Thirty-one mother-child pairs participated as eyewitnesses of a simulated criminal event presented through VTR movies using the MORI technique (Mori, 2003). Although being presented the two different versions, the participants believed that they observed the same event together. Participants were to recall what they had observed together in several ways; individually immediate after the presentation, collaboratively being allowed to discuss to make a unified report, and individually again one week later. The main results were as follows: (a) mothers showed better memory performance than their children, (b) mothers’ opinions were not necessarily dominant in making their unified reports, and (c) there was no decisive tendency who conformed to whom among mother-child pairs in a-week-later individual reports. (116 words)

Keywords: eyewitness testimony, mother-child pairs, the MORI technique, conformity

Suppose an elementary school child and his/her mother happen to observe a criminal event or an accident in the street. What if their reports differed from each other despite the fact that they had witnessed the same event together? Whose report should police officers and public prosecutors believe to be correct? How will the eyewitness mother and child reconcile when they notice that their reports contradict each other? Common sense tells us that the police and prosecution should count more on the mother’s reports, and it should be assumed that the mother and child themselves would reach their final decision by choosing the mother’s opinion rather than the child’s, because it has been known that children are prone to make errors and more susceptible to misleading information (Cassel, Roebers & Bjoeklund, 1996; Goodman, Tobey, Batterman-Faunce, Orcutt, Thomas, Shapiro, & Sachsenmaier, 1998; Mazzoni, 1998). However, is this really what happens or should happen?

It is not unusual for two or more witnesses, not necessarily a mother and child pair, and regardless of their age or sex, to report differently even if they observed the same event. However, only a few studies (Gabbert, Memon, & Allan, 2003) have been carried out regarding how such discrepancies would be reconciled among the witnesses, and whether their final decision would be correct or not. This may have been because it was difficult for the researchers to produce an experimental setting in which two groups of participants/witnesses would report differently after having presumably observed the same event.

Mori (2003; 2007) invented a presentation technique which allowed two different versions of the same event recorded in movie clips to be projected onto the same single screen with two witnesses wearing different types of polarizing sunglasses observing only one version and never being aware of the other. Using this technique, Kanematsu et al. (1996/2003) showed that witness pairs who observed the same event but with hidden discrepancies tended to change what they had observed by conforming to their co-witnesses through discussion just after the event presentation.

Garry, French, Kinzett, and Mori (2008) have replicated the Kanematsu et al. study using the MORI technique with undergraduates at a New Zealand university. Mori and his colleagues have also conducted a series of experiments to investigate the behavior of witnesses who
observed the same event differently with various types of witness combinations: couples vs. strangers pairs (French, Garry, & Mori, 2008), male vs. female pairs (Hirokawa, Matsuno, Mori, & Ukita, 2006), one witness vs. two witnesses, and two witnesses vs. two witnesses (Mori & Mori, 2008), and pre-school children pairs (Mori & Takahashi, 2004). The primary purpose of the present study was to obtain answers to the questions posed at the beginning of this paper by creating discrepancies between mother-child witness pairs in laboratory experiments using the MORI technique.

Goodman, et al. (1998) showed that elder children tended to recall more correctly than younger ones when asked to recall what they observed in the free recall paradigm. Meanwhile, Cassel, et al. (1996) investigated memory of visually presented events and susceptibility of post-event information among preschoolers, second-graders, fourth-graders, and adult participants, finding that preschoolers were the most susceptible to wrong information provided after the event. These studies provided evidence that witness memory improves with age and so does resistance to susceptibility. Therefore, we set the following series of experimental hypotheses:

Hypotheses: a) Among mother-child witness pairs, mothers are expected to have better recall, b) in cases of discrepancies between their memory reports, the mother’s opinion is likely to prevail as their group decision, and c) once the group decision has been made, children would be more likely to conform to the group decision even when asked to report individually again.

METHOD

Participants

Thirty-one mother-child pairs (13 first graders, 6 boys and 7 girls; 4 second graders, 3 boys and 1 girl; 5 third graders, 5 girls; 4 fourth graders, 1 boy and 3 girls; 3 fifth graders, 1 boy and 2 girls; and 2 sixth graders, 2 boys) participated in the experiment.

Presentation Materials

The simulated criminal event: The same videotapes and presentation equipment used in Kanematsu et al. (1996/2003) were used in this experiment. The outline of the criminal event and the three differing critical items are explained below. The total duration of the event was about one minute. No sound was presented during the experiment.

Outline of the event: A car pulled up in front of a pedestrian (female) standing by the road near a mountainside. The driver (male) got out of the car with the map in his hand to ask her for directions. While she was explaining the directions using a map, having left her bag on the ground, another passenger (female) sneaked out of the car to steal something from the bag and returned to the car. Then the driver bowed his thanks to the pedestrian and drove away. The pedestrian started walking again without noticing the thievery.

Three critical items: The following three elements differed between the two versions: (a) the color of the car, a dark car (Version A) vs. a white car (Version B); (b) the clothes of the driver, a parka with stripes (Version A) vs. a white shirt (Version B); and (c) the direction of the pedestrian after the robbery, walking up toward the screen (Version A) vs. walking down away from the screen (Version B).

Presentation Apparatuses

The experimental apparatuses were equivalent to those used in the Kanematsu et al. study.
A half-transparent screen and polarizing sunglasses were newly prepared for the present experiment. (See, Mori, 2003 for details of the experimental apparatuses and configurations.)

**Video projectors:** Two LCD video projectors (JVC PD-V7) were used. They had a 0.7-inch LCD panel with approximately 100,000 pixels. The illuminance of the 12v 30W projection lamp was approximately 15 lx. Liquid crystal displays (LCDs) are composed of a liquid crystal layer sandwiched between a pair of polarizing filters. Therefore, the projected image from an LCD projector is polarized. Placing an LCD projector sideways can create an image polarized perpendicular to an ordinary projection. The projectors were mounted on tripods and set side by side approximately 60 cm behind a half-transparent screen to project two different images polarized perpendicularly to each other.

**Half-transparent screen:** A 20cm x 20cm plain ground glass pane 5mm thick was used as a half-transparent screen. It was mounted on a 180cm (height) x 90cm (width) x 0.5cm (thickness) wooden panel which contained a 20cm x 20cm window in the middle for the screen. Two versions of the video images were projected onto the same half-transparent screen. Because one of the video projectors was placed sideways to make its polarized image perpendicular to the other, the intersection of the two images became a square of the shorter side of the two rectangles. Therefore, the screen shape was a square rather than a regular 3:4 rectangle.

**Polarizing sunglasses:** Two types of polarizing sunglasses suitable for viewing either of the video images were prepared. They looked similar to ordinary sunglasses, and were almost identical to each other. They were made using ordinary sunglass frames and cutouts from a sheet of polarizing filter of 0.8mm thick.

**Memory Tests**

**Test periods:** The witnesses memory was assessed three times: “Immediate Reports,” just after the video presentation (individually), “Collaborative Reports,” during discussion (in pairs), and “After-discussion Reports,” a week after the discussion (individually).

**Multiple-choice cued recall test sheets:** The assessment of witness memory was done by means of multiple-choice cued recall tests. The test consisted of 18 multiple-choice questions to assess the subjects’ memory of the videotaped event. Of those, three questions concerned the three critical items. Because the questions were ordered in basically the same sequence as the event, the last question was the walking direction of the pedestrian, one of the three critical items. In order to avoid ending the memory test with a critical item, two dummy easy questions were added at the end. The same test sheets were used in all test periods and for all participants except for the first and second graders, for whom the same test sheets were enlarged (144%) by a photocopy machine.

**Procedure**

The experimental procedure was basically a replication of the Kanematsu et al. experiment. Mother-child pairs came to the university campus to attend a Saturday extension class entitled “Introduction to Psychology for Children and Their Mothers.” After the class, the experimenter asked them to participate in the experiment and all of them accepted the request.

**Video Presentation Phase.** The first phase of the experiment was carried out after the class. In the first phase, the video presentation, immediate memory test, discussion, and post-discussion memory test were administered to the participants.
Presentation: Participants entered a laboratory in pairs and sat on chairs facing the screen approximately 1m apart. Two types of sunglasses, one pair for Version A and one for Version B, were set on the table in front of them. Participants chose a pair at will. They were instructed to wear the sunglasses to watch a videotape about one minute long of an event that happened in the dark.

Immediate Reports: After watching the videotape, the participants’ recollection of the event was assessed individually by means of multiple-choice cued recall tests. No time limits were set, but it took about five to ten minutes to complete the reports. For 1st and 2nd graders, undergraduate students majoring in psychology assisted them in taking the test. The assistants were trained beforehand how to handle young children and how to induce their responses without biasing them.

Discussion: After completion of the Immediate Reports, participants were asked to talk together for five minutes. During the discussion period, they were allowed to look at their reports but not to change what they had written. At the end of the discussion period, Immediate Reports were collected.

Collaborative Reports: Participants were instructed to make a unified report on what they had observed on a new test sheet identical to the Immediate Report. It took about five minutes to complete it. After collecting the test sheet, the experimenters expressed thanks for their having participated in the memory experiment in order to give an impression it was the end of the experiment.

Post-discussion Report Phase. Approximately a week after the discussion, participants were instructed to take a memory test individually again using the same form of the test sheet. This last phase of the experiment was carried out using mail. The experimenter sent two test sheets with an instruction letter to the mothers asking them to conduct the memory test by themselves and send it back to the experimenter using a self-addressed envelope. They were also instructed to fill in a questionnaire inquiring about the following two points: (a) whether they noticed any anomalies in the video presentation, and (b) how they reconciled the situation when they found any discrepancies between their child’s reports and their own.

The mail was posted on Thursday and delivered on Friday. The experimenter called them on Friday evening to ask for their cooperation for the present study and make the instructions clear to the participants. Most answer mails came back within the following week. For those failing answer, the experimenter made a follow-up call to the participants asking them to send back their answers.

RESULTS

Data Availability

The experiment comprised two phases: the video presentation phase and the post-discussion phase. Only the data obtained from the participant pairs in which both members attended the both phases were used for the analyses. We let the participant pairs to choose one pair of sunglasses at will so that they would not notice there were two types of sunglasses. This procedure ensured that the experimenters themselves could not tell which participant wore which type of sunglasses. Therefore, we judged who wore which type based on their answers for the critical items in the immediate memory reports. This judgment procedure worked nearly perfectly, discriminating all the participant pairs except a few pairs that were excluded from the analyses. Finally, data from 24 mother-child pairs were used in the following analyses.
Since 24 pairs of mothers and children picked up the two types of sunglasses at will, the number of mothers who watched Version A and those who watched Version B were not necessarily set to be equal. However, those numbers happened to be almost half and half; 14 mothers watched Version A and 10 watched B, not significantly different ($\chi^2(1)=1.33$, $p>.10$).

**Calculation of Memory Test Scores**

Following the Kanematsu et al. study, the memory test scores were calculated in percentage scores; the number of items correctly reported divided by the total number of items (=18) and multiplied by 100. Each test contained three questions concerning the three critical items that had two correct answers depending on which version the participants observed.

**Comparison of Memory Scores: Hypothesis a**

We hypothesized that mothers would likely outperform their children (Hypothesis a). The memory scores were analyzed to find out whether the hypothesis turned to be true.

The results showed the average memory score for mothers was 74.31, whereas that for children was 63.66. The difference was significant ($t(43) = 2.33$, $p<.05$). The result supported the hypothesis a that mothers should have better recall than their children.

It should be noted here that the two video versions used in the present experiment were prepared so as to be identical except for the three critical items. Therefore, it was assumed that the immediate memory scores would not be different for both versions. However, the memory scores were higher for Version B (74.5) than those of Version A (63.4) ($t(43) = 2.88$, $p<.01$)

Nevertheless, the higher scores of mothers were not attributed to the unexpected asymmetry of the video versions, because they performed better despite the fact that more mothers (14 out of 24) watched Version A.

**Dominance in Making Group Decisions: Hypothesis b**

We also hypothesized that in cases of discrepancies between their memory reports, the mother’s opinion would be taken over her child’s as their group decision (Hypothesis b). Therefore, we examined which opinions were taken in the collaborative reports which were made after the discussion.

Preliminary analysis was needed to decide which items would be used to test Hypothesis b. The critical items did not necessarily produce discrepancies between mother and child, because in some cases, one or the other of them left the question unanswered in the immediate report. If one of them had not answered on the immediate memory test, the other one who had had an answer would be dominant regardless of whether it was mother or child. Therefore, we excluded the cases in which one member of the pair left the question unanswered.

We found that children’s opinions were taken 74, whereas mothers’ were 54 out of 128 cases. The $\chi^2$ tests showed the tendency was nearly significant ($\chi^2(1)=3.125$, $.05<p<.10$) but the opposite direction of the hypothesis b. The results clearly denied the hypothesis that the mother’s opinion would be likely to prevail as their group decision.

**Analyses of Conformity in Post-discussion Report: Hypothesis c**

We defined “conformity” as a change in the answer in the Post-discussion Report towards the group decision in the Collaborative Report. For example, a typical conformity was the following case: one witness who had answered “white car” in the Immediate Report, once
confronted with the other’s answer “dark car” during the discussion, conceded their group decision as “dark car” in the Collaborative Report, and a week later, changed his/her answer to “dark car” in the Post-discussion Report. We also included cases in which the witness had no answer in the Immediate Report.

We hypothesized that children would be more likely to conform (Hypothesis c). This hypothesis could be tested directly by examining who conformed to whom more often among mother-child pairs. Among the 24 mother-child pairs, there were 168 cases in which discrepancies existed in their Immediate Reports. Of these occasions, conformities occurred 92 times. Mothers conformed to their children 41 times, whereas children conformed to their mothers 51 times. Those occurrences of conformity were further divided in terms of the video versions. Table 1 shows the 2 x 2 breakdown of the total 92 conformities observed among the 24 mother-child pairs.

The $\chi^2$ tests revealed no significances between the frequencies of mothers’ and children’s conformity, nor the video versions ($\chi^2=1.08$, ns). However, the interaction was significant ($\chi^2=8.06, p < 0.01$). This was because children who observed Version A (the less memorable one) conformed most frequently (35/92). However, the second largest number of cases occurred in the opposite scenario; these were 25 cases of conformities from mothers who observed the more visible Version B to children having observed Version A.

These results were rather contradictory and difficult to interpret. Nevertheless, it should be concluded that Hypothesis c was not supported because the frequencies of conformity were not significantly different between mothers and children.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Who Conformed to Whom among Mother-Child Pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Version A</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>Mother→Child</td>
<td>16</td>
</tr>
<tr>
<td>$\chi^2=8.06, p &lt; 0.01$</td>
<td>$\chi^2=1.08$, ns</td>
</tr>
<tr>
<td>Child→Mother</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
</tr>
<tr>
<td>$\chi^2=1.08$, ns</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

Were Conformities Good or Bad?

From the classic study of Asch (1958) up to the recent experiment preceding the present study (Kanematsu et al., 1996/2003), studies of conformity have focused on its negative side. In the Acsh experiment, a naïve participant answered wrongly, conforming to the majority that was a group of confederates in reality. Kanematsu et al. (1996/2003) found that participants/witnesses easily changed their reports of what they had actually observed when challenged by a co-witness’ different opinion. In both studies, regardless of confederates’ involvement, conformity served as a source of distortion. However, conformity has positive aspects as well. Witnesses having misperceived the original event may correct their memory through conforming to the correct information.
Hypotheses $b$ and $c$ were based on the assumption that the witnesses with worse memory would conform to those with better memory; in the present experiment, the presumption was that the latter would be the mothers. Although both hypotheses were proved to be not true, the hidden presumption was not fully examined. The mothers of the present experiment realized the weak parts of their recollection and conformed to their children only when it seemed necessary to do so. However, there happened to be relatively large number of weak parts and it resulted in frequent accommodation by the mothers. If this is true, the mothers’ conformity must have occurred more often in the direction of correct answers than in the opposite direction. This can be examined by classifying all the conforming cases into right or wrong ones, and counting them for mothers and children separately. There were 59 cases out of 92 conformity cases among the mother-child pairs that could be classified either right or wrong. Table 2 shows the correct and incorrect conformities for mothers and children. Although it was found that conformity occurred twice as often in the correcting direction than the other direction ($\chi^2 = 10.59, p<.01$), a $\chi^2$ test revealed that there was no significant bias among the occurrence of accurate accommodations among the mothers ($\chi^2 = 1.95, ns$).

<table>
<thead>
<tr>
<th></th>
<th>Correct</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother→Child</td>
<td>14</td>
<td>9</td>
<td>23</td>
</tr>
<tr>
<td>Child→Mother</td>
<td>28</td>
<td>8</td>
<td>36</td>
</tr>
</tbody>
</table>

$\chi^2 = 1.95$, ns

Total 42 17 59

$\chi^2 = 10.593$, p<.01

Why did mothers defer to their children?

In the mother-child witness pairs, the child’s opinion was acknowledged more than equally in making their group decisions after having discussed the differing points. It was also found that they conformed to each other almost equally in the week-later reports in which they answered individually. These results were counter-intuitive, and contradicted our experimental hypothesis, that mothers would be dominant in making their group decision because they would be superior not only in memory per se, but also in comprehensive cognitive skills and knowledge. Why did the mothers honor their child’s opinions more frequently than we expected?

According to the questionnaire answered by the mothers at the end of the experimental sessions, they stated that they regarded their child’s answer as more suitable when they were not so confident of their own recollection. They also stated that they respected their child’s opinion as much as possible in their daily life as well.

It is noteworthy that the results showed that mothers were not necessarily dominant in making the pair’s unified answers and that children were not so susceptible to their mother’s opinions in spite of the fact that the mothers were generally superior in observation and memory.
It should also be noted that conformity occurred more frequently in the direction of correcting misperceptions rather than distorting correct ones. The latter finding was a reconfirmation of the common sense expectation, whereas the former one was counter-intuitive.

These results are especially important for forensic applications. The present findings showed that the direction of conformity was not necessarily decided by a witness’ social standing nor by their cognitive superiority. These results serve to warn us that it can be dangerous to rely on common sense when it comes to presumptions about conformity.

REFERENCES

HOW CHILD-MOTHER PAIRS REPORTED WHAT THEY HAD WITNESSED TOGETHER


**Acknowledgments.** This research was done while the first author was at Shinshu University. It was supported by a Grant-in-Aid from the Japanese Ministry of Education, Culture, Sports, Science, and Technology (Grant No.13610081) to KM. A part of the present study was taken from the master’s thesis of the second author submitted to Shinshu University. We are indebted to Rebecca Anne Marck for her superb work in editing the English manuscript.