

Culture's Influence on Attention to High and Low Arousal Positive Affect

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Abstract

Previous research has shown that there is a difference between ideal affect and actual affect. While ideal affect is more heavily influenced by cultural factors, actual affect is influenced more by temperamental factors. In the current cross-cultural study, high-arousal positivity (HAP) and low-arousal positivity (LAP) were studied to determine if Americans and Hong Kong Chinese have different preferences in ideal positive affect. Eye-tracking technology was used to determine if individuals attend more to pictures of their preferred ideal affect (either HAP or LAP). Additionally, self-reported ideal preference was recorded. It was hypothesized that gaze pattern and choice preference would vary by culture, with Americans preferring HAP and Hong Kong Chinese preferring LAP. Results show a main effect of culture, indicating that Hong Kong Chinese have longer fixation durations than Americans regardless of arousal level. There was also a significant difference in choice preference with Americans preferring HAP expressions significantly more than Hong Kong Chinese.

Keywords: culture, ideal positive affect, high-arousal positivity, low-arousal positivity, eye-tracking

Culture's Influence on Ideal Positive Affect

Does culture impact our ideal affect? Do differences in ideal affect influence what one attends to? Past studies indicate that a discrepancy exists between what we want to feel (ideal affect) and what we do feel (actual affect; (Tsai, Knutson, & Fung, 2006)). Affect valuation theory postulates that differences in temperament along with various cultural factors alter how people perceive and interact with the world around them and may account for differences in affective experiences (Tsai, 2007). This theory has three main tenets: (1) there is a difference between ideal affect and actual affect; (2) culture influences ideal affect more than actual affect and temperament influences actual affect more than ideal affect; (3) people try to minimize the discrepancy between their actual affect and their ideal affect, which motivates specific mood-producing behavior (Tsai, Miao, & Seppala, 2007). Because people's ideal affect preferences vary, Tsai, Knutson and Fung (2006) focused on a distinction between high-arousal positivity (HAP), excited and enthusiastic emotions, and low-arousal positivity (LAP), calm and serene emotions. Using the affect valuation index, which measures levels of actual affect and ideal affect, results indicated that European Americans valued HAP more than Asian Americans, while Asian Americans preferred LAP more than European Americans (Tsai, Knutson, et al., 2006). This distinction is important in understanding the emotional goal states that cultures endorse.

Research shows that individuals try to minimize the discrepancy between actual affect and ideal affect (Tsai, 2007; Tsai, Levenson, et al., 2006; Tsai, Miao, & Seppala, 2007). Although individuals from different cultures have indicated similar emotions in

actual affect, the ideal affect aspired to differs (Tsai, Knutson, et al., 2006). To achieve the desired affect, individuals perform different mood-producing behaviors. Tsai (2007) found that choices in leisure activities, music preferences and drug use are all influenced by the ideal affect an individual aspires to attain. Therefore, the present study uses gaze tracking, assuming that one's gaze would tend toward their ideal arousal level.

It is theorized that East Asians value low-arousal positivity more than Westerners due to cultural standards for creating harmony, where the individual adjusts personal needs to meet the needs of the environment or the in-group (Tsai, Knutson, et al., 2006). Tsai, Knutson, et al., (2006) argue that in order to maintain harmony with the group, East Asians are more likely to show subdued emotions so as not to disrupt the group. Therefore, LAP is considered more ideal in such cultures where the individual adjusts to the group's preferences. In contrast, Westerners are encouraged to be self-expressive and to influence others to meet one's individual needs. Tsai (2007) states that individuals with 'influence goals' act on others in order to meet one's individual needs by convincing others to help. This active influencing increases physiological arousal, which causes preferences for HAP more than LAP. Cultural differences in ideal affect preferences are in part due to differences in adjustment goals versus influence goals (Tsai, Miao, Seppala, Fung, & Yeung, 2007). The goal one most frequently experiences in a culture affects the ideal level of arousal for a given situation.

A common explanation of cultural differences is the collectivistic versus individualistic distinction (Tsai, Levenson, & McCoy, 2006), which may also be a defining characteristic for emotion preferences such as HAP or LAP. Collectivist cultures include most East Asian countries that put the benefit of the group interactions

before individual needs; this is a more related or connected view. As seen in most Western countries, individualistic cultures emphasize individuals independent of the group. While these two terms are usually talked about in contrast to one another, both are present in every culture although one is usually more dominant than the other.

Studies on individualistic and collectivistic cultures have focused on numerous aspects that may differ based on individual or collective tendencies. For example, past research has shown that less collectivistic couples were more likely to display positive emotional behaviors. This study revealed emotional behavior differences in interpersonal interactions due to cultural exposure; European Americans showed more positive emotional behaviors and less negative than Chinese Americans based on six coders' ratings of emotional expression (Tsai, Levenson, et al., 2006). This finding is in accordance with the positive expressiveness perspective, which states that people from individualistic cultures tend to increase positive emotions and minimize negative emotions more so than people from collectivistic cultures (Tsai, Levenson, et al., 2006). Based on the positive expressiveness perspective, I theorized that Americans would prefer more expressive positive emotions found in HAP expressions in tasks requiring a choice of personal preference of arousal level.

While previous studies have included a range of negative and positive emotions of various arousal levels (Tsai, Knutson, et al., 2006; Tsai, Levenson, et al., 2006), the present study focused solely on positive affect. Therefore, this study assessed attention to enthusiasm and calmness through eye tracking for a more direct measure of attention, as well as a self-report measure of participants' preferred ideal affect. Pictures of the same valence but different arousal levels were used to determine a relationship between

cultural ideals in regards to HAP and LAP. Tsai (2007) suggests that ideal affect predicts mood-producing behaviors. To this effect, I investigated whether ideal affect can also predict gaze fixation patterns. Eye tracking allows for the nearly real time study of visual attention. Because visual attention can be linked to eye movements (Parkhurst, Law, & Niebur, 2002), this study allowed for a more direct observation than self-report alone allows. Differences in visual attention may indicate habitual reinforcement of cultural norms (Miyamoto, Nisbett, & Masuda, 2006). Similarly, different behaviors are performed to reach different ideal affects, which may include gaze patterns towards one's ideal (in this case, HAP or LAP facial expressions).

This research examined the ways in which focus indicates attention to different emotions; additionally, it investigated if one's chosen ideal preference corresponds to what we attend. Eye-tracking technology identified subjects' fixation on excited or calm faces. Through self-report participants electronically reported which emotion they would ideally like to feel, a tactic similar to that used in previous work (Tsai, Knutson, et al., 2006). By incorporating self-reported ideals, comparisons could be made between the self-report choice preference and gaze pattern. Through the self-report of ideal affect, it was possible to see if attention is indicative of one's ideal affect, as well as if the theorized cultural ideal matches what is attended. I hypothesized that gaze pattern and choice preference will differ by culture, with Americans looking longer and preferring HAP expressions more than Hong Kong Chinese.

Methods

Participants

For this study, 32 young adults from America ($M = 19.94$ years $SD = 1.65$, Female = 72%) were recruited from Brandeis University introductory psychology classes and an online Brandeis University classified advertisement. Participants received course credit or monetary compensation for their participation. Additionally, 30 young Chinese adults ($M = 20.32$ years, $SD = 1.22$, Female = 52%) were recruited from the Chinese University of Hong Kong. Dr. Helene Fung, Associate Professor of Psychology at Chinese University of Hong Kong is the director of the collaborating lab, and oversaw the study in Hong Kong.

Stimuli

Three types of photographic images (computer-generated synthetic faces, Facebook™ pictures and magazine advertisements) were used for the stimuli in the present study. Synthetic faces were used to depict positive emotional faces (Wilson, Loffler, & Wilkinson, 2002). These synthetic faces control for differences in visually distracting inconsistencies found in other real photographs, such as hair, wrinkles, skin tone, texture, lighting, etc. The emotional characteristics follow specifications for happiness, with both calm and excited stimuli taken from the range of ‘happy’ synthetic faces (Ekman & Friesen, 1975). The faces range in expressiveness on an 11-point scale, where 0 is the most neutral and 10 is the most expressive. Calm expressions represented the low end of the happy range, and excited came from the higher end of the spectrum, with more up turn around the mouth and eyes. Pretesting ensured that the chosen faces represented the appropriate emotion (calm or excited). Pairs of faces were chosen from the first pretest that resulted in a range of at least 4 degrees separation between the calm and excited expressions allowing for a clear distinction between the two. In the second

round of pretesting, raters determined whether faces, shown in a random order, showed excited, calm or neutral expressions. Resulting stimuli with the appropriate expression (calm or excited) were incorporated in the current study, resulting in seven matched pairs of synthetic faces.

Additionally, snapshot photographs of individuals' faces were used to enhance the external validity of the study. Through use of snapshots, participants may better relate to the stimuli, thus making their ideal affect preferences more realistic than the synthetic or magazine photographs. These photographs were collected with permission from the individuals on FacebookTM, a networking website where individuals frequently post pictures of themselves. The seven pairs of FacebookTM photographs were collected from individuals who do not attend Brandeis University or Chinese University of Hong Kong, so that participants would not recognize the individuals in the stimuli.

Lastly, a collection of HAP and LAP magazine advertisements was also incorporated into this study (Chim, Moon & Tsai, 2009). These faces include Western and Asian faces displaying both HAP and LAP expressions. There were eight pairs of magazine photographs, matched by race and then randomly paired by expression, so that Westerners with calm and excited expressions were matched, and similarly with the Asian images.

Stimuli were presented on the computer in HAP and LAP pairs within each type of stimuli. The presentation order and the arousal orientation (left or right) were randomized to counter potential order effects. Participants viewed both within-culture faces as well as out-group faces.

Equipment

For this study, an Applied Science Laboratories (ASL) Eye Tracker Model 504 was used in addition to GazeTracker software. Eye movements were recorded at 60Hz, with fixations defined as intervals where gaze is focused within a 1° visual angle for 100 ms or more within an area of interest (Manor & Gordon, 2003). The areas of interest (AOI) were the faces of the stimuli, excluding both the background of the pictures, as well as the presentation slide. Fixation duration ratios are the dependent variable, determined by the amount of time a participant fixates on the AOI compared to fixations anywhere else on the screen. Duration ratios were calculated by the duration in an AOI across all slides, divided by the total length of durations.

Additionally, fixation count ratios were calculated, taking the average fixation count for each arousal area (i.e. excited and calm) and dividing by the average number of total fixations.

Self-Report Measures

Self-reported choice preference for either the excited or calm face in each pair was also recorded on the computer. A choice preference ratio was calculated by dividing the number of times excited was chosen over calm stimuli by the total number of slides, therefore higher values indicate a greater preference for HAP.

Four questionnaires were used during the study (see Appendices A-D). First, a demographics questionnaire was used to gather background information from participants from both cultures. This questionnaire allowed for the comparison of two cultural groups. Second, the Emotion Regulation Questionnaire (Gross & John, 2003) measures an individual's tendency towards reappraisal or suppression when regulating one's emotions. Gross and John (2003) showed Cronbach alpha reliabilities of 0.79 for

reappraisal and .73 for suppression. This questionnaire was used to determine if regulation strategies correlated with fixation patterns.

The Self-Construal Scale (Singelis, 1994) was incorporated into this study to measure individuals' self-rated tendencies towards independence and interdependence. This questionnaire focuses on individual variability between independence and interdependence within a culture. The scale shows acceptable reliabilities, with Cronbach alpha scores for independent at 0.69 and interdependent at 0.73 (Singelis, 1994).

The Value Scale (Schwartz, 1994) was incorporated to measure participants' ratings on several universal values. The Schwartz Value Scale shows general reliability coefficients of 0.78 for Conservation and 0.72 for Self-Transcendence, these are the collapsed two-dimensions of the scale (Lindeman & Verkasalo, 2005). This questionnaire focuses on ten individual-level values (conformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, and security), as well as seven cultural-level values (embeddedness, hierarchy, mastery, affective autonomy, intellectual autonomy, egalitarianism, and harmony). Incorporating this questionnaire allowed for the study of both individual and cultural level values.

Procedure

Once participants entered the lab, they read and signed the informed consent form. Then participants completed three vision tests, including near-sighted, far-sighted and contrast vision tests. Next, participants filled out a brief demographics questionnaire (Appendix A) including questions on age, sex, religious affiliation, nationality, and length of time spent in the United States (or time spent in China for Hong Kong Chinese

participants), and the Emotion Regulation Questionnaire (Appendix B; Gross & John, 2003). Participants were then calibrated on the eye-tracker to record their gaze pattern during the stimulus presentation.

During the first stimulus slideshow, participants were instructed to watch the stimuli naturally as if at home watching television. Each pair of images was viewed for five seconds with a crosshair buffer slide presented in between each slide for 0.5 seconds. Next, participants viewed the pairs in a new randomized order and were instructed to indicate which face's emotion they would rather experience by pressing the left or right arrow key for the corresponding face.

Once all of the stimuli were presented, participants completed a questionnaire on self-construal (see Appendix C) to determine individual perceptions of independence versus interdependence within the individual (Singelis, 1994). Additionally, participants filled out a value scale (see Appendix D), focusing on the importance of certain values in one's life (Tsai, 2007). When participants completed all of the above tasks, they were debriefed and allowed to leave.

Design and Analysis

For this study a mixed between-within subjects analysis of variance was used to analyze the fixation ratio scores across culture and arousal level, this analysis was used to test whether culture and/or arousal level predicts fixation patterns. Additionally, an independent t-test was calculated for the choice preference data to determine whether the difference in self-reported preference was significant. Split data correlations were calculated to determine the relationships between the variables across culture.

Results

Two-tailed independent samples t-tests were performed on the self-report questionnaires. For the Emotion Regulation Questionnaire, the subscale suppression was significant, $t(60)=-2.56, p=0.01$. Hong Kong Chinese reported greater usage of suppression ($M=16.43, SD=4.32$) than Americans ($M=13.31, SD=5.20$). For the Self-Construal Scale, there was a significant difference between the two cultures in the independent subscale, $t(53.75)=15.62, p<0.01$; there was a significant difference in the interdependence subscale between the two cultures, $t(51.20)=9.40, p<0.01$. Americans reported higher independence and interdependence than Hong Kong Chinese (see Table 2). For the Value Scale only three of the ten individual values were found to be significant. Tradition was significant, $t(48)=2.07, p<.05$, with Americans valuing tradition more than Hong Kong Chinese ($M=0.21, SD=0.53$ and $M=-0.08, SD=0.46$, respectively). Self-Direction was valued more by Hong Kong Chinese ($M=-0.04, SD=0.45$) than by Americans ($M=-0.44, SD=0.54$); this was significant at $t(48)=-2.82, p<0.01$. Additionally, hedonism was significant at $t(48)=-2.67, p=0.01$, with Hong Kong Chinese valuing hedonism more than Americans ($M=-0.56, SD=0.61$ and $M=-1.09, SD=0.78$, respectively). For the adjusted cultural values, only the subscale intellectual autonomy was significant, $t(48)=-2.43, p<0.05$. Hong Kong Chinese valued intellectual autonomy ($M=3.75, SD=0.81$) more than Americans ($M=3.20, SD=0.76$).

A mixed between-within subjects analysis of variance was performed to determine if culture (American and Chinese) influences fixation pattern, as seen in the average duration of fixation ratios, across two levels of arousal (excited and calm). There was no significant main effect for arousal, Wilks Lambda = 0.95, $F(1,50) = 2.45, p > 0.05$, partial eta squared = 0.05. However, the main effect of culture was significant,

$F(1,50) = 12.3, p < 0.01$, partial eta squared = 0.2, indicating that culture does influence the average duration ratios (see Table 3). There was no significant interaction between culture and arousal, Wilks Lambda = 0.99, $F(1,50) = 0.61, p > 0.05$, partial eta squared = 0.01.

Two-tailed independent samples t-test was used to determine if there was a significant difference in the choice preference ratio across cultures. The mean choice preference ratio differed significantly, $t(60) = 4.81, p = 0.00$. The average choice preference ratio for Americans ($M = 0.75, SD = 0.12$) was significantly higher than the average choice preference ratio for Hong Kong Chinese ($M = 0.59, SD = 0.14$), where higher mean scores indicate a greater preference for excited faces. This supports the hypothesis that Americans prefer high-arousal positivity more than Hong Kong Chinese in this study.

Pearson correlations were performed to determine relationships between the excited duration ratio, the calm duration ratio, and the choice preference ratio separated by culture. There was a strong negative correlation for Hong Kong Chinese between the excited duration ratio and the calm duration ratio, $r = -0.81, n = 24, p < 0.01$, indicating that longer fixations in the HAP area are associated with shorter fixations in the LAP area. Additionally, there was a moderate positive correlation between excited duration ratio and choice preference in the Hong Kong data, $r = 0.55, n = 24, p < 0.01$. This indicates that higher excited duration ratios were associated with greater choice preference towards excited. There was also a moderate negative correlation between the calm duration ratio and choice preference among the Hong Kong Chinese, $r = -0.46, n = 24, p < 0.05$, with higher calm duration ratios associated with a lower choice preference ratio.

For the American data, there was a strong positive correlation between the excited duration ratio and the calm duration ratio, $r=0.74$, $n=28$, $p<0.01$. This indicates that higher excited duration ratios were associated with higher calm duration ratios. The correlation between excited duration ratio and choice preference was non-significant for the American data, $r=0.16$, $n=28$, $p>0.05$. The correlation between the calm duration ratio and choice preference was also non-significant for the Americans, $r=0.08$, $n=28$, $p>0.05$.

Pearson correlations were also performed on the self-report questionnaires and resulted in several significant correlations. Scores for suppression on the Emotion Regulation Questionnaire were negatively correlated with the Self-Construal Scale's interdependent variable in the Hong Kong data, $r=-0.48$, $n=30$, $p=0.01$, this indicates that the greater use of suppression is associated with less interdependence. This correlation was not significant in the American data, $r=-0.06$, $n=31$, $p>0.05$. For the Hong Kong Chinese suppression scores on the Emotion Regulation Questionnaire were negatively correlated with choice preference, $r=-0.42$, $n=30$, $p<0.05$. This correlation (which was non-significant in the U.S. data, $r=0$, $n=31$, $p>0.05$) indicates that greater suppression is associated with less preference towards excited (HAP) facial expressions. In the American data, independence scores on the Self-Construal Scale were positively correlated with choice preference, $r=0.43$, $n=32$, $p=0.01$, indicating that greater independence is associated with greater preference towards excited (HAP) faces (this correlation was not significant for the Hong Kong Chinese, $r=-0.22$, $n=30$, $p>0.05$). In regards to the Value Scale, benevolence was positively correlated with the excited duration ratio among Hong Kong Chinese, $r=0.46$, $n=20$, $p<0.05$, in contrast to

Americans $r=-0.14$, $n=21$, $p>0.05$. Therefore, greater benevolence is associated with greater excited duration ratios among Hong Kong Chinese. Benevolence was also positively correlated with choice preference among Hong Kong Chinese, $r=0.54$, $n=26$, $p=0.01$. This indicates that greater benevolence is associated with greater preference towards excited (HAP) faces among Hong Kong Chinese; this correlation was not significant in the American data, $r=-0.14$, $n=24$, $p>0.05$.

Discussion

The current study investigated cultural differences in gaze patterns and choice preference for excited and calm faces. The stimuli were chosen to represent high-arousal positivity and low-arousal positivity in order to determine if there are culturally distinct preferences for arousal level. This study showed several cultural differences between Americans and Hong Kong Chinese. The main effect of culture shows a significant difference in fixation durations, with Hong Kong Chinese fixating on the stimuli longer than Americans regardless of the arousal level of the stimulus. Despite Hong Kong Chinese fixating longer on high-arousal positive images, Americans' chose HAP (excited) images as their preferred ideal significantly more often than did the Hong Kong Chinese. In contrast to the original hypothesis, Hong Kong Chinese did not prefer LAP images more; both fixation duration and self-reported preference were higher for HAP images. These results suggest that Americans do prefer high-arousal positivity based on choice preference, but also that Hong Kong Chinese gaze longer at high-arousal positivity images.

Hong Kong Chinese may fixate longer than Americans because they're taking more of the image into account. Nisbett (2003) noted that Americans tend to focus on

foreground objects. Because the stimuli only had two central objects, Americans may not have fixated as long, whereas the Hong Kong Chinese may have fixated on more details.

The Hong Kong Chinese showed a strong negative correlation between excited and calm duration, this indicates that as participants spent more time looking at one arousal level they spent less time looking at the other. However, for the Americans this was a strong positive correlation, which may indicate that Americans looked equally at the two arousal levels or at the background. Despite their equal looking times, Americans reported greater preference for HAP. Tsai (2007) found that individuals participate in mood-producing behaviors that are likely to illicit their ideal affect, however in the present study gaze may not be a strong enough mood-producing behavior to accurately track individual's ideal affect as I had originally theorized. Since gaze is also used for information gathering it may not alter mood in this paradigm for Americans.

There was a moderate negative correlation among the Hong Kong Chinese between calm fixation duration and choice preference. This indicates that the longer participants fixated on the calm stimuli the less likely they were to prefer excited as their ideal. This fits the expected finding and shows that for Hong Kong Chinese gaze more accurately fits as a mood-producing behavior. This could be due to collectivistic tendencies to harmonize with the group and therefore prefer the emotion most looked at.

For Americans, gaze pattern was not significantly associated with choice preference. This may indicate that Americans' gaze does not match their ideal positive arousal level. There may be differences in the weight given to viewed stimuli. Americans looked at the stimuli less, but still indicated greater preference for HAP. Americans may not weight images with as much significance when passively viewing

them as expected. Therefore, when Americans were told to view the stimuli naturally, as if watching television, they may not have given specific meaning to either image while just gathering information from casual gazing, and thus looked at the two images in equal amounts. Only when asked to pick an image that expressed an emotion they would rather experience did they need to give meaning to an image.

Among the questionnaire results, the current study revealed that among Hong Kong Chinese suppression on the Emotion Regulation Questionnaire is negatively correlated with interdependence on the Self-Construal Scale. This moderate correlation suggests that greater suppression is associated with less interdependence, which may indicate that for Hong Kong Chinese interdependence does not benefit from greater levels of suppression. Suppression was also negatively correlated with choice preference for the Hong Kong Chinese; this suggests that greater suppression is associated with less preference for excited faces. Since HAP images express greater emotion, it follows that greater suppression scores would be associated with less preference for HAP.

For Americans, independence on the Self-Construal Scale was positively correlated with choice preference, indicating that independence is associated with greater preference for high-arousal positivity. This shows the connection predicted in the hypothesis that Americans would prefer the excited stimuli. The results from the American data support the findings of Tsai, Knutson, et al. (2006) however, the Hong Kong Chinese results do not show the preference for LAP that was found in previous work. The present study questions whether LAP preference is necessary for cultures with adjustment goals as suggested by Tsai, Knutson, et al. (2006).

Limitations

There were several limitations on the current study that may have influenced the results. Because there was no main effect for arousal-level, the stimuli may not have been different enough. Specifically with the synthetic faces, there were not clear markers of high-arousal positivity like smiling with teeth showing and deeper crinkles around the eyes. In pretesting with Americans, it was challenging to describe calm faces as something different than neutral, which may mean that Americans saw the low-arousal images as more neutral rather than positive. Due to the modest sample sizes, the results may not have been as robust. Additionally, subjects who have only lived in one country may have served as better representations of their respective culture, and therefore showed more extreme results. For future studies, I would recommend increasing the sample size in order to obtain more generalizations. Additionally, I would recruit subjects based on race/ethnicity, as well as percentage of time spent in their home country in order to obtain clearer examples of each culture. In creating the stimuli, images should be gathered and pretested in both cultures for a more balanced collection. Future studies may benefit from creating more concrete scenarios when asking participants which emotional expression they would rather experience. Because previous research suggests that LAP is preferred in order to adjust to a group (Tsai, Knutson, et al., 2006), participants may respond differently if asked which emotion they'd rather experience in a social setting.

Implications

Understanding cultural preferences in ideal affect can help in recognizing different standards of behavior. This work may be especially important in understanding mental health across cultures, as shown in Tsai, Knutson, et al., (2006) discrepancies

between ideal affect and actual affect accounts for a significant amount of variance in depression. Recognizing differences in ideal affect may help in giving culturally sensitive care for depression. If a client from a different cultural background has a different ideal affect, such as someone from Hong Kong preferring LAP, it is important for his or her caregiver to aim treatment at achieving that ideal state.

This study may also be beneficial for persuasive marketing purposes. Recognizing one's target group's interests and what they attend to is important for effectively marketing a product. Based on the present findings, advertising for Americans should be focused on high-arousal positivity because choice preference significantly favored excited expressions. For Hong Kong Chinese, high-arousal positivity will attract more attention in gaze patterns, however there was no significant favoritism towards either excited or calm expressions.

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Table 1: Demographics by culture

	US		Hong Kong	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	19.94	1.65	20.32	1.22
% of life spent in country of testing	79.65	33.08	78.9	37.86
Sex	Female = 72%		Female = 53%	
Race	Caucasian = 56%, Asian = 37.5%		Chinese = 100%	
Religion	Jewish = 43.8%, Christian = 25%, None = 25%		Christian = 23.3%, None = 76.7%	

Table 2: Independent samples t-test averages of self-report questionnaires.

	US		Hong Kong	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Suppression	13.31	5.20	16.43**	4.32
Independence	5.71**	.62	3.64	.41
Interdependence	5.06**	.65	3.80	.39
Tradition	.21*	.53	-.08	.46
Self-Direction	-.44	.54	-.04**	.45
Hedonism	-1.09	.78	-.56**	.61
Intellectual	3.20	.76	3.75*	.81
Autonomy				

* $p < 0.05$. ** $p < 0.01$

Table 3: Duration of fixation ratios across culture by arousal level.

		US			Hong Kong		
<i>Arousal level</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	
Excited (HAP)	28	.38	.10	24	.46	.13	
Calm (LAP)	28	.36	.07	24	.41	.11	

Table 4: Correlations between excited and calm duration ratios and choice preference ratio by culture.

		1	2	3	4	5	6	7	8
US	1. Excited Duration Ratio	-	.74**	.16	-.04	-.07	.10	.10	-.14
	<i>n</i>		28	28	28	28	28	28	21
	2. Calm Duration Ratio		-	.08	.05	-.24	.12	.02	-.17
	<i>n</i>			28	28	28	28	28	21
	3. Choice preference ratio			-	.43**	.10	.00	.10	-.14
	<i>n</i>				32	32	32	32	24
	4. SCS independence				-	.23	-.04	.42*	.14
	<i>n</i>					32	32	32	24
	5. SCS interdependence					-	-.05	.46**	-.21
	<i>n</i>						32	32	24
6. ERQ suppression						-	-.15	.07	
<i>n</i>							32	24	
7. ERQ reappraisal							-	.16	
<i>n</i>								24	
8. Benevolence									-
<i>n</i>									
Hong Kong	1. Excited Duration Ratio	-	-.81**	.55**	-.23	.21	-.40	-.15	.46*
	<i>n</i>		24	24	24	24	24	24	20
	2. Calm Duration Ratio		-	-.46*	.13	.12	.08	.31	-.39
	<i>n</i>			24	24	24	24	24	20
	3. Choice preference ratio			-	-.22	-.03	-.42*	-.27	.54**
	<i>n</i>				30	30	30	30	26
	4. SCS independence				-	.07	.23	.21	.00
	<i>n</i>					30	30	30	26
	5. SCS interdependence					-	-.48**	.17	-.07
	<i>n</i>						30	30	26
6. ERQ suppression						-	.08	-.01	
<i>n</i>							30	26	
7. ERQ reappraisal							-	-.12	
<i>n</i>								26	
8. Benevolence									-
<i>n</i>									

* $p < 0.05$. ** $p < 0.01$

Appendix A: Demographics Questionnaire

Participant number: _____

Age: _____

Sex: M F

Race/ethnicity: _____

Religious affiliation: _____

Length of time spent living in the United States: _____

Appendix C: Self-Construal Scale

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree
I should be judged on my own merit.						
1	2	3	4	5	6	7
Being able to take care of myself is a primary concern for me.						
1	2	3	4	5	6	7
My personal identity is important to me.						
1	2	3	4	5	6	7
I consult others before making important decisions.						
1	2	3	4	5	6	7
I consult with co-workers on work-related matters.						
1	2	3	4	5	6	7
I prefer to be self-reliant rather than depend on others.						
1	2	3	4	5	6	7
I will sacrifice my self-interest for the benefit of my group.						
1	2	3	4	5	6	7
I stick with my group even through difficulties.						
1	2	3	4	5	6	7
I respect decisions made by my group.						
1	2	3	4	5	6	7
I will stay in a group if it needs me, even if I am not happy with it.						
1	2	3	4	5	6	7
I maintain harmony in the groups of which I am a member.						
1	2	3	4	5	6	7
I respect the majority's wishes in groups of which I am a member.						
1	2	3	4	5	6	7
I remain in the groups of which I am a member if they need me, even though I am dissatisfied with them.						
1	2	3	4	5	6	7

I am a unique person separate from others.

1 2 3 4 5 6 7

If there is a conflict between my values and values of groups of which I am a member, I follow my values.

1 2 3 4 5 6 7

I try to abide by customs and conventions at work.

1 2 3 4 5 6 7

I try not to depend on others.

1 2 3 4 5 6 7

I take responsibility for my own actions.

1 2 3 4 5 6 7

I give special consideration to others' personal situations so I can be efficient at work.

1 2 3 4 5 6 7

It is better to consult others and get their opinions before doing anything.

1 2 3 4 5 6 7

It is important to consult close friends and get their ideas before making a decision.

1 2 3 4 5 6 7

It is important for me to act as an independent person.

1 2 3 4 5 6 7

I should decide my future on my own.

1 2 3 4 5 6 7

What happens to me is my own doing.

1 2 3 4 5 6 7

My relationships with others are more important to me than my accomplishments.

1 2 3 4 5 6 7

I enjoy being unique and different from others.

1 2 3 4 5 6 7

I am comfortable being singled out for praise and rewards.

1 2 3 4 5 6 7

I don't support a group decision when it is wrong.

1 2 3 4 5 6 7

Appendix C: Value Scale

Rate how important each of the following values is in YOUR life. When you answer these questions, think about how important each of these values is in YOUR self-concept, how much the value influences YOUR goals, aspirations, beliefs, and actions.

	Not Important							Extremely Important
1. A spiritual life (emphasis on spiritual not material matters)	0	1	2	3	4	5	6	7
2. A varied life (filled with challenge, novelty, and change)	0	1	2	3	4	5	6	7
3. A world of beauty (beauty of nature and the arts)	0	1	2	3	4	5	6	7
4. A world at peace (free of war and conflict)	0	1	2	3	4	5	6	7
5. Accepting my portion in life (submitting to life's circumstances)	0	1	2	3	4	5	6	7
6. Ambitious (hardworking, aspiring)	0	1	2	3	4	5	6	7
7. An exciting life (stimulating experiences)	0	1	2	3	4	5	6	7
8. Authority (the right to lead or command)	0	1	2	3	4	5	6	7
9. Broad-minded (tolerant of different ideas and beliefs)	0	1	2	3	4	5	6	7
10. Capable (competent, effective, efficient)	0	1	2	3	4	5	6	7
11. Choosing own goals (selecting own purposes)	0	1	2	3	4	5	6	7
12. Clean (neat, tidy)	0	1	2	3	4	5	6	7
13. Creativity (uniqueness, imagination)	0	1	2	3	4	5	6	7
14. Curious (interested in everything, exploring)	0	1	2	3	4	5	6	7
15. Daring (seeking adventure, risk)	0	1	2	3	4	5	6	7

Rate how important each of the following values is in YOUR life. When you answer these questions, think about how important each of these values is in YOUR self-concept, how much the value influences YOUR goals, aspirations, beliefs, and actions.

	Not Important					Extremely Important		
16. Detachment (from worldly concerns)	0	1	2	3	4	5	6	7
17. Devout (holding to religious faith and belief)	0	1	2	3	4	5	6	7
18. Enjoying life (enjoying food, sex, leisure, etc.)	0	1	2	3	4	5	6	7
19. Equality (equal opportunity for all)	0	1	2	3	4	5	6	7
20. Family security (safety for loved ones)	0	1	2	3	4	5	6	7
21. Forgiving (willing to pardon others)	0	1	2	3	4	5	6	7
22. Freedom (freedom of action and thought)	0	1	2	3	4	5	6	7
23. Healthy (not being sick physically or mentally)	0	1	2	3	4	5	6	7
24. Helpful (working for the welfare of others)	0	1	2	3	4	5	6	7
25. Honest (genuine, sincere)	0	1	2	3	4	5	6	7
26. Honoring of parents and elders (showing respect)	0	1	2	3	4	5	6	7
27. Humble (modest, self-effacing)	0	1	2	3	4	5	6	7
28. Independent (self-reliant, self-sufficient)	0	1	2	3	4	5	6	7
29. Influential (having an impact on people and events)	0	1	2	3	4	5	6	7
30. Inner harmony (at peace with myself)	0	1	2	3	4	5	6	7

Rate how important each of the following values is in YOUR life. When you answer these questions, think about how important each of these values is in YOUR self-concept, how much the value influences YOUR goals, aspirations, beliefs, and actions.

	Not Important						Extremely Important
31. Intelligent (logical, thinking)	0	1	2	3	4	5	6 7
32. Loyal (faithful to my friends, group)	0	1	2	3	4	5	6 7
33. Mature love (deep emotional and spiritual intimacy)	0	1	2	3	4	5	6 7
34. Meaning in life (a purpose in life)	0	1	2	3	4	5	6 7
35. Moderate (avoiding extremes of feeling and action)	0	1	2	3	4	5	6 7
36. National security (protection of my nation from enemies)	0	1	2	3	4	5	6 7
37. Obedient (dutiful, meeting obligations)	0	1	2	3	4	5	6 7
38. Pleasure (gratification of desires)	0	1	2	3	4	5	6 7
39. Politeness (courtesy, good manners)	0	1	2	3	4	5	6 7
40. Preserving my public image (protecting my "face")	0	1	2	3	4	5	6 7
41. Protecting the environment (preserving nature)	0	1	2	3	4	5	6 7
42. Reciprocation of favors (avoidance of indebtedness)	0	1	2	3	4	5	6 7
43. Respect for tradition (preservation of time-honored customs)	0	1	2	3	4	5	6 7
44. Responsible (dependable, reliable)	0	1	2	3	4	5	6 7
45. Self-discipline (self-restraint, resistance to temptation)	0	1	2	3	4	5	6 7

Rate how important each of the following values is in YOUR life. When you answer these questions, think about how important each of these values is in YOUR self-concept, how much the value influences YOUR goals, aspirations, beliefs, and actions.

	Not Important							Extremely Important
46. Self-respect (belief in one's own worth)	0	1	2	3	4	5	6	7
47. Sense of belonging (feeling that others care about me)	0	1	2	3	4	5	6	7
48. Social justice (correcting injustice, care for the weak)	0	1	2	3	4	5	6	7
49. Social order (stability of society)	0	1	2	3	4	5	6	7
50. Social power (control over others, dominance)	0	1	2	3	4	5	6	7
51. Social recognition (respect, approval by others)	0	1	2	3	4	5	6	7
52. Successful (achieving goals)	0	1	2	3	4	5	6	7
53. True friendship (close, supportive friends)	0	1	2	3	4	5	6	7
54. Unity with nature (fitting into nature)	0	1	2	3	4	5	6	7
55. Wealth (material possessions, money)	0	1	2	3	4	5	6	7
56. Wisdom (a mature understanding of life)	0	1	2	3	4	5	6	7