.02)**	.85 (.03)**
Actual	.95 (.03)	.97 (.02)
<i>When a teacher broke a “No Feeding” rule:</i>		
Estimated	.68 (.03)**	.76 (.03)**
Actual	.93 (.03)	.94 (.03)
<i>When a teacher did not help an old man who fell:</i>		
Estimated	.77 (.03)	.83 (.03)**
Actual	.76 (.05)	.93 (.03)

Asterisks denote the estimated and actual proportions were significantly different at *p < .05, or **p < .01

Table 4.6 Parenting attitudes and styles grouped by culture and children's age.

Measures	US		HK		Difference (US – HK)	Statistics (<i>F</i> (1, 155))
	Mean (SD) α		Mean (SD) α			
Authoritative Parenting	4.81 (.41) .61		4.97 (.40) .66		- 0.16	<i>F</i> (1, 155) =5.96 <i>p</i> = .016
	K**	4.75 (.42)		5.08 (.41)		
	2	4.87 (.39)		4.86 (.35)		
Filial Piety	4.49 (.59) .73		4.45 (.49) .73		+ 0.04	<i>F</i> (1, 155) =.18 <i>p</i> = .668
	K	4.53 (.59)		4.39 (.53)		
	2	4.44 (.59)		4.50 (.45)		
Modesty	2.06 (.41) .23		2.53 (.64) .68		- 0.47	<i>F</i> (1, 155) =27.79 <i>p</i> <.001
	K*	2.03 (.37)		2.28 (.55)		
	2**	2.10 (.45)		2.76 (.65)		
Training	4.37 (.63) .66		4.83 (.44) .59		- 0.46	<i>F</i> (1, 155) =29.28 <i>p</i> <.001
	K**	4.35 (.71)		4.85 (.48)		
	2**	4.40 (.54)		4.82 (.41)		

Superscripts denote that differences across cultural contexts were significant at
p* < .05, or *p* < .01

Table 4.7 Bivariate correlations overall and controlled for age (in parentheses) collapsed across conditions ($N = 128$).

	1	2	3	4	5	6	7	8	9	10
1. Proportion of Endorsement	--									
2. Number of Comments	-.21* (-.20*)	--								
3. Intensity of Comments	-.22* (-.23*)	.80** (.79**)	--							
4. Authoritative Parenting	.22* (.19*)	.01 (.00)	-.03 (-.04)	--						
5. Filial Piety	.06 (.09)	-.05 (-.07)	.01 (-.01)	.05 (.05)	--					
6. Training	-.01 (-.03)	-.08 (-.07)	-.09 (-.08)	.12 (.12)	.43** (.44**)	--				
7. Encouragement of Modesty	-.18 (-.18)	.00 (-.02)	.11 (.09)	-.37** (-.35**)	.05 (.04)	.06 (.07)	--			
8. Transgression Severity (Parent)	-.20* (-.21*)	.04 (.03)	.05 (.03)	-.23** (-.23*)	.16 (.16)	.29** (.31**)	.31** (.31**)	--		
9. Should Tell Teacher (Parent)	-.15 (-.17)	.11 (.09)	.07 (.06)	-.06 (-.08)	-.02 (-.02)	.19* (.20*)	.14 (.13)	.45** (.46**)	--	
10. Should Tell Teacher (Child)	-.16 (-.15)	-.12 (-.12)	-.01 (.00)	.12 (.16)	-.12 (-.12)	.04 (.04)	.08 (.06)	.17 (.17)	.19* (.21*)	--

Table 4.8 Bivariate correlations controlled for age in the Ambiguous and Non-ambiguous (in parentheses) conditions ($N = 64$).

	1	2	3	4	5	6	7	8	9	10
1. Proportion of Endorsement	--									
2. Number of Comments	.10 (-.09)	--								
3. Intensity of Comments	-.02 (-.16)	.85** (.77**)	--							
4. Authoritative Parenting	.18 (.44**)	-.03 (-.01)	-.01 (-.15)	--						
5. Filial Piety	.13 (-.06)	.06 (-.12)	-.02 (.01)	.08 (.01)	--					
6. Training	-.12 (-.17)	-.10 (.00)	-.09 (-.01)	.14 (.12)	.31* (.54**)	--				
7. Encouragement of Modesty	-.10 (-.21)	.10 (-.10)	.17 (.03)	-.34** (-.40**)	-.17 (.19)	-.13 (.22)	--			
8. Transgression Severity (Parent)	-.17 (-.27*)	-.01 (.03)	-.03 (.10)	-.16 (-.29*)	-.01 (.30*)	.37** (.29*)	.13 (.42**)	--		
9. Should Tell Teacher (Parent)	-.21 (-.14)	.10 (.07)	.10 (.03)	-.08 (-.07)	-.08 (.04)	.32* (.12)	.08 (.16)	.34** (.57**)	--	
10. Should Tell Teacher (Child)	-.13 (-.11)	-.17 (-.18)	-.01 (-.08)	.18 (.08)	-.23 (.02)	.17 (-.08)	.13 (-.01)	.25* (.12)	.24 (.17)	--

Appendix A: Materials used in the Computer Task

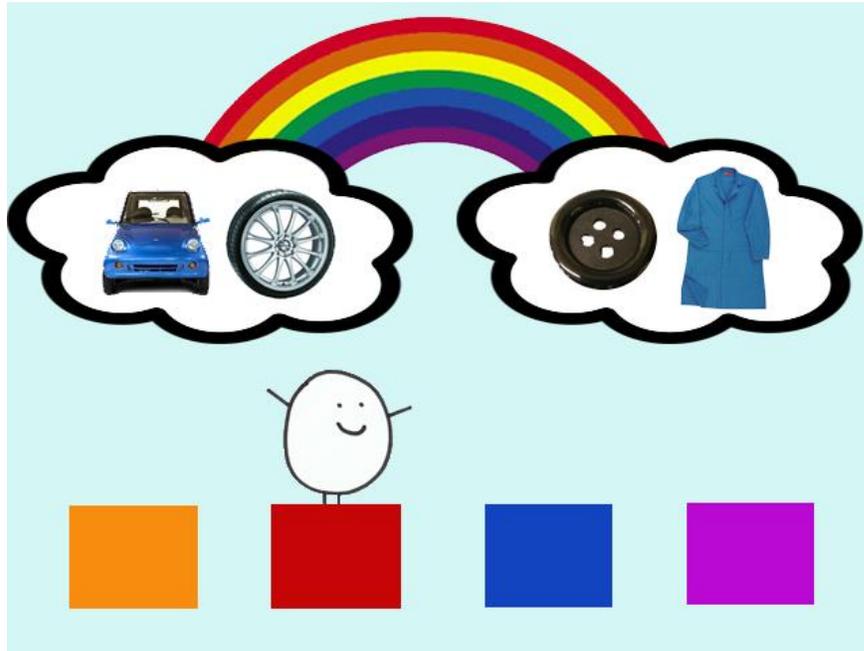
I. List of Standard and Target items and labels presented by the teacher using a standardized question frame: *Where do you think this X goes?*

Category	Standard 1	Standard 2	Ambiguous Condition	Non-Ambiguous Condition
Buttons vs. Wheels	 <i>Button 鈕</i>	 <i>Wheel 轆</i>		 <i>Wheel 轆</i>
Hairbrushes vs. Toothbrushes	 <i>Hairbrush 梳</i>	 <i>Toothbrush 牙刷</i>		 <i>Hairbrush 梳</i>
Tables vs. Chairs	 <i>Table 檯</i>	 <i>Chair 凳</i>		 <i>Chair 凳</i>
Socks vs. Mittens	 <i>Socks 襪</i>	 <i>Mittens 手套</i>		 <i>Mittens 手套</i>

* Ambiguous target items were given labels that conflicted with children's self-generated labels in a preceding picture book activity.

II. Example of a start screen (top) and a picture prompt (bottom) presented in the computer game.

(a)



(b)



Appendix B: Protocol used in Studies 1 and 2

I. Protocol in English for US preschoolers and kindergartners

II. Protocol in English for US second graders

III. Protocol in Chinese (Cantonese) for Hong Kong kindergartners

IV. Protocol in Chinese (Cantonese) for Hong Kong second graders

I. Protocol in English for US preschoolers and kindergartners (Studies 1 and 2)

Introduction to the Teacher and Game

E1: First, I am going to show you some pictures in a book, and I want you to tell me what you see in each picture. Some of them are things you may not have seen before, so if you don't know what it is, just tell me you don't know. Okay? What is this? (pause) What is it used for? (repeat through all of the pictures)

Great job! Now let's get started with our computer game. *[click]*

[T enters room]

E1: Oh hello Miss _____! I didn't know you'd be working in here. Do you mind if we also use this room?

T: No not at all, I'll just be in and out. (pause) Oh I've taught this game to my class before!

E1: Oh really? It's a great game. (to CH): This is Miss _____, she's a teacher from another school. *[T smiles at child, then goes to her work]* Let's get started with our computer game.

E1: This game is about different kinds of things and what they are used for. First, I'll show you how to play the game. Then, since you're a big kid, I'll use your answers to teach younger kids how to play the game.

Warm-up Trials

E1: Let's do a practice round first. *[click]*

- Does the fish live in the water or on a tree?

[When you know the answer, press the green button, and then pick your answer.]

- Do you use a key with a door or with a book?
- Do you put candles on a pillow or on a cake?

E1: Good job! Now that you know how to play, let's play the same round again, but this time I'm going to use *this* machine to record your answers, so that you can teach younger kids how to play the game. I'm going to turn it on and say "Go!", then you can start.

E1: Ready? Go! *(CH plays the warm-up trials)* That was great! You were a great teacher!

Core Trials

E1: There are 4 more rounds in this game. This one is about [A] and [B]. I need to get a new recorder for this round, so why don't you practice until I come back? Miss _____, would you mind helping X practice the game?

T: Of course! (When alone with child) Oh I've seen this round before. You need to match the [A] with the [A-Match], and match the [B] with the [B-Match]. *[click]*

- Standard: Where do you think this [A] goes?
- Standard: Where do you think this [B] goes?
- Target: Where do you think this [A/B] goes?

**Neutral Responses Always: Okay! [if child questions, repeat Target question once, and if child keeps questioning, "Where do you think it goes?"]*

E1: Thank you Miss _____!

T: (to E1) You're welcome. I need to go back and do some work now.

E1: (to child) Ready to teach younger kids how to play this round? *[click]* Ready? GO!

Subsequent Trials

E1: Good job, you've reached a new round! This one is about [C] and [D]. I need to get a new recorder for this round, so you can practice while I'm gone? [variations: Miss ___, would you mind sitting with ___ again? OR T offers help]

T: (when alone with child) Now OR Let's see You need to match the [C] with the [C-Match], and the [D] with the [D-Match]. *[click]*

- Standard: Where do you think this [C] goes?
- Standard: Where do you think this [D] goes?
- Target: Where do you think this [C/D] goes?

E1: Thanks again, Miss _____!

T: (to E1) You're welcome. I need to go back and do some work now.

E1: (to child). Ready to teach the younger kids how to play this round? Okay, GO!

E1: Great job! Thank you so much for being a great helper.

II. Protocol in English for US second graders (Study 2)

Session One

E1: I am going to show you some pictures in a book, and I want you to tell me what you see in each picture. Some of them are things you may not have seen before, so if you don't know what it is, just tell me you don't know. Okay?

What is this? (Go through all pictures)

In the second part, we are going to think about what each thing is used for.

What is it a part of? Jacket/Car

What goes on/in it? Dishes/Sitting man, Milk/Flowers

What is it used for? Teeth/Hair, Hands/Feet

That was fast! I'm going to pick some of the pictures to make a computer game, and use the game to teach preschool kids about different things and what they're used for. Next time I visit the school, I'm going to invite you to help me try out the game. \

Session Two

E1: Remember this book? I picked some of the pictures to make a computer game. I'll be using the computer game to teach preschool kids about different things and what they're used for. Today I want you to help me try out the game. First, we'll learn the game together.

Now let's try a practice round: In this round, the rule is to match (pointing) all the vases with the flowers, and all the cups or glasses with the milk. Can you remember that? If you do, go ahead and press on this guy to begin.

Where does this VASE go?

(When you know the answer, press the green button, and then pick your answer.)

Where does this CUP go?

Where does this GLASS go?

That was fast! Now we're going to play the same round one more time, and this time I'm going to make a video to record your answers, and use it to teach preschool kids how to play the game. When I say GO, go ahead and press here to start. Ready, GO! *(CH plays the warm-up trials)*

E1: Now let's take a look at the video. (press CALL button for T) That was great! Now there're four more rounds in this game. Just like before, we're going to practice all of them first, and then we'll make a video to record your answers.

Introduction to the Teacher

[Teacher enters]

T: Excuse me, are you Miss _____? There's a phone call for you in the school office (or: _____ wants to check with you about something).

E1: (hesitates) Are you a teacher here?

T: I'm Miss _____ – I'm a teacher at another school. I'm helping here today.

E1: I see. Let me run to take the call/check with _____. Miss _____, would you mind helping _____ practice this game?

T: Sure.

E1: Thanks. Here're the instructions for the game. I'll be right back!

Core Trials

T: Thanks. Let's see. In this round, you need to match all the [A] with the [A-match], and all the [B] with the [B-match]. When you remember the rule, go ahead and press here to start. *[from this point on, focus gaze on picture prompts]*

- Where does this [A/B] go?
- Where does this [A/B] go?
- Where does this [A/B] go?

Okay. In this round, you need to match all the [C] and the [C-match], and all the [D] with the [D-match]. When you're ready, press here to start. *[continue until end of round 4]* I think we've done all four rounds. [press CALL button for E1]

E1: I'm back. Thanks so much!

T: Not a problem. I need to go back and work on something else now.

E1: Done practicing all four rounds? Now we're going to play the four rounds again, and this time I'll make a video to record your answers, so that we can teach preschool kids how to play the game. When I say GO, you can start and play the four rounds in a row. Ready? GO!

III. Protocol in Cantonese Chinese for Hong Kong kindergartners (Study 2)

Introduction to the Teacher and Game

E1 brings CH into research room.

E1: 呢本書叫做“這是甚麼？”，裡面版版都有唔同嘅物件。如果你認得出，就要話俾我聽你見倒 D 乜。有 D 物件可能係你未見過嘅，如果你未見過呢，就話俾我聽你唔知道，咁就得㗎喇。明唔明白呀？呢個係乜嘢嘢？呢個用來做乜嘢嘢？係 __ 定係 __?)

E1: 做得好好嗎！而家等我哋試下呢個電腦遊戲啦。 <moves computer forward>

<T enters room with some task on hand>

E1: 嘍，__ 老師，你係咪要用這間房呀？我哋會唔會阻住你呀？

T: 啊，唔緊要！我入來做少少野咋，你哋繼續啦。 <notices computer game> 嘍？呢個遊戲，我以前都教過學生玩過！

E1: (positively) 係呀？ <to child:> [小朋友名字], 呢個係 __ 老師，都係教 __ 歲小朋友嘅。 <T smiles at child, goes to her work> 好，咁我哋而家開始玩啦。

Warm-up Trials

E1: 呢個遊戲係關於唔同嘅物件同埋佢哋嘅用途嘅。我會先教咗你玩，你學識之後，我會搵你幫手，用呢部機錄低你嘅答案，用嚟教低班嘅小朋友玩架！我們嚟學吓個遊戲啦！

[先嚟綠色制，然後揀答案]

- 金魚係生活喺樹上面定係生活喺水裡面嘍？（水裡面，唔）如此類推
- 鎖匙係用喺度門度定係用喺本書度嘍？
- 蠟燭係擺喺枕頭上面定係擺喺蛋糕上面嘍？

E1: 學得好快嗎！而家我哋再試一次頭先個關，但是今次我哋會用呢部機來錄低你嘅答案擺來俾低班嘅小朋友睇，教佢哋點樣玩，因為他們未識呀。我哋嚟試下啦。我話開始，就可以開始喇! (excited!) 準備好未？開始！

Core Trials

E1：唔！呢一關錄好喇！而家仲有4個回合，呢個回合關於 [A] 同 [B]，我要去擺一部新的機來錄呢關嘅答案，咁你係我返來之前練習一次先啦！__老師，*可唔可以幫我陪一陪*__呀？

T：無問題！噢，呢個回合我見過喇，你要將所有嘅 [A] 同 [A-MATCH] 配埋一齊，將所有嘅 [B] 同 [B-MATCH] 配埋一齊。<click>

- Standard: 呢 [A] 應該配乜野呀？ (請用量詞，如：粒/個/張)
- Standard: 呢 [B] 應該配乜野呀？
- Target: 呢 [A / B] 應該配乜野呀？

呢關練完喇！

E1：我返嚟喇！唔該晒__老師！（T：唔使客氣，我要出去另一間房做嘢喇，遲D再返嚟）好，輪到你幫手教低班嘅小朋友玩呢關喇。(excited!) 準備好未？開始！

Subsequent Trials

E1：又錄好一關喇！呢個新回合關於 [C] 同 [D]，我要去擺一部新嘅機嚟錄呢關嘅答案，你練習一次先啦！__老師，可唔可以再幫我睇住__呀？

T：可以！唔呢個回合，你要將所有嘅 [C] 同 [C-MATCH] 配埋一齊，所有嘅 [D] 同 [D-MATCH] 配埋一齊。<click>

- Standard: 呢個 [C] 應該配乜野呀？
- Standard: 呢個 [D] 應該配乜野呀？
- Target: 呢個 [C / D] 應該配乜野呀？

E1：唔該晒__老師！（T：唔使客氣，我要出去另一間房做嘢喇，遲D再返嚟）好，輪到你幫手教低班嘅小朋友玩呢關喇。準備好未？開始！

IV. Protocol in Cantonese Chinese for Hong Kong second graders (Study 2)

Session One

E1: 呢本書叫做“這是甚麼？”，裡面版版都有唔同嘅物件。如果你認得出，就要話俾我聽你見到D乜。有D物件可能係你未見過嘅，如果你未見過呢，就話俾我聽你唔知道，咁就得㗎喇。明唔明白呀？[呢個係乜嚟㗎？呢個用來做乜野㗎？係__定係__?]

E1: 好快啫！我揀其中嘅圖片嚟設計一個電腦遊戲，用嚟教幼稚園嘅小朋友認識唔同物件嘅用途。下次返嚟我想搵你幫手試一試個遊戲。

Session Two

E1: 記不記得呢本書呢？我揀咗其中嘅圖片嚟設計一個電腦遊戲，用來教幼稚園小朋友認識唔同物件嘅用途。今日我想搵你幫手試一試個遊戲。我會首先教咗你玩，然後錄低你玩遊戲嘅過程，用來示範俾幼稚園嘅小朋友睇㗎。

我們來學下個遊戲先啦！

首先有一個熱身回合。睇下呢個回合嘅指示先：你要將所有嘅花樽同花配埋一齊，將所有嘅杯同牛奶配埋一齊。記不記得呀？記得嘅話，就嚟一下呢隻公仔開始呢個回合。

呢個花樽配乜野呀？（揀好答案就嚟綠色制，然後嚟你嘅答案）牛奶。

呢個杯配乜野呀？

呢個杯配乜野呀？

E1：學得好快啫！而家我地再試一次頭先啲關，今次我會錄低你玩遊戲嘅答案，攞來教幼稚園小朋友玩嘅。當你將手放在藍色部份，就即係話俾我聽你準備好喇。一陣間我話開始，你就可以嚟一下隻公仔去開始去呢個回合架喇 (excited!) 準備...開始！

E1：好喇，我哋睇下錄成點咯。(reviews recording, and press CALL button) 唔錯啫！而家仲有4個回合，我會俾你練習一次先，然後再錄低你玩遊戲嘅答案既。

Introduction to the Teacher

[T enters]

T: 請問你而家方不方便呀？主任有事想問一問你 / 校務處有電話搵你呀。

E1: 哦，你係...

T: 我是今日來探訪學校嘅__老師。

E1: 咁好啦，我去搵主任/聽電話，麻煩老師可唔可以幫我陪同學練習一次這個遊戲呀？

T: 好，無問題。

E1: 唔該。我會盡快返嚟。呢份係遊戲嘅說明書。

Core Trials

T: 唔該。好，呢個回合，你要將所有的 [A] 同 [A-MATCH] 配埋一齊，將所有的 [B] 同 [B-MATCH] 配埋一齊。(記不記得？記得就嚟公仔開始)

- Standard: 呢 [A] 配乜野呀？ (請用量詞，如：粒/個/張)
- Standard: 呢 [B] 配乜野呀？
- Target: 呢 [A / B] 配乜野呀？

Repeat throughout the four rounds.

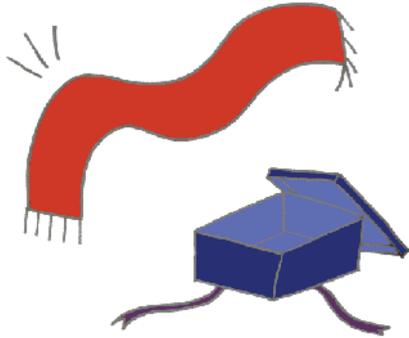
E1: 我返嚟喇! 唔該晒 __ 老師！ (T: 唔使客氣，咁我出返去做嘢喇)

好，而家我地玩番剛才幾個回合，今次我會錄低你嘅答案，擺嚟教幼稚園的小朋友玩嘅。當你將手放喺藍色部份，就即係話俾我聽你準備好喇。我話開始，你就可以嚟一下隻公仔去開始，然後玩晒四個回合喇。準備...開始！

Appendix C: Vignettes of Hypothetical Transgressions

- I. Breaching expectations in the conventional domain
- II. Breaching expectations in the labeling domain
- III. Breaching expectations in the procedural domain
- IV. Breaching expectations in the societal rule domain
- V. Breaching expectations in the moral domain

I. Breaching expectations in the conventional domain



One day, Aidan's teacher receives a gift. Look, it's a scarf!



Aidan's teacher puts the scarf around her waist.

English version

One day, Aidan's teacher receives a gift. Look, it's a scarf!

(a) Do you know how to put on a scarf?

Yes/Actually, you put it around your neck.

Aidan's teacher puts the scarf around her waist.

(b) Is Aidan's teacher right, or is she wrong?

(c) Should Aidan say that the teacher is wrong, or should he say nothing? Why?

(d) Why do you think Aidan's teacher put the scarf around her waist?

Chinese version

有一日，明明嘅老師收到一條頸巾做禮物。

(a) 你知唔知道頸巾係點樣戴呀？

係呀／其實，頸巾應該戴係頸度。

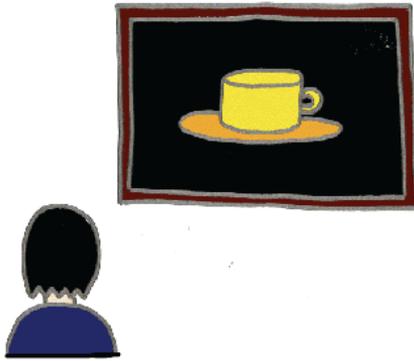
明明嘅老師 將頸巾戴喺條腰度。

(b) 老師 咁樣做，係啱定係錯呀？

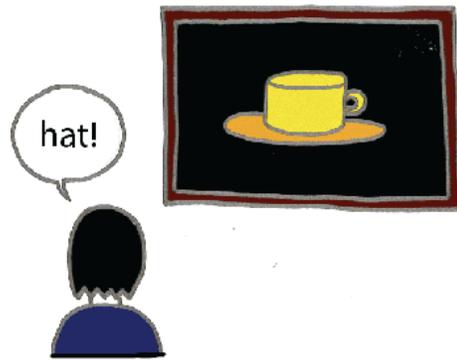
(c) 明明應該出聲同老師講吖，定係應該唔出聲呢？點解呀？

(d) 你覺得老師點解將頸巾戴喺條腰度既？

II. Breaching expectations in the labeling domain



One day, Aidan's teacher sees a picture at the museum.



Aidan's teacher says the picture is of a hat.

English version

One day, Aidan's teacher sees a painting at the museum.

(a) Do you know what's in the painting?

Yes/Actually, it's a painting of a cup.

Aidan's teacher says this is a painting of a hat.

(b) Is Aidan's teacher right, or is she wrong?

(c) Should Aidan say that the teacher is wrong, or should he say nothing? Why?

(d) Why do you think Aidan's teacher said it was a painting of a hat?

Chinese version

有一日，明明嘅老師喺博物館度見到一幅畫。

(a) 你知唔知道頸巾係點樣戴呀？

係呀／其實，呢幅畫畫既係一隻杯。

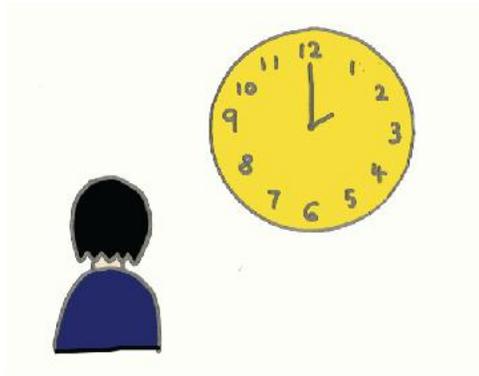
明明嘅老師話呢幅畫畫既係一頂帽。

(b) 老師 咁樣講， 係啱定係錯呀？

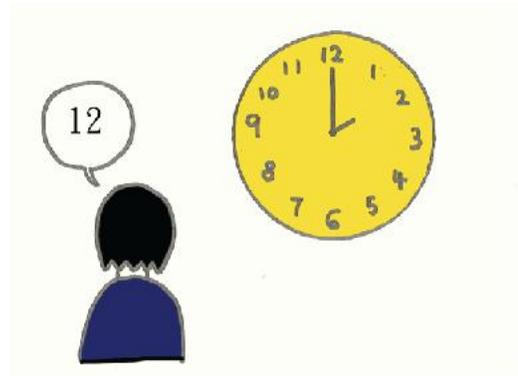
(c) 明明應該出聲同老師講吖， 定係應該唔出聲呢？ 點解呀？

(d) 你覺得老師點解話呢幅畫畫既係一頂帽既？

III. Breaching expectations in the procedural domain



One day, Aidan's teacher looks at the clock.



Aidan's teacher says it's twelve o'clock.

English version

One day, Aidan's teacher looks at the clock

(a) Do you know what time it is?

Yes/Actually, it's 2 o'clock.

Aidan's teacher says that it's 12 o'clock.

(b) Is Aidan's teacher right, or is she wrong?

(c) Should Aidan say that the teacher is wrong, or should he say nothing? Why?

(d) Why do you think Aidan's teacher said it was 12 o'clock?

Chinese version

有一日,明明既老師喺課室度睇鐘。

(a) 你知唔知道個鐘而家顯示緊幾點呀?

係呀／其實，係兩點。

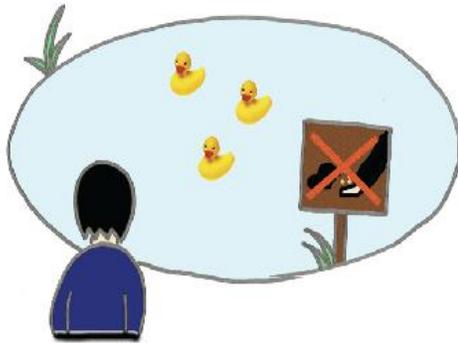
明明嘅老師話係十二點。

(b) 老師咁樣講，係啱定係錯呀？

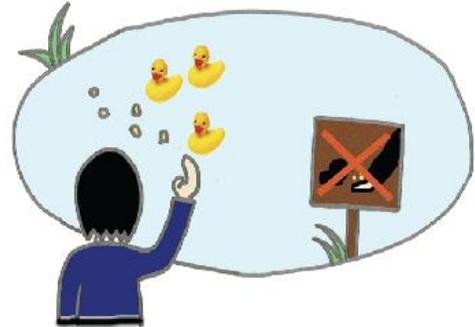
(c) 明明應該出聲同老師講吖，定係應該唔出聲呢？點解呀？

(d) 你覺得老師點解話係十二點既？

IV. Breaching expectations in the societal rule domain



One day, Aidan's teacher sees many ducks in a pond. Next to the pond is a sign.



Aidan's teacher goes on feeding the ducks.

English version

One day, Aidan's teacher sees many ducks in a pond. Next to the pond is a sign.

(a) Do you know what this sign means?

Yes/Actually, the sign says "no feeding".

Aidan's teacher goes on feeding the ducks.

(b) Is Aidan's teacher right, or is she wrong?

(c) Should Aidan say that the teacher is wrong, or should he say nothing? Why?

(d) Why do you think Aidan's teacher went on feeding the ducks?

Chinese version

有一日，明明嘅老師喺池塘邊見到好多鴨仔。隔離有個牌。

(a) 你知唔知道呢個牌咩意思呀？

係呀／其實，個牌既意思係不准餵鴨仔食野。

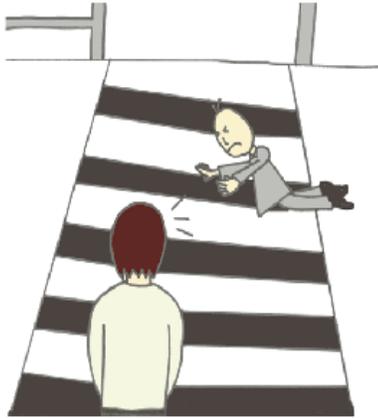
明明嘅老師繼續餵鴨仔食野。

(b) 老師 咁樣做， 係啱定係錯呀？

(c) 明明應該出聲同老師講吖，定係應該唔出聲呢？點解呀？

(d) 你覺得老師點解繼續餵鴨仔食野既？

V. Breaching expectations in the moral domain



One day, Aidan's teacher is crossing the street when an old man falls down next to her.



Aidan's teacher goes on her way, and does not help the old man.

English version

One day, Aidan's teacher is crossing the street when an old man falls down next to her.

(a) Do you know what to do when this happens?

Yes/Actually, you should stop and help.

Aidan's teacher goes on her way, and does not help the old man.

(b) Is Aidan's teacher right, or is she wrong?

(c) Should Aidan say that the teacher is wrong, or should he say nothing? Why?

(d) Why do you think Aidan's teacher didn't help the old man?

Chinese version

有一日，明明嘅老師過緊馬路嘅時候，身邊個*老伯伯*跌親呀。

(a) 你知唔知道呢個時候要點樣做呀？

係呀／其實，應該停落來幫個老伯伯。

明明嘅老師繼續過馬路，無幫到個老伯伯。

(b) 老師咁樣做，係啱定係錯呀？

(c) 明明應該出聲同老師講吖，定係應該唔出聲呢？點解呀？

(d) 你覺得老師點解無幫到個老伯伯既？

Appendix D: Items in Parental Questionnaire (English)

Scale	Questions
<p>Authoritative Parenting</p> <p>(9 items)</p>	<p>1. Children's expressions of emotions must be encouraged and assisted.</p> <p>6. Parents should seek opportunities to praise children.</p> <p>8. My child's feelings and ideas deserve respect even when they are in conflict with my own.</p> <p>13. My child has his/her own ideas that should be listened to with respect. (17. I treat my child like an equal.)</p> <p>18. Children should be given help in understanding feelings.</p> <p>22. Children should be encouraged to express their opinions or feelings. (26R. Parents don't need to provide reasons for their requests to children.)</p> <p>30. Parents who spend more time playing and doing things with their children have children who are more willing to listen to their parents.</p>
<p>Filial Piety</p> <p>(9 items)</p>	<p>2. It is important for my child to achieve academic success.</p> <p>5. I want my child to respect our family's honor.</p> <p>7. I want my child to strive to impress his/her teachers.</p> <p>9. It is important for my child to behave well for the sake of our family's reputation.</p> <p>12. I want my child to be obedient.</p> <p>15. I want my child to follow instructions without asking questions.</p> <p>16. I want my child to be highly respected.</p> <p>20. I want my child to make me proud of him/her.</p> <p>28. It is important for my child to listen to his/her elders.</p>
<p>Modesty</p> <p>(4 items)</p>	<p>11. I _____ discourage my child from strongly expressing her point of view around others.</p> <p>14. I _____ discourage my child from acknowledging compliments from friends or adults.</p> <p>23. I _____ discourage my child from appearing confident to others about his or her own abilities.</p> <p>31. I _____ discourage my child from showing off his/her knowledge or skills to get attention.</p>
<p>Training</p> <p>(8 items)</p>	<p>3. Keeping close watch on your child's activities lets him/her know you care about them.</p> <p>4. When my child transgresses it is necessary to have him/her confess and repent.</p> <p>19. Parents should sacrifice for their children's educational benefit.</p> <p>21. Parents must begin training their children as early as possible.</p> <p>24. For my child's own good, it is sometimes necessary to discipline my child harshly.</p> <p>25. When a young child misbehaves in public, parents should correct him/her immediately even in front of other people.</p> <p>27. Children should be often reminded of the rules of appropriate conduct.</p> <p>29. In order for a child to learn, parents should continually monitor and correct a child's behavior.</p>

Appendix E: Items in Parental Questionnaire (Chinese)

Scale	Questions
Authoritative Parenting (9 items)	1. 我們必須鼓勵和協助孩子表達他們的情緒。 6. 家長要尋找讚賞孩子的機會。 8. 縱使我的孩子的感受和意見跟我的想法有衝突，仍然是值得尊重的。 13. 我的孩子有屬於自己的想法，值得我聽取尊重。 (17. 我對待我的孩子如同對待平輩一樣。) 18. 我們要協助孩子培養他們對情感的了解。 22. 我們應該鼓勵孩子表達自己的意見和感受。 (26R. 家長對孩子提出要求時，不需要解釋背後的理由。) 30. .多花時間跟孩子玩耍和做事，孩子會更願意聽家長的話。
Filial Piety (9 items)	2. 我覺得 我的孩子在學業上取得成就 是重要的。 5. 我希望我的孩子尊重我們一家的聲譽。 7. 我希望我的孩子能夠盡力給老師留下深刻良好的印象。 9. 為了我們一家的聲譽，我的孩子有良好行為是很重要的。 12. 我希望我的孩子聽話。 15. 我希望我的孩子能夠毫不質疑地服從指示。 16. 我希望我的孩子備受尊重。 20. 我希望我的孩子讓我為他/她感到驕傲。 28. 我覺得 孩子聽長輩的話 是重要的。
Modesty (4 items)	11. 我的孩子在別人面前強烈地表達自己的意見時，我 ____ 勸阻。 14. 我 ____ 勸阻我的孩子接受朋友或成年人的恭維和讚賞。 23. 當我的孩子在別人面前為自己的才能顯得十分自信時，我 ____ 勸阻。 31. 當我的孩子為了引起別人的注意而炫耀自己的知識或技能時，我 ____ 勸阻。
Training (8 items)	3. 密切關注孩子的活動會讓孩子知道你關心他們。 4. 我的孩子犯錯後，必須認錯和改過。 19. 做家長的應該為孩子在學業上的益處而作出犧牲。 21. 家長必須儘早開始訓練自己的孩子。 24. 為了我的孩子的好處，嚴厲的管教有時是需要的。 25. 當一個四、五歲的小孩在公眾場合做出不對的行為，即使有其他人 在場，家長也應該立即糾正孩子的行為。 27. 我們要經常提醒孩子其應有的行為和規矩。 29. 為了讓孩子學習，家長應不斷監察和糾正孩子的行為。

Appendix F: Transgression Perception Questions for Parents

After viewing pictures identical to the one shown to children (Appendix C), parents answered the following questions in fixed order.

English Version:

Your child's teacher made a mistake.

1) How serious is it for a TEACHER to be wrong in THIS case? _____

*Please rate from 0 (Not Serious) to 10 (Very Serious)

2) In this situation, do you want your child to tell the teacher that she is wrong? Yes/No

3) Out of 100 other parents in the US filling out this survey, estimate how many would want their children, in this situation, to tell the teacher that s/he is wrong: _____ parents

4) Explain WHY you do/don't want your child to tell the teacher that she is wrong.

Chinese Version:

您孩子的老師做錯了。

一) 一個老師在這個情況下犯錯，有多嚴重？ _____

(0 = 不嚴重， 10 = 十分嚴重)

二) 在這個情況下，您希望您的孩子告訴老師他錯了嗎？ 希望/不希望

三) 在100位填寫這份問卷的其他香港家長中，請估計有多少位家長會希望自己的孩子 在這個情況下 告訴老師他錯了： _____ 位家長

四) 請解釋為什麼你希望/不希望你的孩子 告訴老師他錯了。

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