WILEY
InterScience®
DISCOVER SOMETHING GREAT

Seeing is believing: How participants in different subcultures judge people's credulity

PETER MITCHELL, MARIANNA SOUGLIDOU,
LAURA MILLS AND FENJA ZIEGLER*
*School of Psychology, University of Nottingham,
University Park, Nottingham, UK*

Abstract

We presented a scenario in which a protagonist saw an object in Location A but later heard a message saying it was in Location B. Participants judged where the protagonist believed the object was. In one condition, participants had additional information that the message was true. Those from an individualistic subculture tended to judge that the protagonist believed the message when they (the participants) knew it was true but disbelieved the message when they had no additional information. In contrast, participants from a collectivist subculture tended to judge that the protagonist believed the message in both circumstances. The results suggest that culture is related with subtle aspects of understanding the mind and especially how people evaluate messages. Copyright © 2006 John Wiley & Sons, Ltd.

Being able to connect with other people via language allows transmission of a wealth of information, from fine details of fact to the accumulated wisdom of a culture. An understanding of the mind, coupled with linguistic faculty, means that we do not always have to rely on arduous and time-consuming first hand experience in order to learn about the world. However, there is a draw back in that information passed on from other people has a special status. Reported information might be distorted or downright misleading if the communicator holds an incorrect conception, deliberately tells lies, or speaks in an impenetrable hyperbolic or rhetorical style. Therefore, reported information has to be assigned a special status, and one sign that people do this, all things being equal, is that they believe what they see in preference to what they are told, when the two sources of information stand in conflict. This is something people do from an early point in development—maybe from the age of about 3 or 4 years (e.g., Robinson, Mitchell, & Nye, 1995).

Effectively, treating direct observation as more trustworthy than verbal report reveals tacit or implicit understanding that information originating from another mind has a different status than information gained from direct observation. In other words, the evidence suggests that from an early age, children have at least some implicit understanding about the mind—an understanding that

*Correspondence to: Fenja Ziegler, School of Psychology, University of Nottingham, University Park, Nottingham NG7 2RD, UK. E-mail: Fenja.Ziegler@nottingham.ac.uk

potentially helps them to build the most reliable knowledge base from available information. A form of explicit understanding is also demonstrable at a similarly early point in development, where children judge that another person will believe what they see in preference to what they are told (Mitchell, Robinson, Isaacs, & Nye, 1996; Perner & Davies, 1991). In the cited studies, a protagonist put sweets in Location A and then left the scene. Subsequently, another person told the protagonist that the sweets were in Location B. Observing participants aged 4 years were then asked to judge where the protagonist thought the sweets were, and they tended to say 'Location A,' irrespective of what they (the participants) knew about the sweets' actual location. In short, they judged that people believe what they see in preference to what they are told, irrespective of the actual state of reality.

Whilst children's judgments seem to reveal an understanding of the special status of reported information, coupled with an understanding of the mind—that information from minds should be treated differently than directly acquired information—further investigations exposed a limitation in their understanding. A study by Mitchell et al. (1996) compared children aged 6 and 8 years of age with adults and revealed that while the children judged similarly to those in the other cited studies, the adults judged in a strikingly different way. While the children predictably judged that the protagonist would believe what he saw in preference to what he was told (irrespective of what the participants knew of the true state), the adults tended to judge that the protagonist would believe the message if they (the participants) knew it was true! For example, adults judged that the protagonist would believe the sweets were in A, where he last saw them, when they had no additional information about the true location. In this condition, the adults were indistinguishable from the children. But when the adults had privileged information that the sweets were in Location B (as indicated by the message), then they tended to judge that the protagonist would believe the message. They judged in this way despite the fact that it was made abundantly clear that the protagonist had no additional information about the veracity of the message. In short, the adults were behaving as if a message they knew to be true would be inherently more believable to another person who had no additional information about its status. Children, in contrast, did not behave in this way.

Although the adults effectively confused their own knowledge with the protagonist's, while children did not, there is still a sense in which the children's understanding was limited. Namely, the children seemed to think without exception that people believe what they see in preference to what they are told when the two are in conflict. The adults, in contrast, seemed to think there might be exceptions, but interestingly the particular exception in this case was when the message was true. When the message was not known to be true, they effectively judged that the protagonist would disbelieve it, which seemed to be a default judgment when the participants had no additional information about the message's veracity.

On the face of things, it seems puzzling that adults should suppose by default that people give higher weighting to direct observation over reported information in the scenarios used by Mitchell et al. (1996)—even if the adults were not as radical as the children who attributed skepticism right across the board. In those scenarios, the reported information was received some time after the direct observation, and it is conceivable that reality had changed over time to accord with the reported information. Hence, it seems the adults in Mitchell et al. were disposed to think that people are basically skeptical even in a circumstance where it might be inappropriate. This is a surprising possibility given that when processing reported information (as opposed to passing judgment on how people receive the information), adults are notoriously gullible (Gilbert, 1991). It therefore seems worth enquiring whether the adult tendency to attribute skepticism in Mitchell et al.'s study is a widespread phenomenon or whether it is peculiar to a part of humanity.

Mitchell et al. (1996) did not record demographic details of their participants, though a proportion either attended or aspired to attend a major university in the UK. It is therefore possible that many were well-educated individuals reared in nuclear families, perhaps situated in rather individualistic

communities. That kind of upbringing might naturally foster a questioning and skeptical attitude (Nisbett, 2003), along with a feeling that people tend to be mistrusting.

Considering the evidence for cross-cultural differences in theory of mind development and performance (Greenfield, Keller, Fuligni, & Maynard, 2003), perhaps individuals reared in a different kind of community, that values a collectivist or interdependent (Markus & Kitayama, 1991) spirit, would exhibit an attitude of credulity. Perhaps such individuals would think that people are basically trusting and thus judge that a protagonist would believe what he was told in the scenario used by Mitchell et al., even if they (the participants) did not know that the message was true. If so, this finding would have far-reaching implications, for it would raise the possibility that at least one aspect of people's working understanding of the mind is relative to the culture in which they are reared. The possibility that culture as a 'socially interactive process of construction' (Greenfield et al., 2003, p. 462) can influence cognition has been raised by Markus and Kitayama (1991) who suggested that '[. . .] a consideration of the social context and the reactions of others may also shape some basic, nonsocial cognitive activities such as categorizing and counterfactual thinking (p. 231).' Indeed, Nisbett (2003) reviews a large body of evidence which highlights differences in reasoning across independent (individualistic) and interdependent (collectivistic) cultures. Counterfactual reasoning in particular is a process that is associated with making judgments about other people's mental states (Riggs, Peterson, Robinson, & Mitchell, 1998) and we might therefore consider that culture can influence the understanding of other minds.

We might thus expect participants to judge differently in Mitchell et al.'s (1996) task depending on whether they have an independent mode of thinking or an interdependent mode, as these terms are defined by Nisbett (2003). The independent mode is associated with Western industrialized culture, typical in large modern cities. Traditionally the term 'individualistic' (or *independent* in Nisbett's terminology) refers to behavior in which the guiding principle is the interest of the individual. People from individualistic cultures place more importance on asserting their individuality. Child rearing patterns in individualistic cultures tend to emphasize independence and self-reliance (Triandis, 1989).

In contrast, people in collectivist cultures (*interdependent* in Nisbett's terminology) are more concerned with their group membership, and are more socially orientated. Hsu (1985) defined collectivism as being more concerned with others, sharing material resources, and being attuned to the implications for others of their decisions. Throughout this paper, the terms interdependent and collectivist and independent and individualistic are used as synonyms.

Collectivism is associated with child rearing patterns that emphasize reliability, conformity, and the importance of the collective (Triandis, 1989). For example, at an early age, group unity is already a valuable goal that Chinese children have acquired through socialization. Singh, Huang, and Thompson (1962) illustrated the concept of individualism–collectivism through the comparison of the values held by Americans and Chinese. Chinese ranked highest on society-centered orientation, whereas Americans ranked highest in self-centered orientation. Triandis (1989) described the concept of Individualism–Collectivism as the most important dimension of cultural differences in social behavior across the diverse cultures of the world. Previous research also acknowledges regional variation within cultures (Kashima et al., 2004), where urban samples are often referred to as individualistic while rural samples tend to be collectivistic (e.g., Doumanis, 1983).

In summary, Nisbett (2003) persuasively argues for differences between people reared in cultures that foster either an independent or interdependent mode of thinking: This is apparent in problem solving and in logical reasoning. A purpose of the present study is to investigate whether participants who we might suppose differ in these two modes of functioning perform differently also in psychological reasoning. In particular, we might expect to find that participants perform differently on Mitchell et al.'s (1996) task. Recall that while participants judged that Kevin would believe what he was told when they (the participants but not Kevin) knew the utterance was true, they judged that he would

disbelieve what he was told when they (the participants) had no additional information about the truth of the utterance. In the latter case, participants were effectively judging that Kevin would have a skeptical attitude toward an utterance that conflicted with information he had gained directly from seeing. Presumably, then, these participants assumed that people are mistrusting or at least doubtful of the value of others' communications. This assumption of interpersonal skepticism is typical of people who function in the independent mode, according to Nisbett (2003).

Perhaps it is not surprising, therefore, that the participants in Mitchell et al. (1996) were recruited in a large industrialized city. If the participants had been recruited from a rural community, then an assumption of interpersonal trust might have prevailed. This might have been manifest as a tendency to judge that Kevin would believe what he was told even though the message conflicted with what he saw and even when there was no additional information indicating that the utterance was true. The purpose of the current study was to test this possibility by including participants whom we might suppose function according to an interdependent mode.

EXPERIMENT 1

We began by recruiting participants from Cyprus and the UK. The critical comparison was between participants who were city dwellers (from Nicosia, the capital of Cyprus) and those who lived in a small rural village (Agros, in Cyprus). We expected to replicate the findings of the previous research (Mitchell et al., 1996) in the new UK sample and in the sample from Nicosia. In other words, we expected participants to judge that a protagonist would believe a message when they (the participants) knew it was true, and critically, we expected them to judge that a protagonist would disbelieve the message when they (the participants) had no additional information. Such a finding would indicate that participants assume people are basically skeptical. We expected a different pattern of results from participants who lived in Agros, a small rural village. We expected these participants to judge that the protagonist would believe the message irrespective of whether or not they (the participants) had additional information that the message was true. In other words, we expected the village participants to assume that people are basically credulous.

Method

Subjects

We recruited a total of 90 participants aged 17–20 years, consisting of 43 females and 47 males. Thirty participants were first-year undergraduate students at the University of Nottingham, none of whom studied psychology and were unlikely to know of relevant previous research. The mean age was 18 years and 6 months. Thirty were recruited from Nicosia, which is the capital of Cyprus with a population of 276 000. The mean age of the participants was 19 years. The remaining 30 were from Agros, with a mean age of 18 years and 6 months. The government Census of 2001 found 237 households in Agros, inhabited by 837 people. This traditional community was sustained by agriculture, where families tended to be large and extended. The village is located in a mountainous region in the center of the island and is quite distant from the main highway that traverses north to south. The two Cypriot samples were attending the final year of high school. The Cypriot ministry of education granted permission for testing to take place in the Dhassoupolis public Lyceum (Nicosia) and in the Agros public Lyceum. All participants gave informed consent and were fully debriefed at the end of the experimental session.

Materials

In order to examine whether participants at the three different sites had a similar level of basic ability, we presented a short test, consisting of 10 items. Five required participants to add a number to a sequence that logically followed. A further five were based on Raven's progressive matrices.

All participants read two stories, each illustrated with three or four pictures and each printed on a sheet of A4 paper, either in English or translated into Greek. One was based on Mitchell et al. (1996) and the other was the football story adapted from Perner and Davies (1991). The two stories had similar content and could either be in the condition of 'no additional information' or 'true message.' The following is the example from Mitchell et al., based on the 'true message' condition, composed of four pictures with a caption under each:

Mary and John returned to the kitchen after buying a pack of sweets. They put the pack of sweets in the white drawer and then they both left the kitchen (Picture 1). After a while, Mary returned to the kitchen to have some sweets and then put the pack of sweets in the black drawer (Picture 2). An hour later, Mary left to go to a friend's house, and told John that the sweets were in the black drawer (Picture 3). John returned to the kitchen to eat some sweets (Picture 4).

Question: 'Where does John think the sweets are?'

In the 'no additional information' version, Picture 2 and the accompanying text were removed, saying that Mary moved the sweets from the white to the black drawer. Hence, participants had no additional information indicating whether Mary's message about the sweets being in the black drawer was true or false. Otherwise, the story and question were identical.

Design & Procedure

Participants were tested in a quiet room in groups of five, separated to prevent seeing each others' responses. They began with the ability test and were allowed 10 minutes for completion. They then proceeded to the stories, which were presented in counterbalanced order with half the participants beginning with the 'sweets' story and the rest beginning with the 'football' story. One story was presented in the 'no additional information' condition and the other was presented in the 'true message' condition. The counterbalancing of experimental conditions was factorially combined with the counterbalancing of the story themes. Therefore, half the participants began with 'no additional information' while the rest began with 'true message' and this was achieved without confounding experimental condition with story theme. There was no time limit on this part of the procedure, though all participants had completed the task within 5 minutes.

Results

The mean scores (and standard deviation) out of 10 on the ability test were 6.3 (2.2), 7.2 (1.9), and 7.0 (1.5) for the samples from Agros, Nicosia, and Nottingham, respectively. A one-way analysis of variance was unable to detect a significant difference between the samples: $F(2, 87) = 2.87$, $p = 0.6$. Participants' tendency to judge that the listener would believe the message in the condition without additional information (the condition in which groups differed in their judgments—see below) was not related with performance on the ability test, as demonstrated by a point biserial correlation: $r_{pb}(88) = 0.1$, $p = 0.34$.

We conducted a series of McNemar and contingency χ^2 analyses to investigate the effect of incidental factors. Participants did not generally judge that the listener would believe the message more frequently in one story theme than in the other. Similarly, there was no general tendency (McNemar χ^2)

Table 1. The number (and percentage) of participants who judged that the listener believed the message

	No additional information	True message
Agros (Village) ($n = 30$)	23 (77%)	24 (80%)
Nicosia (City) ($n = 30$)	6 (20%)	27 (90%)
Nottingham (City) ($n = 30$)	8 (27%)	29 (97%)

for participants to judge that the listener would believe the message in the story presented first than in the story presented second, or the opposite. The general pattern of judgments made by male participants did not differ from that of female participants (χ^2 contingency).

Table 1 shows the number and percentage of participants judging effectively that the recipient of the message believed it (e.g., that John believed the sweets were in the black drawer, as Mary said). The table depicts a very clear pattern of data, which is that participants from the two cities were strongly inclined to judge that the listener would believe the message when they (the participants) knew it was true, but judge that the listener would disbelieve the message when they (the participants) had no additional information. In sharp contrast, participants from the village tended to judge that the listener would believe the message in both cases. This impression is supported by a variety of statistical analyses, reported below.

We examined differences between the three groups of participants specifically in the condition with no additional information: $\chi^2(2, n = 90) = 23.79$, $p < 0.001$. Participants in the village Agros were significantly more likely to judge that the listener believed the utterance than those in Nicosia [$\chi^2(1, n = 60$, corrected for continuity$) = 17.09$, $p < 0.001$] and Nottingham [$\chi^2(1, n = 60$, corrected for continuity$) = 13.08$, $p < 0.001$]. An analogous analysis based on the 'true message' condition failed to identify a significant contrast in judgments between groups.

We proceeded to investigate group-based preferences to judge either that the listener would believe or disbelieve the message. In the condition with no additional information, a significant majority from the village Agros judged that the listener believed the message: $\chi^2(1, n = 30$, corrected for continuity$) = 7.50$, $p < 0.01$. In Nicosia and Nottingham, in contrast, significant majorities judged that the listener did not believe the message [$\chi^2(1, n = 30$, corrected for continuity$) = 9.63$, $p < 0.001$ and $\chi^2(1, n = 30$, corrected for continuity$) = 5.63$, $p < 0.05$, respectively]. In the 'true message' condition, however, a significant majority judged that the listener believed the message in all groups ($p < 0.01$ in all three analyses, using χ^2).

Next, we compared judgments made by participants of each subculture across the conditions. In Nicosia, 22 participants judged that the listener believed the message when they (the participants) knew it was true and that the listener disbelieved the message when they (the participants) had no additional information. Only one participant judged in the opposite pattern: McNemar sign test, $(1, n = 23$, corrected for continuity$) = 17.39$, $p < 0.001$. In Nottingham, the pattern was 21 against zero: McNemar sign test, $(1, n = 22$, corrected for continuity$) = 19.05$, $p < 0.001$. The pattern in the village Agros was 4 against 3 participants, and was patently non-significant, which contrasts with the large differences found between conditions in participants from Nicosia and Nottingham.

Discussion

In two of the three samples, the results replicate those reported by Mitchell et al. (1996). They show that a sample of adults from the UK and from Nicosia, the capital of Cyprus, tend to judge that a listener will disbelieve a message that conflicts with direct observation when the participant has no additional

information, but that the listener will believe the message when they (the participants) know it is true. In contrast, participants from the village Agros tended to judge that the listener believed the message in both conditions.

Although we had hypothesized differences between samples in whether the listener would believe the message, perhaps the differences we observed were incidental to differences in basic ability of the sample populations. However, the test of ability failed to detect any such population differences.

Contrasts in judgments, then, between participants from Nicosia and from the village Agros, might reflect differences in subcultures within a nation, relating to collectivism and individualism. Moreover, it is notable that a minority of the sample from Nottingham judged in the condition without additional information that the listener would believe the message. Perhaps this minority belonged to a British subculture that held collectivist values. Interestingly, no differences emerged between the participants from urban areas in the UK and Cyprus, demonstrating that in this instance, the differences within cultures are stronger than those between nations.

EXPERIMENT 2

One aim of Experiment 2 was to investigate whether the contrast between Nicosia and Agros could be replicated in a sample from the UK. This time, however, we selected samples differently. Instead of selecting participants according to their geographical region, we asked if they had been brought up in a collectivist or individualistic community. Would those who said that they belonged to a collectivistic community judge in a pattern similar to participants from Agros who participated in the first study? Conversely, would those who said they belonged to an individualistic community judge in a pattern similar to participants from Nicosia in the first study? If so, then we would have gained direct evidence linking the pattern of judgments to individualism–collectivism to supplement the indirect evidence based on geography of upbringing.

We sought to shed further light on the relation between judgments and sub-cultural background by presenting Rotter's Trust Scale (Rotenberg, 1990; Rotter, 1967). Perhaps those from an individualistic community judge that the listener will disbelieve the utterance in the condition without additional information because their general cynicism fosters a supposition that people are basically mistrusting. If so, then they would gain a low score on the Trust Scale.

We also took the opportunity to modify the question at the end of the stories to allow participants to express a judgment on the strength of the listener's belief instead of asking them to make an absolute judgment. The listener might think that the sweets are probably in the white cupboard and probably not in the black cupboard, and we asked a modified question in Experiment 2 as appropriate.

Method

Subjects

One hundred participants were recruited from the University of Nottingham. They filled in a form stating their age, gender, and whether they considered themselves to have been brought up in an, (A) Close knit, collectivist community or (B) Impersonal, individualistic community. The data from the first 50 falling into each category were entered into the analyses. Participants were also asked about their subject area and any who studied psychology were excluded, in case they had become privy to psychological theories that posit differences in functioning depending on one's background. By

coincidence, half the participants were male and half were female. The mean age was 21 years and the range was 19 to 24 years. All participants gave informed consent and were fully debriefed at the end of the experimental session.

Materials

We used two stories that were each printed on a sheet of A4, consisting of four pictures and their captions. One was based on Perner and Davies's (1991) football story and the other was a new story shown below in the 'true message' condition: Anna and John return to the sitting room after buying a book (Picture 1). They place the book in the white drawer and then both leave the room (Picture 2). Anna returns to the sitting room to read the book and afterwards puts it in the black drawer (Picture 3). An hour later, Anna leaves the house and tells Tom the book is in the black drawer (Picture 4). In the condition with no additional information, participants were presented with exactly the same story but did not see Picture 3 and its caption. That is, they did not see Anna moving the book to the black drawer. The following questions developed from Fischhoff (1975) were printed beneath the story:

Please give your opinion:

(a) What does Tom think is the probability that the book is in the white drawer? _____%
(b) What does Tom think is the probability that the book is in the black drawer? _____%

Half of the participants were presented with the white drawer question first and the other half with the black drawer question first.

Additionally, we presented Rotenberg's (1990) 40-item revised questionnaire designed to measure interpersonal trust, adapted from Rotter (1967), which had the title 'General Opinion Survey.' This revised scale is shorter than the original and the wording is more simple, whilst still being a reliable measure of trust (see Rotenberg, 1990, for an analysis). Trust was measured on a 1–5 Likert scale, with 1 being 'strongly agree' and 5 being 'strongly disagree.' The scale was additive in which a high score indicates generally high trust. Twenty-five of the items measured trust and the remaining 15 were fillers. Twelve of the trust items were written so that an 'agree' response indicated trust and 13 were written so that a 'disagree' response indicated trust. The filler items were intended to disguise the purpose of the scale.

Design & Procedure

The design and procedure for the stories were the same as in Experiment 1, except that participants were tested individually in a quiet environment. Following this, participants were allowed a maximum of 10 minutes for filling in the questionnaire. They were asked to complete the questionnaire as accurately and honestly as possible, to read each item carefully and to register their opinions by making the appropriate number next to the item: 1-strongly agree, 2-mildly agree, 3-agree and disagree equally, 4-mildly disagree, 5-strongly disagree.

Results & Discussion

Reassuringly, participants' ratings that the listener probably believed the message were the inverse of their rating that the listener probably disbelieved the message. To be consistent with Experiment 1, therefore, we confined analyses to rating that the listener probably believed the message. The means

Table 2. Mean percentage ratings (and standard deviation) of credulity and trust scores

	No additional information	True message	Trust score
Collectivist ($n = 50$)	74% (31)	89% (18)	72 (8)
Individualistic ($n = 5$)	42% (31)	81% (20)	67 (7)

displayed in Table 2 form a pattern that is distinctly similar to that in Table 1. Namely, participants who reported belonging to a collectivist subculture tended to judge that the listener probably believed the message, irrespective of whether they (the participants) had additional information that the message was true. In contrast, those who reported belonging to an individualistic subculture tended to judge that the listener probably believed the message only when they (the participants) knew the message was true.

We began analyzing participants' ratings that the listener probably believed the message by investigating the effects associated with gender, story order, and ordering of experimental conditions, but none of these was significant. A focal analysis of variance incorporated a between-groups factor of two levels, classifying the participants' subculture, plus a within-subjects factor that classified whether or not the story contained additional information that the message was true. There was a main effect associated with subculture, where participants from the collectivist community assigned a higher probability to indicate that the listener believed the message: $F(1,98) = 22.32$, $p < 0.001$, $\eta_p^2 = 0.19$). There was also a main effect associated with the experimental manipulation, and participants assigned a higher probability to indicate that the listener believed the message when they (the participants) knew it was true: $F(1,98) = 90.98$, $p < 0.001$, $\eta_p^2 = 0.49$. Importantly, there was also a significant interaction: $F(1,98) = 17.53$, $p < 0.01$, $\eta_p^2 = 0.15$ (see Figure 1).

We performed an analysis of simple effects to help interpret the interaction. In the condition without additional information, participants from the collectivist subculture assigned a higher probability to indicate that the listener believed the message than those from the individualistic subculture, both in the condition without additional information [$F(1,99) = 27.23$, $p < 0.001$, $\eta^2 = 0.22$] and in the condition with additional information [$F(1,99) = 4.63$, $p < 0.05$, $\eta^2 = 0.05$]. We then proceeded to examine the effect of experimental condition in the two subcultures independently. In both the individualistic [$F(1,49) = 84.90$, $p < 0.001$, $\eta_p^2 = 0.63$] and the collectivist participants [$F(1,49) = 16.08$, $p < 0.001$,
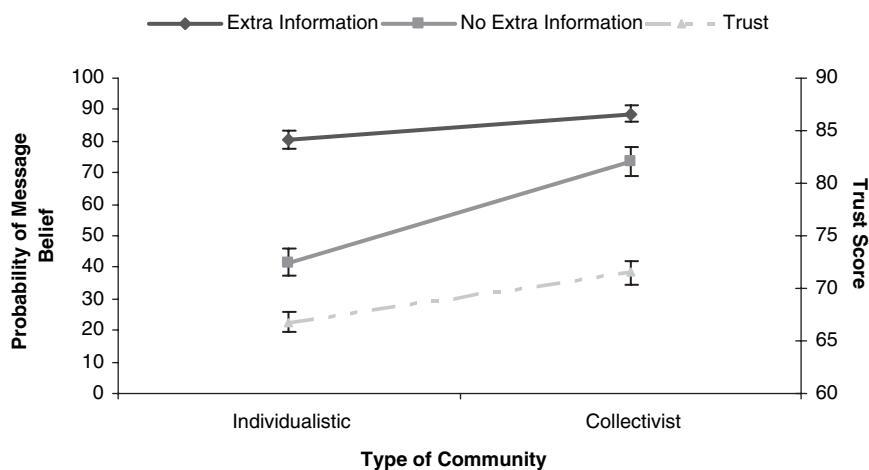

Figure 1. Mean credulity ratings and trust scores by type of subculture and experimental condition

$\eta_{p}^2 = 0.25$], there was a tendency to assign a higher probability to indicate that the listener believed the message when they (the participants) knew it was true. Although the effect was present in both groups, it appeared to be larger in those who said they were from an individualistic community.

Using one-sample *t*-tests, we investigated participants' preferences to rate the listener as probably believing the message. When the participants knew the message was true, their mean ratings were significantly above 50%, and that held for participants who said they belonged to an individualistic subculture [$t(49) = 10.73$, $p < 0.001$] as well as those who said they belonged to a collectivist subculture [$t(49) = 14.94$, $p < 0.001$]. Importantly, those who said they belonged to a collectivist subculture also had a mean rating above 50% even in the condition without additional information: $t(49) = 5.40$, $p < 0.001$. In contrast, those who said they belonged to an individualistic subculture had a mean rating *below* 50% when they had no additional information about the veracity of the message: $t(49) = 1.96$, $p = 0.05$.

Responses on the Trust Questionnaire

A priority was to investigate whether participants who said that they belonged to a collectivist subculture had higher ratings of trust than participants who said they belonged to individualistic subcultures. We conducted an analysis of variance incorporating two between groups factors, each with two levels: subculture and gender. A main effect associated with subculture confirmed that participants from collectivist communities had higher ratings of trust than those from individualistic communities: $F(1,96)$; 10.71, $p < 0.001$, $\eta_{p}^2 = 0.10$. Additionally, males had higher ratings of trust than females: $F(1,96)$; 9.14, $p < 0.05$, $\eta_{p}^2 = 0.09$. There was no significant interaction between the two factors. The effect associated with gender was unexpected and we raise this as a phenomenon to be explained in future research.

Trust as a Mediator

We proceeded to conduct a mediation analysis in order to investigate whether trust can account for the relation between participants' community and their ratings that the listeners would probably believe the message in the condition without additional information. Three simple linear regression analyses confirmed the following: (1) community is a highly significant predictor of trust scores ($\beta = -0.30$, $p = 0.002$), accounting for 9% of the variance in trust scores; (2) community was a highly significant predictor of credulity ratings ($\beta = -0.47$, $p = 0.001$), accounting for 21.7% of the variance in credulity judgments; and (3) trust was a highly significant predictor of credulity ratings ($\beta = 0.34$, $p = 0.001$), accounting for 10% of the variance in credulity ratings. When community and trust scores were analyzed in a multiple regression as predictors of credulity ratings, both community ($\beta = -0.40$, $p = 0.001$) and trust ($\beta = -0.21$, $p = 0.02$) were significant predictors of the credulity ratings, accounting for 26% of the variance in credulity ratings. To establish whether the trust scores mediate the effect of the community type on the credulity ratings, a Sobel test was conducted which approached significance ($z = -1.8$, $p = 0.06$).

GENERAL DISCUSSION

In these studies, young adults across different cultures and subcultures were united in tending to judge that a listener (probably) believed a message when they (the participants) knew that message was true. Because the message contradicted what the listener had seen 1 hour previously,

participants effectively judged that the listener would assign higher priority to the message than to direct observation in this particular context. Perhaps participants assumed the listener would think the message described a new state that supersedes the old state that they witnessed directly. This aspect of the results replicates previous research (Mitchell et al., 1996), and is uncontroversial (though see Perner & Davies, 1991).

The difference between subcultures became apparent in a scenario that was identical, except observing participants were devoid of additional information conveying that the message was true. Whether or not this information was available to participants should make no difference to their judgments, of course, because their task was to assess what the listener thinks, and the information available to the listener was constant across scenarios. The results, however, show that participants only from some subcultures were influenced by the presence or absence of the additional information. Those brought up in cities and/or who identified themselves as belonging to an individualistic community tended to judge that the listener (probably) disbelieved the message. In contrast, those brought up in a small village, and/or who identified themselves as belonging to a collectivist community, tended to judge that the listener (probably) believed the message.

This was supplemented by the finding that participants who said they were from collectivist subcultures tended to be identified as trusting, as revealed by the interpersonal trust questionnaire. Moreover, those identified as such tended to be the same who judged that the listener probably believed the message even in the condition with no additional information. This is consistent with the possibility that people from collectivist subcultures tend to be more trusting (and perhaps less cynical) to an extent that they project a trusting disposition onto others—in this particular case, the listener protagonist in the scenarios we presented. Trust emerged as a nearly significant mediator of the influence of subculture on credulity ratings, allowing us to speculate that it may indeed be the factor that influences the judgments of credulity ascribed to a protagonist.

The pattern of results associated with subcultures is especially notable when considering that subcultural classification was based on self-report. Had we not obtained significant effects, this might have been because participants were unreliable in identifying and reporting their subculture. Given that the effects were significant, this can be explained by supposing that most participants were reliably able to report their subculture. Future research should probably include a more objective measure of subculture, in addition to self-report, in order to further tease apart the effects of culture and trust on credulity.

A consequence of being inclined to judge that people are credulous was that participants from a village and/or a collectivist subculture did not vary in their assessment of the listener's belief whether or not they (the participants) had additional information that the message was true. Effectively, these participants divorced their own knowledge from the listener protagonist's, given that what they knew did not affect their assessment of what the listener believed. Apparently, those from cities and/or individualistic subcultures sometimes failed to divorce their own knowledge from the listener protagonist's. Do individuals from collectivist subcultures find it easier than those from individualistic subcultures to divorce their own knowledge from their estimate of another person's belief? If so, this would complement a finding reported by Greenfield et al. (2003), suggesting that young children from interdependent communities show an advanced understanding of the knowledge state of another person when this knowledge differs from their own.

The evidence obtained in these studies does not necessarily permit such a strong conclusion, as the following thought experiment demonstrates. Suppose the 'true message' condition were replaced with a 'false message' condition, where additional information available only to the participant conveyed that reality remained in accordance with the listener's direct observation. In that case, presumably the participants from an individualistic subculture would judge that the listener disbelieved the message. Given that they judge this way in any case, even without additional information, participants would

demonstrably be divorcing their own knowledge from the listener's belief. At this point, we do not know how participants from a collectivist subculture would judge. If they had privileged information saying that the message was untrue, perhaps they would judge that the listener disbelieved the message. However, if those from a collectivist subculture judged that the listener believed the message even in this condition, there would be a basis for considering that they have a better aptitude for divorcing their own knowledge from other people's beliefs compared with participants from an individualistic subculture. This deserves priority for future research.

Although we have no strong grounds for saying that the two subcultures differ in the extent to which they can divorce their own knowledge from other people's, it still appears that their understanding of the mind differs in a subtle way. Namely, participants from a village and/or a collectivist subculture seem inclined to suppose that people are basically credulous, while participants from a city and/or an individualistic subculture seem inclined to suppose that people are basically skeptical. We cannot be sure from our results which group of participants is correct in this respect—indeed, both groups could be correct in the sense that listeners who themselves belong to a collectivist subculture may be credulous while listener's from individualistic subcultures may be skeptical. Our participants may have assumed that the listener protagonist was like people they know, and estimated their evaluation of the message on that basis. According to Gilbert (1991), however, the collectivists rather than the individualists would be closer to the truth of the matter. Gilbert argues from a body of extensive and sound evidence that a fundamental quality of the human constitution leads us to be credulous—even if we delusionally think that we have a healthy skepticism (see also Mitchell, Robinson, & Thompson, 1999).

The current findings augment accounts of the role of culture in the development of psychological understanding. Much of the extant research has concentrated on the development of understanding the self, and how that varies in different cultures (e.g., Markus & Kitayama, 1991; Triandis, 1989). The current research can be construed as revealing how participant's judgments of other people's minds vary with the subculture the participant belongs to. This is relevant to understanding the self in that such understanding is partly relative to the contrasting understanding one might have about other people.

The current findings add to the picture in suggesting that people who are collectivist tend to think others believe what they are told and that others are basically credulous. In contrast, those who are individualistic are more cynically inclined to suppose that others would be mistrusting. Perhaps those who are individualistic think people tend to be wise to other's machinations or imperfections in giving a reliable verbal report. In contrast, perhaps those who are collectivist think people tend to interpret messages on face value and in this respect those who are individualistic might perceive them as socially naïve. Of course, these attitudes could reflect actual differences in social behavior between subcultures. Perhaps people in collectivist cultures deserve to be believed, whereas an attitude of skepticism might be essential for protecting oneself against exploitation in an individualistic culture.

ACKNOWLEDGEMENTS

REFERENCES

Doumanis, M. (1983). *Mothering in Greece: From collectivism to individualism*. New York: Academic Press.
Fischhoff, B. (1975). Hindsight not equal to foresight—Effect of outcome knowledge on judgment under uncertainty. *Journal of Experimental Psychology-Human Perception and Performance, 1*, 288–299.

Gilbert, D. T. (1991). How Mental Systems Believe. *American Psychologist, 46*, 107–119.

Greenfield, P. M., Keller, H., Fuligni, A., & Maynard, A. (2003). Cultural pathways through universal development. *Annual Review of Psychology, 54*, 461–490.

Hsu, F. L. K. (1985). The self in cross-cultural perspective. In A. J. Marsella, G. DeVos, & F. L. K. Hsu (Eds.), *Culture and self: Asian and Western perspectives* (pp. 22–54). London: Tavistock Press.

Kashima, Y., Kokubo, T., Kashima, E. S., Boxall, D., Yamaguchi, S., & Macrae, K. (2004). Culture and self: Are there within-culture differences in self between metropolitan areas and regional cities? *Personality and Social Psychology Bulletin, 30*, 816–823.

Markus, H. R., & Kitayama, S. (1991). Culture and the Self-implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224–253.

Mitchell, P., Robinson, E. J., Isaacs, J. E., & Nye, R. M. (1996). Contamination in reasoning about false belief: An instance of realist bias in adults but not children. *Cognition, 59*, 1–21.

Mitchell, P., Robinson, E. J., & Thompson, D. E. (1999). Children's understanding that utterances emanate from minds: Using speaker belief to aid interpretation. *Cognition, 72*, 45–66.

Nisbett, R. E. (2003). *The Geography of Thought: How Asians and Westerners think differently . . . . and why*. New York: Free Press.

Perner, J., & Davies, G. (1991). Understanding the mind as an active information processor—Do young-children have a copy theory of mind. *Cognition, 39*, 51–69.

Riggs, K. J., Peterson, D. M., Robinson, E. J., & Mitchell, P. (1998). Are errors in false belief tasks symptomatic of a broader difficulty with counterfactuality? *Cognitive Development, 13*, 73–90.

Robinson, E. J., Mitchell, P., & Nye, R. (1995). Young children's treating of utterances as unreliable sources of knowledge. *Journal of Child Language, 22*, 663–685.

Rotenberg, K. J. (1990). A measure of the trust beliefs of elderly individuals. *International Journal of Aging and Human Development, 30*, 141–152.

Rotter, J. B. (1967). A New Scale for Measurement of Interpersonal Trust. *Journal of Personality, 35*, 651–665.

Singh, P. N., Huang, S. C., & Thompson, G. G. (1962). A comparative-study of selected attitudes, values, and personality-characteristics of American, Chinese and Indian Students. *Journal of Social Psychology, 57*, 123–132.

Triandis, H. C. (1989). The self and social-behavior in differing cultural contexts. *Psychological Review, 96*, 506–520.