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小心: 不同人種的眼神暗示對於協同合作的影響

Watch out: The effects of race-related cues on cooperative behavior

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摘要

這個研究調查了人種與眼神暗示在協同合作行為上的關係，包含了田野調查與實驗，實驗對象是台灣的大學生，調查個人的合作程度是否會因為看了不同人種的眼神暗示而有所不同，實驗的資料(Study 2)顯示，黑人的眼神比亞洲人(一樣的種族)的眼神更容易引出協同行為，而黑人和白人相比與亞洲人和白人相比都沒有明顯差異，這兩個實驗與西方文化背景下的實驗發現呈現了相反的結果，對台灣人來說，眼神的照片並不會比花的照片引出更多協同合作。這是第一個研究調查協同合作、人種與眼神暗示之間的關係，我們將會討論更多未來可以進行的研究方向。

關鍵詞：協同合作，眼神暗示，眼神，人種，作弊行為

Watch out: The effects of race-related cues on cooperative behavior

Antonia Berki

Abstract

This research examines the relationship between race and subtle eye cues on cooperative behavior. A field study and a laboratory experiment conducted with Taiwanese college students were used to investigate whether individuals' level of cooperation would differ according to the type of race of the visual cues present. Data from the experiment (Study 2) showed that cues of Black eyes elicited more cooperative behavior than cues of Asian (same-race) eyes. There was no difference between Black and White eyes or between Asian and White eyes in the level of cooperation elicited. Both studies showed that contrary to findings from research conducted in Western cultural contexts, pictures of eyes did not elicit more cooperative behavior among Taiwanese compared to pictures of flowers. The present study was new in that it was the first study to investigate the link among cooperation, race, and eye cues. Implications and recommendations for future research directions will be discussed.

Keywords: cooperative behavior, subtle cues, eyes, race, cheating

Contents

Introduction

Why people behave cooperatively with non-kins, when cooperative behavior is unlikely to be reciprocated later, had been an evolutionary puzzle (Ernest-Jones, Nettle, & Bateson, 2011). Early studies have explained cooperative behavior among non-kins in light of external factors, suggesting that people have the tendency to evaluate the social benefits and costs of a behavior, including the possible formation of a bad social reputation, the likelihood of getting caught, and the magnitude of the punishment if caught (Becker, 1968; Haley & Fessler, 2005; Milinski, Semmann, & Krambeck, 2002). More recent studies, however, have highlighted the significance of internal factors. Even though some people desire the benefits of non-cooperative behavior and want to get away with minimal costs, they also want to maintain a positive self-image. For instance, if a person's self-image does not remain intact following a non-cooperative action, he/she will choose to cooperate rather than cheat (Mazar, Amir, & Ariely, 2008; Shalvi, Handgraaf, & De Dreu, 2011).

In spite of a number of theories that are available to explain cooperative behavior directed towards non-kins, little is known about how subtle cues in our social environment influence people's decision to act in a cooperative manner (Haley & Fessler, 2005). Among the few studies that have examined the effects of environment cues, none have seriously considered the ways in which race cues of eyes can influence the likelihood that individuals will cooperate.

Cooperative Behavior and Eye Cues

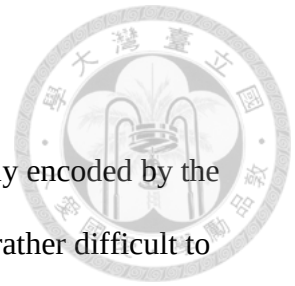
Cooperative behavior can be defined as a type of behavior that is legally and morally acceptable to society (Jones, 1991), or a type of behavior that benefits others at a short-term cost to the self (Ernest-Jones et al., 2011). In psychological research, the term "cooperative behavior" has been used interchangeably with *ethical*, *moral*, *contributive*, *pro-social*, *decent, honest behavior*, and *refrain from cheating*, whereas "non-cooperative behavior" has appeared interchangeably with *deceiving*, *lying*, *stealing, being dishonest*, *immoral*, and *bending of rules* (e.g., Bateson, Nettle, & Roberts, 2006; Declerck et al., 2011; Shalvi, Dana, Handgraaf, & De Dreu, 2011; Shalvi, Eldar, & Bereby-Mayer, 2012).

Eye cues have a strong effect on individuals' cooperative behavior. Even very subtle cues, such as pictures of eyes displayed nearby, can cause a person to give more money to his/her partner (Haley & Fessler, 2005), contribute more to an honesty box (Bateson et al., 2006; Hatszegi & Suranyi, 2011), or be more willing to follow a set of instructions (Ernest-Jones et al., 2011). The effect of eye-related cues on cooperation may even be more powerful than written messages that are irrelevant to the cooperative behavior itself (Ernest-Jones et al., 2011).

Laboratory and field experiments with subtle visual cues have suggested that it is not the immediate presence of other people that enhances cooperation (Bateson et al., 2006). From an evolutionary perspective, humans have become extremely sensitive to eye cues as a result of natural selection. Indeed, neuroscientific research has found that specific neurons in the brain are activated only when people see images of eyes (Emery, 2000; Haidt, 2001). Aside from humans, other animals also show a predominant interest in eyes.

Some species of butterflies and moths, for instance, have even evolved eye spots on their wings to deter potential predators (Emery, 2000). Thus images of eyes motivate cooperative behavior because they induce a perception in participants of being watched (Bateson et al., 2006). The presence of eyes facing in one's direction provides a direct indication that one's actions are being observed (Haley & Fessler, 2005).

Cooperation directed at non-kins has received the attention of psychologists and sociologist, but only four studies have examined the nature of stimuli that influence cooperation. In a study where participants had the possibility to pay for tea or coffee via an honesty box, payments for drinks were three times as much when eyes were displayed than when flowers were displayed (Bateson et al., 2006). In a similar study conducted in Hungary, money put into an honesty box was 25% more when eyes expressing emotions of anger and happiness were displayed compared to when neutral eyes were displayed (Hatszegi & Suranyi, 2011). In another study, when eyespots were shown on the background of the computer, almost twice as many participants gave money to their partners (Haley & Fessler, 2005). Moreover, the effect of eye cues has been shown in both the research laboratory and the field. A recent field study, for instance, showed that a picture display of eyes in a university cafeteria caused a significant decrease in participants' littering behavior (Ernest-Jones et al., 2011). These studies examined how eye-like symbols influence cooperative behavior, but none considered the race of eyes. Moreover, the eye cues used in previous studies differed from one another in a variety of ways, which makes the results difficult to interpret.



Racial Characteristics of Eyes

Race — a socially constructed characteristic that is automatically encoded by the brain (Ito & Urland, 2003; Van Bavel & Cunningham, 2009) — is rather difficult to ignore, particularly in racially stratified societies (Steck, Heckert, & Heckert, 2003). More importantly, humans have been found to be especially fast at detecting faces belonging to other races (Brebner, Krigolson, Handy, Quadflieg, & Turk, 2011; Donders, Correll, & Wittenbrink, 2008). For instance, Levin (2000) found that Whites tend to detect Black and Asian faces in an array of White faces faster and easier than they do in detecting a White face in an array of Black or Asian faces. This ability can be explained by the tendency of other-race faces to simply "stand out" from faces belonging to one's own race (Kubota & Ito, 2007; Levin, 2000). Arguably, greater attention given to more distinctive and novel stimuli is adaptive because these stimuli could have potentially negative implications for the self (Carretie, Mercado, Tapia, & Hinojosa, 2001). Indeed, Ito and Urland (2005) found that, among White participants, Black faces elicited greater attention and larger activation in certain areas of the brain than White faces (Kubota & Ito, 2007). However, increased attention to Black faces was attenuated when the face displayed clearly positive and non-threatening expression (Kubota & Ito, 2007).

However, not only do Whites show faster attention to Black faces than White faces, they also tend to categorize Black faces faster than White faces (Kubota & Ito, 2007). On the other hand, the frequency with which people encounter other races can also affect their level of attention to these races. Levin (2000) argues that, in contexts where White faces are more prevalent, the lower contact individuals have with Blacks, the better they

are able to discriminate Black faces. Indeed, within a predominantly White setting, youths from Black, Hispanic and Asian backgrounds tend to experience more discrimination and racial harassment (Goosby & Walsemann, 2012).

The Present Study

The aim of the present research was to investigate how race-related eye cues affect cooperative behavior in a Taiwanese context. Past studies suggested that people donate more at the direct sight of a pair of eyes, because they feel they are observed. Past studies examining the link between eye-cues and cooperation, used pictures of eyes expressing different emotions, but according to our knowledge none of the past studies examined the effect different race cues of eyes has on pro-social behavior. Changes in racial composition of many societies during the twentieth century suggest that examining individuals' response to emotions alone is not enough, and the features of shifting demographics should also be considered (Annisette, 2003). Because of this 'multiculturalism', encounters with people of other races are becoming more frequent, and understanding this phenomenon is at least as important as understanding how cues of different emotions affect cooperative behavior.

For the present thesis, first, we conducted a pilot study to standardize the race eye cues used in the main studies. In Study 1, we observed the relationship between cooperation and eye cues in a Taiwanese college dormitory. The same relationship was examined in a more controlled research environment in Study 2.

The use of standardized eye cues addresses flaws in research design that plagued previous studies in this area. For instance, the eye cues used in past research differed

from one another in numerous aspects, including angle of gaze, emotionality, as well as attractiveness (see Appendix A). These differences could have seriously confounded the results obtained. Orientation of the head signals how much attention is being directed at the subject (Emery, 2000) — that is, how much one is being observed by others. Even animals such as jewelfish, various birds and wild house mice show a tendency to avoid two schematic horizontal eyes more than pairs of eyes presented in a vertical orientation (Emery, 2000). Previous studies also suggest that attractive pictures tend to capture more attention than unattractive ones (Rubenstein, Kalakanis, & Langlois, 1999). Finally, there is neuroscientific evidence indicating that eyes expressing emotions are encoded differently than eyes that are emotionally neutral (Adolph, 1999). Thus different types of eyes attract people's attention in different ways.

The Asian context of the present research is different from the more familiar UK and US contexts of past eye-cue studies, where traditionally the society has privileged White Americans and where Blacks and Asians are considered ethnic minorities (Annisette, 2003; Steck et al., 2003). The present thesis extended previous research on eye cues and cooperative behavior to race in an Asian context, controlling for angle, attractiveness and emotionality of the eyes. In the present study Asian eye cues constituted the same-race or ingroup eye cues. To be able to generalize on the salience of out-group cues of eyes, pictures of eyes of both a Black and White persons were used. Based on previous theory suggesting how faces belonging to outgroup members better "stand out", because of their distinctive character (Kubota & Ito, 2007; Levin, 2000), we predicted that outgroup eye

cues (i.e., White and Black) would elicit more cooperative behavior compared to ingroup eye cues (i.e., Asian).

Pilot Study

To avoid confounds due to differences in the quality of visual cues, we conducted a pilot study to select images (i.e., Asian eyes, Black eyes, White eyes, and flowers) that were equivalent in angle, emotionality, and attractiveness. This is particularly important in research involving race, because previous research suggests that the faces of White females are generally perceived as more attractive than the faces of Black females (Lewis, 2011), and that facial expression can influence the categorization of racially-ambiguous faces (Hugenberg & Bodenhausen, 2003). Additionally, we wanted to make sure that the eyes were perceived to belong to the race they were supposed to represent. In honesty-box situations, participants have the chance to purchase a product, which in is usually food or drink. Besides selecting the right eye cues, the aim of the present pilot study was to learn what type of snacks Taiwanese participants prefer, to be able to use their most favorite snacks in the follow-up Study1.

Method

Participants. 34 Taiwanese students from National Taiwan University participated in the pilot study. Their ages ranged from 20 to 25 years (M = 21.58, SD = 1.37). One participant was excluded because she was already familiar with our study, leaving a total of 20 females and 13 males.

Procedure. In the first part of the pilot, participants viewed 12 images of eyes and 4 images of flowers on a large classroom projector screen. These images were either taken by the first author, downloaded from the internet for free, or bought from internet photo sites. We had 4 images of eyes for each race (i.e., Asian, Black and White) that displayed

eyes, eyebrows, and forehead (Bateson et al., 2006; Ernest-Jones et al., 2011). To avoid differences in angle of gaze, all of the eyes were looking straight ahead. We selected only female eyes because there were more quality high definition images of female than male eyes available. First, participants were asked to rate each image on level of attractiveness. Attractiveness of each image was assessed via three items that were rated on a 7-point Likert-type scale (-3 = strongly disagree; 3 = strongly agree): (1) "I believe this picture is attractive"; (2) "I believe others would like this picture"; (3) "I like this picture". For the eyes, participants also made evaluations pertaining to emotionality and race. Emotionality and race were assessed using a single item: "This picture does not express any emotion" and "This picture is representative of the race Asian/Black/White", respectively. Participants also rated these items on a 7-point Likert scale (-3 = strongly disagree; 3 = strongly agree).

In the second part of the pilot, participants evaluated 6 kinds of snacks in terms of value and appeal. For snacks, we asked participants to evaluate 4 kinds of chocolates and 2 kinds of gelatin desserts. The questions they had to answer about the snacks include: (1) how much they would pay for one piece; (2) how willing they would be to buy a piece if the cost per piece is 10, 12 and 15 NT, respectively; and (3) which snack they would buy if they can only make one choice[1].

Results

Based on participants' ratings, we selected three images of eyes and one image of flowers that were as similar as possible to serve as the visual cues for the main studies (See Appendix B).

Results from repeated measures ANOVA showed that these images were indeed equivalent. Because three attractiveness items were highly correlated, they were aggregated into a composite score. Cronbach's alpha for the attractiveness composite was .86, .87, .90, and .87 for the Asian, Black, White and flower images, respectively, suggesting high internal consistency (Kline, 2005). There were no outliers as assessed by inspection of a boxplot, and the data were normally distributed in each picture condition, Shapiro-Wilk's test ($p > .05$). Mauchly's Test of Sphericity indicated that the assumption of sphericity had not been violated, $\chi^2(3) = 3.23$, $p = .67$, df = 3, N = 33, thus the variances of the differences between all combinations of related groups were equal. There were no statistically significant differences in level of attractiveness across the four images, $F(3, 96) = 1.40$, $p = .25$, partial $\eta^2 = .04$, with means of .42, .73, 1.67, and 2.21 for Asian, Black, White, and flower, respectively.

In the same way, there was no significant difference between the level of emotion expressed by the three eye pictures, $F(2, 64) = .56$, $p = .57$, partial $\eta^2 = .02$, with means of 1.03, .76, and .73 for Asian, Black, and White, respectively. As assessed by inspection of a boxplot and Shapiro-Wilk's Test, there were no outliers, the data were normally distributed, and the assumption of sphericity was not violated, Mauchly's Test $\chi^2(2) = 1.04$, $p = .59$, df = 2, N = 33.

Moreover, the three eye pictures were rated as highly representative of their race (means = 2.52, 2.76, and 2.73 for Asian, Black, and White, respectively). Because Mauchly's Test of Sphericity indicated that the assumption of sphericity had been

violated, $\chi^2(2) = 6.06$, $p = .04$, df = 2, N = 33, a Huynh-Feldt correction was applied ($\varepsilon = .85$). There was no significant difference between the level in which the different pictures represented these races, F (2, 64) = 2.87, $p = .07$, partial $\eta^2 = .08$. Moreover, the pictures were seen as not at all representative of the other two races (mean = -1.82, -1.91, and -2.51 for Asian, Black, and White, respectively).

Among the snacks options, *Ferrero Rocher* was the most preferred. 30.3% of the students selected it as their top choice. More students were willing to buy it for 10 NT (*Mdn* = 2), compared to 12 NT (*Mdn* = 1) and 15 NT (*Mdn* = -1), χ^2 (3) = 36.6, $p < .001$, df = 3 , N = 33.

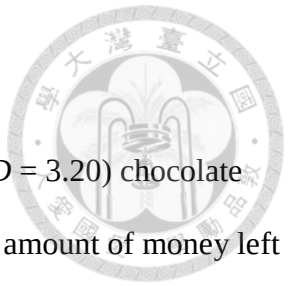
Study 1

In this study, we examined how the race of eye cues affects cooperation in a real-world setting. The money-box paradigm, also known as the honesty-box or honor-box paradigm, was used. In this paradigm, people can take whatever product they want and pay for it by putting money into a money box (Bateson et al., 2006; Ernest-Jones et al., 2011; Hatszegi & Suranyi, 2011). Even though these situations are usually risky for sellers because people can pay less than what the product is worth, they are useful for examining the link between eye cues and cooperation.

Method

Participants. Students living in one of the dormitories at National Taiwan University were potential participants in this study. This dormitory is spread out across 4 big buildings and serves about 600 students.

Procedure and materials. The experiment was conducted over 4 consecutive weeks. We set up two counters— one in the activity hall and the other in the kitchen area of the dormitory— that offered participants the opportunity to purchase pieces of Ferrero Rocher chocolate and pay for them via a money-box. The chocolate pieces were placed on a table, together with a poster above that displayed the price of a chocolate piece (10 NT) and one of the four visual cues (see Appendix B and C). One visual cue was posted each day. To eliminate potential bias due to order effect, the cues were randomized within each week during the four-week period, with each type of eye cue appearing for one day during any given week.



Results

On an average, participants in the study have consumed 4.50 (*SD* = 3.20) chocolate pieces per day. In order to test our hypothesis, we recorded the total amount of money left in the money box at the end of each day[2]. As assessed by the Shapiro-Wilk's test, the amount of money given for each chocolate piece was not normally distributed for either the Asian condition ($p < .001$, *Mdn* = 10, *SD* = .20, *SE* = -2.27), the Black condition ($p < .01$, *Mdn* = 9.81, *SD* = 1.17, *SE* = -2.20), the White condition ($p < .01$, *Mdn* = 10, *SD* = .73, *SE* = -2.45), or the Flower condition ($p < .001$, *Mdn* = 10, *SD* = 4.01, *SE* = -2.07). Hence a non-parametric test was used (Davis, 2013). The Kruskal-Wallis test showed no statistically significant difference across the four conditions in the amount of money paid for each chocolate piece, $H(3) = 1.83$, $p = .63$[3].

We also ran a Mann-Whitney U test to determine if there were differences in the money paid between the Asian condition and the aggregated other-race conditions. There was no statistically significant difference between Asian and the aggregated Black and White conditions, $U = 25$, $z = -.654$, $p = .51$. Finally, the amount of money paid across the three eye cue conditions was aggregated, and a Mann-Whitney U test was run to compare eye cues more generally to flower cues. Results indicated that the amount of money paid was not significantly different between the eye conditions and the flower condition, $U = 45$, $z = -.52$, $p = .27$.

Discussion

In Study 1 we used the money-box paradigm to examine the link between race of eye cues and cooperative behavior. Results of the study indicated that different race cues

elicited the same level of cooperation. Furthermore, the presence of eye cues did not increase cooperation in a Taiwanese context compared to a flower cue. However, Study 1 was a field experiment. Even though field experiments sometimes provide results that might be closer to reality, a major shortcoming of this type of research design is that variables cannot be tightly controlled, making it much more difficult to draw causal inferences. To address this issue, and to further examine how the race of eye cues influences cooperative behavior, Study 2, a laboratory experiment that is subject to fewer confounding factors, was conducted.

Study 2

Paradigms involving anonymous games have been used in past research focusing on eye cues and cooperation (Haley & Fessler, 2005; Shalvi, Dana, & Handraaf, 2011); Shalvi et al., 2012). In Study 2, we asked participants to play the die-under-cup game, in which a dice was privately rolled several times in a small cup. Similar to Study 1, participants were indirectly expected to act in line with the rules of the study — that is, they had to be "cooperative participants" (Kollock, 1998). Specifically, participants had to report a certain roll to determine the reward they would receive, and the research design assured that their rolls would remain completely anonymous. As noted by Fischbacher and Heusi (2008) the die-under-cup game is ingenious because: (1) the distributions of different conditions can be compared to the true distribution of the outcome under full honesty; and (2) because the procedure ensures privacy and anonymity, reducing demand characteristics and therefore making it easier to observe dishonest behavior in an experimental setting.

Method

Participants. One hundred twenty-three students (65 females, 57 males, 1 person declined to state his/her gender) from National Taiwan University participated in this study. The mean age was 20 years (*SD* = 1.77; range: 18-28 years). 11 participants were excluded because they were not Taiwanese. In addition, 1 participant did not report the outcome of the first roll within the time limit, 1 failed to follow the instructions, 1 already heard of this study, and 3 encountered internet connection problems during the

experiment. This left us with a final sample of 106 participants (51 male, 54 female, one unknown).

Procedure. Upon arrival, participants were seated in the laboratory with a paper cup and a six-sided die. To enhance privacy to the fullest extent, students were seated in a computer lab where vertical desk-dividers separated each individual from the other participants. Moreover, the hole in the paper cup was as small as a coin, and it was not possible for anyone except the participant to know the outcome of the dice roll. Once seated, students had no direct contact with one another, and it was impossible for the experimenter to see the display of their computers and note the actual result of their rolls. Before starting the die-under-the cup game, the experimenter did a short demonstration by placing the dice in the cup, shaking it, checking the outcome, rolling it at least two more times, and typing the result of the first roll into the computer. Participants had 20 seconds to complete the task.

Participants were explicitly asked to roll their dice at least two times to make sure that the die was fair – that it was a regular six-sided die, and that it was not fixed to the cup. A computer program designed by experts in informatics was used to present the visual cues. Specifically, eye or flower cues appeared on the computer desktop wallpapers based on random assignment.

Verbal instructions delivered by the experimenter and written instructions displayed on the computer also contained relevant information about the rules of the game: (a) a portion of the research participants will be chosen to receive their payoff once the study is complete[4]; (b) payoff is determined by the first roll; (c) the amount of payoff is based

on the number indicated by their roll multiplied by 50 (a roll of 1 = 50 NT, a roll of 2 = 100 NT, 3 = 150 NT, 4 = 200 NT, and so on). After the game ended, participants completed a survey containing demographic questions about their age, gender, father's and mother's education, family economic situation, and frequency with which they encounter White and Black people in everyday life (see Appendix F).

Results

Preliminary analyses. We examined whether the likelihood of cheating varied according to the demographic background of participants. Correlations between the reported roll and the demographic variables (i.e., age, gender, father's and mother's education, felt economic pressure in the family) were small and statistically non-significant. The highest absolute correlation was obtained for felt economic pressure in the family ($rs < .14$, $ps > .16$). Thus, there was no need to control for any of the demographic variables in the main analyses.

According to participants' report, they encountered White people ($M = 2.97$, $SD = 1.63$) more frequently than Black people ($M = 1.67$, $SD = 1.00$). The frequency with which participants encountered Black and White people were not normally distributed, as assessed by the Shapiro-Wilk test ($p < .001$ for both races), thus the non-parametric Wilcoxon Signed Rank Test was used. This test determined that there was a statistically significant difference between the frequency with which participants encountered White ($Mdn = 3$, $M = 2.97$, $SD = 1.62$) and Black people ($Mdn = 1$, $M = 1.67$, $SD = 1.00$), $z = -7.58$, $p < .001$.

Main analyses. Under the die-under-cup paradigm, lying occurs when a participant reports a number different from the number of the first die roll. Using a non-parametric test, we compared the observed distribution of the reported roll outcomes under all four conditions with the uniform distribution. The distribution of reported rolls was negatively skewed and differed significantly from the uniform distribution (*Mdn* = 4, *M* = 3.67, *SD* = 1.85), Kolmogorov-Smirnov $Z = 2.331$, $p < .001$, suggesting that participants in Study 2 cheated more than what was predicted by chance. Across the conditions, the actual distributions were different from the uniform distribution for Asian eyes (*N* = 27, *Mdn* = 4, *M* = 4.26, *SD* = 1.56, Kolmogorov-Smirnov $Z = 1.96$, $p < .01$), Black eyes (*N* = 27, *Mdn* = 2, *M* = 3.04, *SD* = 2.09, Kolmogorov-Smirnov $Z = 1.92$, $p < .01$), but not for White eyes (*N* = 26, *Mdn* = 3.5, *M* = 3.54, *SD* = 1.75, Kolmogorov-Smirnov $Z = .941$, $p = .30$).

If other-race cues (in this case, Black and White eyes) stand out easier and faster than same-race cues (in this case, Asian eyes), same-race cues should result in less cooperative behavior than other-race cues. The Mann-Whitney significance test partially supported our hypothesis. Participants who were exposed to Asian eyes (*M* = 4.26) lied significantly more than those who were exposed to Black eyes (*M* = 3.04), Mann-Whitney $U = 240.5$, $p = .01$. Even though Asian eyes (*M*=4.26) elicited lower cooperation (more cheating) than White eyes (*M* = 3.54), this difference did not reach statistical significance, Mann-Whitney $U = 269.5$, $p = .07$. There also was no significant difference between participants who were exposed to White eyes (*M* = 3.54) and those who were exposed to Black eyes (*M* = 3.04), Mann-Whitney $U = 293$, $p = .30$. Comparing all races to the

flower condition, we found no difference between the amount participants lied in the flower condition (N = 26, Mdn = 4, M = 3.85, SD = 1.91) compared to the Asian condition (Mann-Whitney U = 313, p = .25), the Black condition (Mann-Whitney U = 269, p = .07), and the White condition (Mann-Whitney U = 302, p = .25).

As for how conscious students were of the eye cues, out of the 80 participants assigned to one eye-condition, 24 students (30.4%) noticed that there were eyes on the screen, 69.7% of participants could not remember that the computer desktop except instructions also featured eye pictures. [5]

Discussion

A laboratory experiment which is subject to fewer confounding factors was used in Study 2 to further examine how the race of eye cues influences cooperative behavior. We found that students cheated more than expected by chance for the Asian and Black conditions, and that participants showed greater cooperation when a Black eye cue was displayed compared to when an Asian eye cue was displayed. The cue of White eyes also elicited greater cooperation than Asian eyes, but this difference did not reach statistical significance. Finally, in contrast to past studies, Study 2 showed no difference between the flower cue and the eye cues in the level of cooperation elicited.

General Discussion

Previous research on the relationship between cues of eyes and cooperative behavior only focused on the use of eye-like drawings (Haley & Fessler, 2005), or eyes expressing different emotions (Bateson et al., 2006; Ernest-Jones et al., 2011; Hatszegi & Suranyi, 2011). Little is known about the role that eye cues of different races may play in cooperation. To address this issue, we conducted a field study and a laboratory experiment that compared the effects of Asian, Black, and White eye cues on cooperative behavior among Taiwanese. Based on previous theory suggesting that other-race faces better "stand out" than same-race faces (Levin, 2000), our main hypothesis was that cooperation is more likely when other-race eye cues are displayed compared to when same-race eye cues are displayed. Before running the main studies, a pilot was conducted to make sure that the visual cues used were as similar to one another as possible.

The experimental method of Study 1 did not differ from the paradigm used in three previous studies. Yet we found that participants' behavior did not change significantly according to the type of visual cue present. In Study 2, a controlled laboratory paradigm was applied using the same visual cues as Study 1. With fewer confounding factors, the experimental results indicated greater cooperation among participants when Black eyes were displayed compared to when Asian eyes were displayed. Moreover, the level of cooperation elicited by White eyes was situated in the middle between the level of cooperation elicited by Black and Asian eyes, suggesting that within the salience of other race cues, less frequently encountered eye-cues might be able to induce more cooperation[6]. Indeed, participants' self-report showed that Taiwanese do encounter Black

people less frequently than they do White people. Less frequently encountered stimuli (e.g., Black eyes) can become more distinctive and stand out better than more frequently encountered stimuli (e.g., White eyes), curtailing individuals' likelihood of cheating. If we compare the means of the three races we can notice how participants in the study tend to cheat more in the Asian condition, a little less in the White condition and the least in the Black condition.

Interestingly, both studies suggested no difference between eye cues and flower cues in their effects on cooperative behavior. This is in contrast to findings from past studies. For instance, participants in Bateson et al.'s (2006) study paid almost three times as much on days when eye cues were present than on days when flower cues were present. Even though participants in Study 2 who encountered eye cues showed a slightly lower level of cheating than participants who encountered the flower cue, the difference did not reach statistical significance. In the light of what it is already known, these results suggest that the effect of eye cues on cooperative behavior may not be the same across cultural contexts. One possible explanation for why our studies yielded data different from those obtained by past studies could be that the eye cues we used were different in attractiveness or other important aspects from previous studies. A second possible explanation might be related to differences in population density between Taiwan and the other countries where similar studies have been conducted. Most previous studies were conducted in the United Kingdom and Hungary, places where population density in December of 2013 was 263 capita and 110 capita per square kilometer, respectively (The World Bank, n.d.). According to statistics of the Directorate General of Budget,

Accounting and Statistics released in April 2014, population density of Taiwan is 632 capita, the second highest in the world among countries with a population of at least 10 million. Taipei and Kaohsiung have the highest density, with 10,000 people per square kilometer (Taipei Representative Office, n.d.). Higher population density increases the likelihood of physical and social contact and exposure to eyes more specifically. In other words, eyes are familiar rather than novel stimuli in densely populated areas. If there is greater attention oriented towards novel stimuli as suggested by Carretie et al. (2001), subtle eye cues displayed in densely populated area should attract less attention than in a less populated area.

Implications and Contributions

The present study is new in nature, because while it used similar research paradigms as previous studies, it added to the empirical literature by directly examining the effect of race cues on cooperation.

The results of the present study have practical implications in domains such as business, social work, advertisement and law, and fundraising and volunteering programs. For instance, encouraged by the results of Bateson et al. (2006), the police in West Midlands distributed posters containing eyes and the words: "We have our eyes on criminals" in places with high crime rates. This action helped the police reduce delinquency. The results of the present study indicates, that in Taiwan using stimuli or symbols resembling Black eyes might significantly increase the effectiveness of crime prevention programs. However, it seems that eye cues in general may exert less influence

in Taiwan than in other cultural contexts, since our study found little evidence of differences in cooperative behavior when eye cues were used in place of flower cues.

Limitations and Future Directions

Although the current set of studies is the first attempt at examining the effects of race cues on cooperative behavior, our finding still need to be interpreted with certain methodological and theoretical limitations in mind. Study1 and Study2 had a number of limitations, which should be addressed in the future. For instance, our research samples consisted of undergraduate students from a prestigious public university in Taiwan, and thus the results may not generalize to individuals from other age, socioeconomic, and cultural backgrounds. In Study1, for example, the location of the experiment was a dorm complex situated outside the university campus, where prices of the rooms were a little more expensive than regular dorm prices. Students living there were probably fairly well-off financially, and thus it is possible that they were more willing to pay for the chocolate pieces. Another limitation stems from our research design. Having a control group without any pictures at all should also be considered in future studies. Similarly, only female eye-cues were used throughout this research. In the future, studies could consider including pictures of both genders. In future field research studies the amount of money and the type of snack used could be also be manipulated. For instance, a price could be chosen by the future experimenter which is not round, or which is above market value. Individuals might be more willing to pay for something they like more, thus in the future a type of snack could be chosen, which are not Taiwanese students' favorite snacks.

Whether the lack of difference in effects on cooperative behavior between the eye and flower cues was due to cultural differences in the meaning of these cues within the Eastern and Western culture, or because the stimuli used during past studies diverged from those used in the present one in some systematic way, needs to be addressed too.

We expect future studies to shed light on how exactly more distinctive pictures of eyes increase cooperation, or what type of relationship exists between distinctiveness and the repeated exposure to an initially new stimulus, also called *familiarity* (Antonius et al., 2013). Since greater attention is given to more distinctive stimuli (Kubota & Ito, 2007; Levin, 2000), it is possible that salience of eyes do not necessarily need to be manipulated by race. As pointed out by Wiese, Altmann & Schweinberger (2014), distinctiveness affects memory accuracy, causing people to remember more distinctive faces particularly well. It would be very interesting to see, weather distinctive cues also effect self-awareness, for instance.

Conclusion

According to past studies, eye cues present in humans' social environment have a strong effect on cooperative behavior. Even though in multiculturalist societies of the twenty-first century, encounters with people of other races are more frequent than ever, none of the past studies have evaluated how race cues of eyes influence individuals' cooperative behavior. The present study aimed to extend past research by examining how race cues of eyes encourage cooperative attitude in a Taiwanese context. Finding from the present study suggested that compared to Asian eyes, cues of Black eyes may enhance cooperative behavior among Taiwanese. We hope that future research will explore how race cues of eyes function in other societies and cultural contexts, in order to understand cultural similarities and differences in the effects of such visual cues on important aspects of human behavior.

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Footnotes

[1]Both chocolate and gelatin are popular snacks among Taiwanese college students. The actual market value of these snacks varied between 15 NT in stores and 10 NT in malls when bought in sets.

[2]During the last week of the experiment, the counters were disassembled without prior consent or notification. For this reason, only results from the first three weeks were analyzed.

[3]Compared to means, medians of non-parametric data are less sensitive to outliers (Davis, 2013).

[4]In two earlier dice-under-cup studies (Shalvi et al, 2011a; Shalvi et al., 2011b) all participants could earn in extra money based on the number they reported, whereas in a more recent study subjects were told that *a number of participants* would be chosen randomly to receive pay according to their reports (Shalvi et al., 2012). The latter study confirmed that the number of participants rewarded had no effect on dishonest behavior. Thus, at the end of Study 2, we randomly chose two students for the reward.

[5] An independent sample t-test showed identical results as the non-parametric test in terms of significance. There was a significant difference in the reported rolls between the Asian and Black condition ($t = 2.48$, $p = .016$), and no significant difference between the Asian and White condition ($t = 1.58$, $p = .12$).

[6]According to past research (Shalvi et al., 2012), memory of the roll does not undermine the validity of the experimental design. For example, in Shalvi et al. (2012), 92% of the participants remembered the result of the first throw correctly. This ruled out

the possibility that some participants might have forgotten or misremembered the outcome of the first roll.

Appendices

Appendix A.

Pictures of eyes used in previous studies. Notice how they feature different emotions, gaze directions, and are different in quality and aesthetic impression (from left to right: Bateson et al., 2006; and Ernest-Jones et al., 2011).

Appendix B.

The four pictures selected from the pilot study were same-size quality pictures, with neutral facial expression, similar attractiveness, and representative of their respective races (from top to bottom: Asian eyes, Black eyes, White eyes, and Flower).

Appendix C.

The money-box set up.

Appendix D.

First page of the program used in Study 2 where participants had to fill in the result of their first dice throw.

首先，請仔細閱讀說明。在你閱讀完畢後，點選下方的箭頭開始.

說明: 通過搖骰子的遊戲，你將有機會贏到錢。搖動骰盅，讓骰子任意滾動，並透過小孔觀看得到的點數。

如何完成這個任務:

1、 搖晃骰盅，查看點數。
2、 搖晃骰盅至少兩次以上，且查看點數，以確保骰子是公正的。
3、 輸入第一次搖骰子的結果，得到你的報酬。

注意: 你將有 20 秒的時間去完成這件事。如果沒有在 20 秒內完成，參與者將會出局。

報酬: 你的報酬將取決於骰子的點數，即根據你報出的骰子點數乘以 70 元新台幣。如果你擲一顆六面的骰子，你可能的點數是 1、2、3、4、5 或 6。

你可能的情況是:

1 點將獲得 70 元新台幣 (1×70=70);
2 點將獲得 140 元新台幣(2×70=140);
3 點將獲得 210 元新台幣(3×70=210);
4 點將獲得 280 元新台幣(4×70=280);
5 點將獲得 350 元新台幣(5×70=350);
6 點將獲得 420 元新台幣(6×70=420)

你們當中有一些人將被隨機選中，並根據報出的點數，獲得報酬。

你已經仔細閱讀並且了解說明的含義，請按下面的箭頭開始遊戲。

下一頁

Appendix E.

Second page of the program used in Study 2 where participants had to fill in the result of their first dice throw.

20,19,18,.....1.

1、搖晃骰盅，查看點數。

2、搖晃骰盅至少兩次以上，且查看點數，以確保骰子是公正的。

3、輸入第一次搖骰子的結果，得到你的報酬。

Appendix F.

Survey containing demographic questions.

基本資料

（1）名字：

（2） 受試者編號：

（3）年齡：

（4）性別：

（5） 出生地：

（6） 您父親的最高學歷是？

□小學沒畢業或沒有上過學 □國小畢業 □國中 □高中/職 □專科 □大學 □碩士 □博士

（7） 您母親的最高學歷是？

□小學沒畢業或沒有上過學 □國小畢業 □國中 □高中/職 □專科 □大學 □碩士 □博士

（8） 您的家庭月所得大約是：_____萬

（9）您身上所負擔的家中經濟壓力

1	2	3	4	5	6	7
很少						很多

（10）您每個月從家中獲得的零用錢：_____

（11）您每個月自己打工獲得的錢：_____

（12）你一個月內碰到西方人的頻率是多少？

1	2	3	4	5	6	7
很少						很多

（13）你一個月內碰到黑人的頻率是多少？

1	2	3	4	5	6	7
很少						很多

（14）你一第一次搖骰子的結果是什麼？_____

（15）請問在電腦熒幕上面除了問題您還看到了什麼？

_____

_____

_____

_____

_____