

# Conformity of Six-Year-Old Children in the Asch Experiment without Using Confederates

Aiko Hanayama<sup>1</sup>, Kazuo Mori<sup>2</sup>

<sup>1</sup>Scientific Investigation Laboratory, Aomori Prefectural Police, Aomori, Japan;

<sup>2</sup>Institute of Engineering, Tokyo University of Agriculture and Technology, Tokyo, Japan.

Email: kaz-mori@cc.tuat.ac.jp

Received July 25<sup>th</sup>, 2011; revised August 28<sup>th</sup>, 2011; accepted September 29<sup>th</sup>, 2011.

We investigated the conformity of young children without the use of confederates by utilizing the fMORI-Asch paradigm. The Asch-equivalent tasks were presented by means of a presentation trick so that one participant observed different stimuli than the other three, creating a minority-majority confrontation without using confederates. Ninety-six Japanese first graders (6 - 7 years old; 48 boys and 48 girls) participated in same-sex groups of four. The response order was randomly assigned and the third responders observed the standard lines differently from the other three children. The results showed that the minority children who had observed different stimuli tended to make more errors than the other three children. No gender differences were observed.

*Keywords:* Conformity, Group Conflict, Majority Influence, fMORI Technique, Asch Line Judgment Tasks

## Introduction

Asch (1955, 1956, 1958) showed that a minority participant often conformed to the responses of a unanimous majority irrespective of the fact that the majority's choice seemed incorrect. The majority participants in these experiments consisted of confederates, who had been instructed to respond incorrectly on several trials. The minority participant was a naïve participant. Asch's findings have been replicated using a number of different manipulations (country, majority size, or gender), but not with child participants (see Bond & Smith, 1996, for review).

The reason there were so few Asch experiments using child participants seemed to stem from the difficulty of finding good child confederates to serve as the majority. Crutchfield (1955) developed an alternative experimental procedure in which each participant sat separately in a cubicle. The experimenter then fed participants information that presumably had come from the other participants. In this way, the Crutchfield paradigm avoided the problem of using confederates. However, it has a disadvantage because it doesn't allow face-to-face interaction among participants.

Did children conform more than adults in the Asch experiments? Little is known about this interesting question because of the lack of literature on the conduct of those experiments with child participants. However, there were findings in a related area in which the experimental results showed that child witnesses were more susceptible to information given by others. (See a review by Ceci and Bruck, 1993). Having reviewed intensively the past 15 years of studies on child suggestibility, Ceci and Bruck (1993) concluded that the younger the children, the more susceptible they were.

Notable among the few studies that used child participants in conformity experiments was Costanzo and Shaw (1966). They avoided the problem of having young children act as confederates by using the Crutchfield paradigm. They examined conformity among four age groups of children and young adults (7 - 9, 11 - 13, 15 - 17, and 19 - 21 years old) and found that conformity was lowest for the youngest age group (7 - 9 years old), increased to an asymptotic point for the 11-to-13-year-old

group, and decreased for the other two age groups. Costanzo (1970) interpreted this result to mean that pre-school children were enmeshed in family interaction and guided by parental standards, whereas older children were influenced more by those in their peer group as they moved into adolescence. This interpretation did not contradict the findings of Ceci and Bruck (1993): Young children tended to be susceptible to adults but not to conform to members of their peer groups.

More recently, Walker and Andrade (1996) conducted a genuine Asch-type experiment with 110 Australian boy participants between ages 3 and 17. They placed one participant in the position of minority against a wrong but unanimous majority of three, comprising child confederates of the same age group. Six line judgment tasks similar to those used in the original Asch study were given, among which the fourth and sixth ones were experimental wherein the effect of social pressure was tested against the unanimous majority of wrong answers. They found that the younger the participants were, the more conformity occurred. Eighty-five percent of the children aged 3 - 5 years conformed, 42% conformed in the 6 - 8 year-old group, 38% for 9-to-11-year-olds, 9% for those 12 - 14 years old, and none conformed among those aged 15 - 17.

Walker and Andrade (1996) excluded the explanation of the poor performance of the 3-to-5-year-old participants being attributable to simple errors or misunderstanding of the task because only two of the 20 children in this age group made errors in the practice trial. Instead, they interpreted the discrepancy between their results and those resulting from preceding studies such as Costanzo and Shaw (1966) to have come from differences in task difficulty. Their Asch-like tasks were composed of unambiguous stimuli, whereas the tasks used in Costanzo and Shaw (1966) were somewhat more ambiguous.

But Walter and Andrade (1996) did not examine the most plausible interpretation: did their confederates act naturally enough to fool the other participants? It is possible to assume that the ability to prevaricate develops as a person ages, and so might the ability to detect dissimulation. If detecting ability develops more sharply than pretending ability, then the likelihood of detection increases with age. Conflicting results among

various conformity studies may have stemmed from this crucial interplay between the dissimulation ability of confederates and the detection ability of participants.

To address this possibility, Mori and Arai (2010) replicated the original Asch experiment without using confederates. Rather, they used a presentation trick (the fMORI Technique; Mori, 2007) that allowed the presentation of two different visual stimuli without viewers' noticing the duality. The results showed that minority women conformed to the majority (although men did not). A post-experimental questionnaire confirmed that no participant among either the minority or majority viewers noticed the presentation trick. In short, the fMORI-Asch paradigm reproduced the Asch experiments without using confederates.

In our experiment, we aimed to apply the same technique to determine whether we could observe the conformity behavior of young children under social pressure without the use of confederates. Following the findings of Ceci and Bruck (1993) and Walter and Andrade (1996), we hypothesized that our young subjects would conform more frequently than undergraduates did in Mori and Arai (2010).

## Method

### Participants

Ninety-six first-grade elementary school children (48 boys and 48 girls) participated in same-sex groups of four. In order to examine possible gender differences, we included both boys and girls in our sample. All the participants were from a municipal school in a middle-sized, somewhat rural city in Japan. The socio-economic status of the subjects' families varied within a narrow middle-class range. We asked the class teachers to make groups of children minimizing the within-group differences as much as possible. Then we randomly assigned the response order in each group.

### Experimental Design

The study was a 2 (role: minority vs majority)  $\times$  2 (gender: boys, girls) between-subjects factorial design. The dependant variable was the frequency of errors during the six critical tasks for each participant.

### Stimuli

We used the same stimuli as in Mori and Arai (2010) in which the same nine stimulus sets that Asch (1956) had used were reproduced using Adobe Photoshop and projected on a rear-projection screen. In Asch (1956) the standard line was drawn in black on a white card and the three comparison lines were drawn on another card placed about 1 m apart from the first one. Our standard and comparison lines appeared on the same screen about 1 m apart. The standard line appeared on the left of the screen and was 5.08 to 25.40 cm long, or the same length as on the cards in Asch (1956). The three comparison lines were also replicated in the same length as those of Asch (1956).

Three of the nine stimulus sets were used for neutral trials in which the same stimuli were presented to both the minority and majority viewers. These neutral sets corresponded to the control tasks of the Asch experiments in which the confederates answered correctly. The remaining six sets were used in the critical tasks so that the minority viewer would observe the standard lines differently from the other three majority viewers. In these

trials, the top part of the standard lines appeared in either green or magenta so that the two groups of participants would see them differently through polarizing sunglasses when the lines were projected with the fMORI Technique (See Figure 1).

### Apparatus

The same experimental apparatus as used in Mori and Arai (2010) were set up in the multipurpose room of the elementary school attended by the participants. The stimuli were presented on PowerPoint slides with a personal computer (Apple iBook) and projected by an LCD projector (EPSON ELP-730) onto a rear screen made of plain ground glass (80 cm  $\times$  160 cm). The rear screen was set about 1.4 m away from the projector. Four chairs were placed in a row about 2 m apart on the other side of the screen. Four pairs of polarizing sunglasses like those used in Mori and Arai (2010) were provided. They all looked identical but in reality differed in the polarization: vertical vs horizontal. Three identical pairs were used for the majority with one different pair provided for the minority viewer. One pair of polarizing sunglasses was placed on each chair before the participants entered the experiment room. The minority participant's sunglasses were placed on the third chair.

### Post-Experimental Interview

Following the line judgment tasks, experiment assistants interviewed the participants individually. The assistants were undergraduates majoring in elementary school education and educational psychology and were familiar with child interviewing techniques. In this interview, the children were asked whether they had noticed any anomaly in the images, and whether they had detected any visual illusions during the tasks.

### Procedure

Participants were led by their class teacher into the experiment room and were asked to take a seat in one of four chairs, each with a pair of sunglasses on it. The seating order (response order) was randomly assigned before the subjects entered the experiment room. After they were seated with the sunglasses in hand, a female experimenter (the first author) gave the same general instructions as Asch (1956) did, saying:

"This is a task involving the discrimination of lengths of lines. In front of you is a screen. On the left of the screen there will be one line, and on the right there will be three lines differing in length; they are numbered 1, 2, and 3, in order. One of the three lines at the right is equal to the standard line at the left. You will decide in each case which of the three is equal in length to the one on the left. You will state your judgment in terms of the number of the line. There will be nine comparisons in all. As the number of comparisons is few and the group small, I will call upon each of you in turn to announce your judgments,



Figure 1. An example stimulus used in the Asch equivalent task. The greenish part at the top of the left line can or cannot be seen depending of the types of polarizing sunglasses.

which I will record here on a prepared form. Since your seat order was determined by draw before entering the laboratory, you will give your answer in the seat order, from 1 to 4”.

Then, the experimenter double-checked whether they all knew their answering order by asking them to reply in that order. Finally, the experimenter instructed them to pay special attention to the following three points.

1) Please be accurate as possible. You don't have to answer quickly.

2) Please make the judgment all by yourself.

3) Please do not talk or react to the other participants and stay quiet unless it is your turn to answer.

After all the instructions were given, the experimenter told participants to put on the sunglasses to protect their eyes from glare. Then the experimenter presented the line judgment trials to the participants in the predetermined order. Each trial took approximately 30 seconds.

In Mori and Arai (2010) the participants completed 18 trials, the same nine-stimulus set twice, as those in Asch (1956). However, we presented the nine-stimulus set only once because the young child participants were expected to have much shorter attention spans than adult participants. Of the nine-stimulus set, three trials (1st, 2nd, and 5th) were neutral, with all viewers seeing the same thing. In the remaining six trials (3rd, 4th, 6th, 7th, 8th, and 9th), the minority and majority participants saw the standard lines in different lengths. After the line judgment tasks were completed, participants were individually interviewed and debriefed.

## Results and Discussion

### Manipulation Check

The post-experimental interview revealed that no child noticed any anomaly during the tasks, a finding that fits with Mori and Arai (2010). The children who wore the different type of sunglasses and responded third made more errors than the other three participants who wore the same type of sunglasses. This response pattern clearly showed that a minority of one performed differently from the other three who formed a majority group. Thus, the fMORI-Asch experimental paradigm successfully created majority and minority viewers among naïve child participants without introducing confederates.

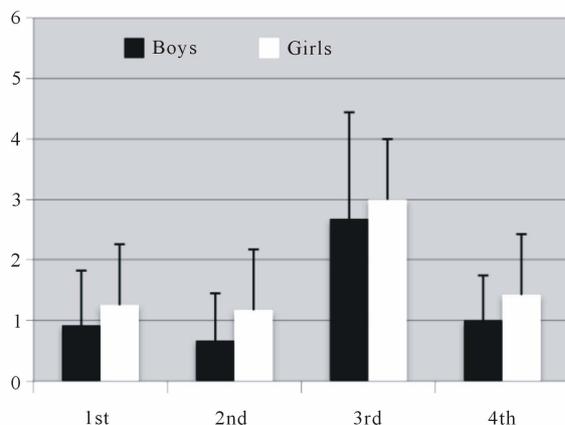


Figure 2. Average number of errors in response order (max. = 6; vertical lines represent standard deviations). The third responders were the minority participants.

### Conformity

The minority children made more errors than the other children, indicating that they had tended to conform to the majority. Unlike in the Asch experiments, the children in the majority condition were not confederates in our study. They made errors occasionally, as did the children in the minority. As in Mori and Arai (2010), we examined the average number of errors of the participants by order of response. (See Figure 2: the 3rd responders were the minority. The majority consisted of the 1st, 2nd, and 4th responders.)

The 2-way ANOVA clearly showed that the third responders who wore the different type of polarizing sunglasses made more errors (2.83 of 6 tasks; 47.2%) than the other three, who performed in a similar way irrespective of the response order (1.08, 0.92, and 1.21, for 1st, 2nd, and 4th responders, respectively):  $F_{(3,88)} = 11.22, p < .01$ . These results revealed that the minority children erred more because they conformed to the majority.

### No Gender Differences

Unlike Mori and Arai (2010) we found no gender differences in terms of error frequencies of the minority children under social pressure (No main effect nor interaction with response order,  $F_{(1,88)} = 2.22, ns$ , and  $F_{(3,88)} = 0.02, ns$ , respectively.). In Mori and Arai (2010), a sizeable percentage of undergraduate women in the minority situation showed conformity to the majority whereas almost no undergraduate men conformed, even when they were in the minority under the social pressure of the majority. In contrast, our 6 - 7 year-old boys showed levels of conformity frequency similar to those of the girls of the same age.

### Did Young Children Tend to Conform More than Adults?

The answer is yes, but only boys conformed more than adult men. Young boys aged 6 - 7 tended to conform more often than older men did. In Mori and Arai (2010), undergraduate men did not conform even if they were in the minority position. However, the young boys in the present study did conform to the majority when they were in the minority. As for women, we found a similar pattern of conformity with young girls in the present study as with undergraduate women in Mori and Arai (2010). Minority young girls erred more often (3.0 of 6 tasks; 50.0%) than minority undergraduate women did (3.4 of 12 tasks; 28.6%). However, the overall error frequency of the child participants was higher than that of the undergraduate participants. We assumed that the errors in the minority groups consisted of conformity errors and simple perception errors that also occurred in the majority groups. In other words, we could estimate the net conformity error rates by extracting the error rates of the majority groups from those of the minority groups. The estimated conformity rate of young girls (50.0% - 21.3% = 28.7%) was almost equivalent to that of undergraduate women (28.6% - 8.6% = 20.0%) in Mori & Arai (2010), while that of boys (44.4% - 14.4% = 30.0%) was much higher than undergraduate men (5.0% - 8.15% = -3.1%: the error rate of the minority was lower than that of the majority man participants). It suggests the interesting hypothesis that boys decrease conformity in the course of their development while girls retain a similar conformity rate throughout their development. To examine this hypothesis, it would be desirable to conduct another fMORI-Asch experiment using early adolescent boys and girls.

## Acknowledgements

This research was supported by a Grant-in-Aid from the Japanese Ministry of Education, Culture, Sports, Science, and Technology (Grant No.16653054) to KM while the authors were at Shinshu University. We thank all the pupils and teachers in Wakatsuki Elementary School in Nagano City for their cooperation in the conduct of this research. We are indebted to Maryanne Garry for her constructive comments on the earlier draft. We express our thanks to Rebecca Ann Marck for her work in editing the English manuscript.

## References

- Asch, S. E. (1955). Opinions and social pressure. *Scientific American*, 193, 33-35. doi:10.1038/scientificamerican1155-31
- Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monograph: General and Applied*, 70, 395-407.
- Asch, S. E. (1958). Effects of group pressure upon modification and distortion of judgments. In E. E. Maccoby, T. M. Newcomb, & E. L. Hartley (Eds.), *Readings in social psychology* (3rd ed., pp. 174-183). New York: Holt, Rinehart & Winston.
- Bond, R., & Smith, P. B. (1996). Culture and conformity: A meta-analysis of studies using Asch's (1952b, 1956) line judgment task. *Psychological Bulletin*, 119, 111-137. doi:10.1037/0033-2909.119.1.111
- Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. *Psychological Bulletin*, 113, 403-439. doi:10.1037/0033-2909.113.3.403
- Costanzo, P. R. (1970). Conformity development as a function of self-blame. *Journal of Personality and Social Psychology*, 14, 366-374. doi:10.1037/h0028983
- Costanzo, P. R., & Shaw, M. (1966). Conformity as a function of age level. *Child Development*, 37, 967-975. doi:10.2307/1126618
- Crutchfield, R. S. (1955). Conformity and character. *American Psychologist*, 10, 191-198. doi:10.1037/h0040237
- Mori, K. (2007). Projecting two words with one machine: A method for presenting two different visual stimuli using just one projector without viewer noticing the duality. *Behavior Research Methods*, 39, 811-815. doi:10.3758/BF03192973
- Mori, K., & Arai, M. (2010). No need to fake it: Reproduction of the Asch experiment without confederates. *International Journal of Psychology*, 45, 390-397. doi:10.1080/00207591003774485
- Walker, M. B., & Andrade, M. G. (1996). Conformity in the Asch task as a function of age. *The Journal of Social Psychology*, 136, 367-372. doi:10.1080/00224545.1996.9714014