

THE STUDY OF EMOTIONAL CONTAGION FROM THE PERSPECTIVE OF INTERPERSONAL RELATIONSHIPS

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Emotional contagion was examined from the perspective of interpersonal relationships. Using a vignette paradigm, 156 Japanese undergraduates (108 females and 48 males) assumed either a friend, acquaintance, senior, or junior as their partner. Their emotional expression and experience were measured when their assumed partner told them of intensely positive episodes (e.g., the long-sought passing of a certification examination) and intensely negative episodes (e.g., the death of their mother). Emotional responses were significantly stronger in the friend, senior, and junior conditions than in the acquaintance condition for both positive and negative episodes, suggesting the degree of intimacy in the interpersonal relationship influenced emotional contagion. Emotional responses were also stronger in the junior condition than in the senior condition, suggesting that social power in interpersonal relationships influenced emotional contagion. Moreover, sad expressions resulting from partners' disclosures did not differ across conditions, reflecting the display rule of negative emotions in Japan. These results indicate that interpersonal relationships need to be taken into account in the model of emotional contagion.

Keywords: emotional contagion, interpersonal relationships, vignette paradigm, emotional expressions, intimacy.

Emotional contagion refers to the tendency to catch (experience / express) another person's emotions (Hatfield, Cacioppo, & Rapson, 1994, p. 7). In

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everyday life, people commonly disclose emotional experiences to others, but the listener does not always share the same emotion as the person relaying the experience. Some people are more sensitive than others to the emotional expressions of those around them, and people are more likely to share emotions in certain relationships. Personal factors and relationship factors both influence the processes of emotional contagion. The present experiment examined two factors that influence emotional contagion; individual differences in emotional susceptibility, and interpersonal relationships.

INDIVIDUAL DIFFERENCES IN EMOTIONAL SUSCEPTIBILITY

Previous studies have described the mechanism for emotional contagion as innate and automatic, emphasizing both its universality and its ubiquity. However, emotional contagion does not always occur because of individual differences in emotional susceptibility. Hatfield et al. (1994) proposed that emotionally susceptible people are those who: (a) pay attention to others and are able to read others' emotional expressions; (b) construe themselves as interrelated with others rather than independent and unique; (c) tend to mimic facial, vocal, and postural expressions; and (d) have a conscious emotional experience that is powerfully influenced by peripheral feedback.

Based on the above characteristics, Doherty (1997) developed the Emotional Contagion Scale (ECS), a 15-item unidimensional measure of susceptibility to others' emotions, using samples in Hawai'i, Manoa, and Maui. Principal components analysis of the items yielded a one-factor model that best fit the data. In addition, two sets of intercorrelated items were found. One was a positive subscale (consisting of the love and happiness items) and the second was a negative subscale (consisting of the fear, anger, and sadness items). Although Doherty pointed out the possibility that the ECS had a multidimensional structure, it was finally concluded that the ECS had a single structure.

However, because emotions vary on a broad spectrum, and each emotion has its own processes, it may well be more valid to consider emotional contagion as a multidimensional structure rather than a unidimensional structure. Kimura, Yogo, and Daibo (2007) translated the ECS into Japanese, and refined the factor structure.¹ From the results of factor analysis, ECS was composed of 4 factors; Happiness contagion, Sadness contagion, Anger contagion, and Love contagion. Each factor had internal consistency and test-retest reliability. In this study, we reconfirmed the four-factor structure of the ECS.

¹ The EC Scale (Doherty, 1997) was translated into Japanese. Two undergraduate students who had studied for at least four years in North America, two professors who specialize in social psychology, and one undergraduate student majoring in social psychology engaged in the translation process.

INTERPERSONAL RELATIONSHIPS AND EMOTIONAL CONTAGION

Previous studies have focused largely on individual differences in emotional susceptibility, with only a few relationship factors taken into account. Gump and Kulik (1997) incorporated either strangers or confederates as participants' partners in stressful situations and found that affiliation facilitated emotional contagion. In addition to the degree of affiliation in interpersonal relationships, social power also plays a role in emotional contagion. Snodgrass (1985) demonstrated that people whose social power was low were sensitive to the emotions of people with high social power. Additionally, it was reported that superiors were more expressive than subordinates (Hall, Rosip, Smith LeBeau, Horgan, & Carter, 2006). In contrast, Hsee, Hatfield, and Carlson (1990) found that people with high social power tend to mimic the target persons' emotional expressions more than do people with low social power. However, the social relationship between participants and target persons in the Hsee et al. study was not clearly defined.

The nature of the relationships examined in previous studies is problematic, as strangers or confederates (e.g., Gump & Kulik, 1997) clearly differ from relationships in everyday life where partners sharing emotions typically have preexisting relationships. One method to capture pre-existing interpersonal relationships, including varying degrees of intimacy and power differentials, is with vignette experiments. In this experiment, we adopted a vignette paradigm in which participants were instructed that their partner was either a friend, acquaintance, senior, or junior.

THEORETICAL BACKGROUND AND HYPOTHESES

Studies relying on strangers or confederates (e.g. Gump & Kulik, 1997) clearly differ from everyday life where partners sharing emotions typically have pre-existing relationships. Here we adopted a vignette paradigm in which real interpersonal relationships in daily life were used. Participants were instructed that their partner was either a friend, acquaintance, senior, or junior. We assumed that the level of intimacy would be higher in the friend, senior, and junior conditions than in the acquaintance condition. Because affiliation has been found to facilitate emotional contagion (Gump & Kulik), it was predicted that participants would be more susceptible to the friend, senior, or junior as partners, as compared to acquaintances (Hypothesis 1).

For social status, the senior condition would be the highest, friend and acquaintance conditions would be the second highest, and the junior condition would be the lowest.² Given the findings that people with lower social power are

² In Western culture, it may seem that people are rarely aware of differences of social power or social status for seniors or juniors in their university or office. However, in Japan, there are definite differences of social power or social status between seniors and juniors in universities and in the workplace (e.g., Nakane, 1970).

more sensitive to people's emotion than those with high social power (Snodgrass, 1985) and that superiors were more expressive than subordinates (Hall et al., 2006), it was predicted that the degree of emotional contagion would be the highest for the senior, second highest for the friend whose social status was the same as that of participants, and lowest for the junior whose social status was the lowest (Hypothesis 2).

In addition, we explored the moderating effect of different types of interpersonal relationships on the correlation between emotional susceptibility and emotional responses (emotional expressions and emotional experiences).

METHOD

SELECTION OF EMOTIONAL EXPERIENCE EPISODES

Based on previous studies (Kimura, Yogo, & Daibo, 2005; Yamamoto, Yogo, & Suzuki, 2004), emotional experience episodes for use in the vignette experiment were selected. Acquisitions of New Relationships and Goods, and Experiences of Success and Achievement were selected for the happy episodes, and Experiences of Loss, and Experiences of Failure and Frustration were selected for the sad episodes. Emotional episodes were as follows.

Acquisitions of New Relationships and Goods:

The other day, Assumed Partner (AP) started to date just the right person. Today, AP told you about this new relationship and expressed a feeling of happiness.

Experiences of Success and Achievement:

The other day, AP passed the most exclusive and difficult examination on which s/he had had his/her sights for a long time. Today, AP told you s/he had passed and expressed a feeling of happiness.

Experiences of Loss:

The other day, AP lost his/her dear mother. Today, AP told you about his/her mother's death and expressed a feeling of sadness.

Experiences of Failure and Frustration:

The other day, AP failed the most exclusive and difficult examination on which s/he had had his/her sights for a long time. Today, AP told you about the failure and expressed a feeling of sadness.

PARTICIPANTS

In total, 186 Japanese undergraduate students participated in this experiment for extra credit in psychology classes. One hundred and fifty-six participants (48 male, mean age = 21.31, $SD = 1.63$; 108 female mean age = 21.66, $SD = 4.46$) were included in the analysis, as 16 participants who did not indicate their gender and 14 participants whose questionnaires were incomplete were eliminated.

MEASURES

Participants were asked to answer the following seven sets of questions. (1) Demographic questions concerning their age and sex. (2) What the initials of their AP were in order to ensure the participants assumed their partner exactly. (3) They rated how intimate they and their AP were on a 7-point Likert scale (1 = *not at all*, 7 = *extremely*). (4) Following each of the four vignettes, they rated how much they thought their AP experienced happiness, sadness, anger, and interest on a 7-point Likert scale (1 = *not at all*, 7 = *extremely*). (5) They were asked to rate how much they experienced happiness, sadness, anger, and interest on a 7-point Likert scale (1 = *not at all*, 7 = *extremely*) when their AP disclosed their emotional experiences in the vignettes. (6) They were asked to rate how much they expressed each of the four listed emotions on a 7-point Likert scale (1 = *not at all*, 7 = *extremely*) when their assumed partner disclosed their emotional experiences.³ (7) Finally, they completed the Japanese version of the EC Scale (Kimura et al., 2007) answering each item on a 4-point Likert scale (1 = *never*, 2 = *rarely*, 3 = *often*, and 4 = *always*).

PROCEDURE

Each participant was randomly assigned to one of four groups: the friend, acquaintance, senior, or junior condition. They were instructed that, for the experiment, “friend” meant a person whom the participant knew and usually communicated with, “acquaintance” meant a person whom the participant knew and seldom communicated with, “senior” meant a person whose social status was higher than the participant’s, and “junior” meant a person whose social status was lower than the participant’s.

In each condition, participants were asked to assume a partner appropriate to their assigned condition. They completed the ratings described above in which their assumed partner disclosed each of the four emotional experiences. The order of the presentation of the emotional experiences was counterbalanced across participants.

³ We adopted the method of a vignette experiment with questionnaire. In this approach, it is difficult to distinguish between intended emotional expression and unintended emotional expression. Hatfield et al. (1994) pointed out the possibility that cognitive processes mediate emotional contagion when emotional contagion is viewed broadly. In addition, Hatfield et al. suggested that primitive emotional contagion does not mediate cognitive processes. This study examined emotional contagion in the broad sense of the term. Although we discussed whether the results in this study could be extended to primitive emotional contagion later, an experiment which includes face-to-face communication would be needed in future research.

RESULTS

MANIPULATION CHECK OF INTIMACY

To confirm that the manipulation of intimacy had been successful, a one-way ANOVA was conducted on the ratings of intimacy that participants indicated for their AP. A main effect of the type of interpersonal relationships was found ($F(3, 152) = 19.92, p < .0001$). The four types of interpersonal relationship were then compared using Tukey's method. As expected, the results showed that friend ($n = 34, M = 5.91, SD = 1.11$) yielded the highest scores of intimacy. Junior ($n = 42, M = 5.60, SD = 1.08$) was the second highest, senior ($n = 38, M = 5.32, SD = 1.45$) the third highest, and acquaintance ($n = 42, M = 3.81, SD = 1.55$) the lowest. There were significant differences between friend and acquaintance, senior and acquaintance, and junior and acquaintance. These results confirmed that the manipulation of intimacy was successful.

INDIVIDUAL DIFFERENCES IN EMOTIONAL SUSCEPTIBILITY

TABLE 1
FACTOR LOADING OF THE EMOTIONAL CONTAGION SCALE ($N = 156$)

	Factor 1 Love	Factor 2 Sadness	Factor 3 Anger	Factor 4 Happiness
I sense my body responding when the one I love touches me.	.90	-.10	.02	-.00
I melt when the one I love holds me close.	.83	.11	-.05	-.05
When I look into the eyes of the one I love, my mind is filled with thoughts of romance.	.78	.03	.05	.07
If someone I'm talking with begins to cry, I get teary eyed.	-.09	.83	.11	-.04
I cry at sad movies.	-.01	.81	-.05	.01
I get filled with sorrow when people talk about the death of their loved ones.	.17	.69	-.05	.04
I notice myself getting tense when I'm around people who are stressed out.	-.06	.05	.82	.13
I tense when overhearing an angry quarrel.	.02	.06	.76	-.05
It irritates me to be around angry people.	.08	-.09	.73	-.10
Being with a happy person picks me up when I'm feeling down.	.01	-.08	.03	.91
Being around happy people fills my mind with happy thoughts.	.01	.09	-.05	.83
Factor correlation		Sadness	Anger	Happiness
Love		.31	.05	.22
Sadness			.14	.32
Anger				-.01

Consistent with Kimura et al. (2007), the four factors were extracted as a result of factor analysis employing an oblique rotation: Love Contagion, Sadness Contagion, Anger Contagion, and Happiness Contagion (Table 1). Interfactor correlations ranged from $-.01$ to $.32$. Analysis of the internal consistency of each factor revealed Cronbach's α of $.80$ for Love Contagion, $.70$ for Sadness Contagion, $.66$ for Anger Contagion, and $.70$ for Happiness Contagion. Means and standard deviations were as follows: Love Contagion ($M = 3.17$, $SD = 0.64$), Sadness contagion ($M = 2.94$, $SD = 0.65$), Anger Contagion ($M = 3.01$, $SD = 0.62$), and Happiness Contagion ($M = 2.75$, $SD = 0.73$).

We also conducted covariance structure analyses to confirm the four-factor structure of the ECS (Kimura et al., 2007). First, we tested Doherty's (1997) unidimensional model. The data did not support a one-factor model ($\chi^2(44) = 218.76$, $p < .0001$, CFI = 0.56, RMSEA = 0.16). Second, we tested a four-factor model (Kimura et al., 2007) and found that the data supported this model ($\chi^2(38) = 40.57$, ns , CFI = 0.99, RMSEA = 0.02). Thus, the multidimensional structure of the ECS was clearly demonstrated. These results showed that the multidimensional structure was more valid for the ECS than was the unidimensional structure.

INTERPERSONAL RELATIONSHIPS AND EMOTIONAL CONTAGION

The means and standard deviations for the emotional experiences of the AP, emotional experiences of the participants, and emotional expressions of the participants are shown in Table 2. We calculated Pearson's correlations between ratings of the two happy episodes for the participants' ratings of their AP's emotional experience, the participants' emotional experiences, and the participants' emotional expressions. Significant positive correlations were found between these episodes for all rating types. Therefore the mean ratings for the episodes were calculated and used in subsequent analyses. Similarly, we calculated the Pearson's correlations between ratings of the two sad episodes. Significant positive correlations were found between these episodes. Therefore we calculated the means for these two episodes and used these scores in the following analyses.

SUCCESS OF THE EMOTIONAL EPISODES MANIPULATION

A one-way ANOVA was conducted on the degree of participants' ratings of their AP's emotional experiences by each type of interpersonal relationship (Table 2). In each type of interpersonal relationship, participants assumed that when their AP disclosed happy experiences, their AP primarily experienced happiness. Similarly, when their AP disclosed sad experiences, participants thought that AP primarily experienced sadness. This relationship was consistent for all types of interpersonal relationships, demonstrating the success of the manipulation of emotional episodes in the vignette experiment.

TABLE 2
MEANS AND STANDARD DEVIATIONS OF AP'S EMOTIONAL EXPERIENCES AND PARTICIPANTS' EMOTIONAL EXPERIENCES AND EXPRESSIONS

Event	Happiness		Sadness		Anger		Interest		F	df	p
	M	SD	M	SD	M	SD	M	SD			
Happy	AP	6.81 ^a	0.33	1.12 ^c	1.01 ^c	0.09	5.54 ^b	1.21	712.23		
	Experience	5.76 ^a	1.16	1.59 ^b	1.37 ^b	0.73	5.28 ^a	1.21	169.07		
	Expression	6.03 ^a	1.09	1.40 ^b	1.13 ^b	0.38	5.56 ^a	1.07	252.28		
Sad	AP	1.06 ^c	0.16	6.50 ^a	3.62 ^b	1.34	2.97 ^b	1.52	156.85	3, 33	p < .0001
	Experience	1.32 ^d	0.41	5.54 ^a	2.38 ^c	1.32	3.31 ^b	1.55	88.00		
	Expression	1.15 ^d	0.36	5.53 ^a	1.17 ^c	2.31 ^c	3.19 ^b	1.65	85.04		
Happy	AP	6.76 ^a	0.53	1.11 ^c	0.39	1.04 ^c	0.14	5.68 ^b	1.34	666.14	
	Experience	5.42 ^a	1.34	1.37 ^b	0.79	1.28 ^b	0.70	5.29 ^a	1.61	157.39	
	Expression	5.87 ^a	1.21	1.13 ^b	0.47	1.01 ^b	0.08	5.61 ^a	1.41	378.61	
Sad	AP	1.09 ^c	0.30	6.43 ^a	0.81	3.63 ^b	1.49	2.96 ^b	1.82	129.49	3, 37
	Experience	1.21 ^c	0.69	5.20 ^a	1.45	1.70 ^c	1.03	3.72 ^b	1.49	91.20	p < .0001
	Expression	1.04 ^c	0.18	5.38 ^a	1.43	1.62 ^c	1.17	2.95 ^b	1.48	104.39	
Happy	AP	6.93 ^a	0.24	1.10 ^c	0.42	1.11 ^c	0.42	5.60 ^b	1.34	775.13	
	Experience	5.96 ^a	0.95	1.39 ^c	0.83	1.25 ^c	0.65	5.38 ^b	1.13	378.06	
	Expression	6.36 ^a	0.81	1.11 ^c	0.34	1.07 ^c	0.26	5.73 ^b	0.96	834.57	
Sad	AP	1.17 ^d	0.65	6.63 ^a	0.60	4.08 ^b	1.34	2.29 ^c	1.46	179.01	3, 41
	Experience	1.17 ^d	0.50	5.63 ^a	1.03	2.05 ^c	1.16	3.23 ^b	1.21	140.59	p < .0001
	Expression	1.04 ^d	0.17	5.65 ^a	1.12	1.96 ^c	1.04	2.58 ^b	1.36	154.52	
Happy	AP	6.62 ^a	1.09	1.29 ^c	0.98	1.18 ^c	0.59	5.40 ^b	1.69	216.85	
	Experience	4.93 ^a	1.47	1.46 ^b	0.74	1.29 ^b	0.63	4.45 ^a	1.62	122.12	
	Expression	5.74 ^a	1.22	1.06 ^c	0.23	1.02 ^c	0.15	4.95 ^b	1.43	369.20	
Sad	AP	1.24 ^c	0.95	6.37 ^a	1.23	3.52 ^b	1.61	2.81 ^b	1.60	100.89	3, 41
	Experience	1.20 ^c	0.52	4.90 ^a	1.27	1.52 ^c	0.74	3.40 ^b	1.35	134.09	p < .0001
	Expression	1.04 ^d	0.13	5.56 ^a	1.28	1.68 ^c	0.92	3.18 ^b	1.36	160.42	

Note: Means having the same superscript are not significantly different at $p < .05$ in the Tukey significant difference comparison.

DOES EMOTIONAL CONTAGION OCCUR IN EACH TYPE OF INTERPERSONAL RELATIONSHIP?

We examined whether or not emotional contagion occurred in each type of interpersonal relationship. First, we conducted a one-way ANOVA on the scores of participants' emotional experiences when their AP disclosed an emotional experience to determine whether emotional contagion would occur in each type of interpersonal relationship (Table 2). These results showed there were main effects for type of emotion. That is, when their AP disclosed a happy experience, participants experienced happiness the most, interest the second, and they rarely experienced sadness or anger. Consistent with this, when their AP disclosed their sad experience, participants experienced sadness the most, interest the second, and rarely any experiences of happiness and anger. Clearly participants experienced the same emotions as those they assumed their AP experienced while disclosing the emotional experiences, regardless of the type of interpersonal relationship they were engaged in. The same analysis was conducted on the scores for participants' emotional expressions when their AP disclosed an emotional experience. The results were identical to the emotional experience results.⁴

WHAT RELATIONSHIP FACILITATES EMOTIONAL CONTAGION?

Having confirmed that emotional contagion occurred regardless of the type of interpersonal relationship, we sought to determine what type of relationship facilitated emotional contagion the most by comparing the degree of emotional contagion among types of interpersonal relationships.

Emotional Experiences of Happiness To examine which relationship facilitated the emotional contagion of happy experiences, we conducted one-way ANOVA on scores of participants' happy experiences in response to their AP's disclosure of happy experiences. There was a main effect for type of interpersonal relationship ($F(3, 152) = 5.42, p < .001$). The four types of interpersonal relationship were compared using Tukey's method. It was found that friend yielded the highest scores, junior the second highest, senior the third highest, and acquaintance the lowest. Significant differences were obtained between friend and acquaintance, and between junior and acquaintance.

Emotional Expressions of Happiness To determine which relationship facilitated the emotional contagion of happy expressions, a one-way ANOVA

⁴ These results indicated emotional contagion based on relative differences of the means between emotions. However, we thought that these results showed happy contagion from the perspective of absolute values because the means of happy experiences and expressions when hearing happy episodes were significantly higher than theoretical medians. In the same way, the means of sad experiences and expressions when hearing sad episodes were significantly higher than theoretical medians.

was conducted on scores of participants' happy expressions when their AP disclosed happy experiences. The results showed a marginal main effect for type of interpersonal relationship ($F(3, 152) = 2.46, p < .07$). The four types of interpersonal relationship were then compared using Tukey's method. For emotional expressions of happiness, the scores from highest to lowest were junior, friend, senior, and acquaintance. Only the difference between junior and acquaintance was significant.

Emotional Experiences of Sadness To examine which relationship facilitated emotional contagion of sad experiences, we conducted a one-way ANOVA on scores of participants' sad experiences when their AP disclosed sad experiences. The results showed a main effect for type of interpersonal relationship ($F(3, 152) = 3.05, p < .05$). Then, we compared the four types of interpersonal relationship using Tukey's method. The scores from highest to lowest were: junior, friend, senior, and acquaintance. A significant difference was seen between junior and acquaintance.

Emotional Expressions of Sadness To examine which relationship facilitated emotional contagion of sad expressions, we conducted a one-way ANOVA on scores of participants' sad experiences when their AP disclosed sad experiences. In this case, no main effect of type of interpersonal relationship was seen ($F(3, 152) = 0.32, ns$). It appeared that intimacy and social status had no influence on emotional contagion of sad expressions.⁵

Associations between the Personal Factor and the Relationship Factor We examined the moderating effect of different types of interpersonal relationships on the correlations between individual differences in emotional susceptibility and emotional responses (emotional expressions and emotional experiences). Pearson correlations were calculated between individual differences in emotional susceptibility, as measured by subscales of the ECS (i.e., Happiness Contagion and Sadness Contagion), and participants' emotional experiences and expressions for each type of interpersonal relationship.

Results for the emotional contagion of happiness were calculated between the scores for the Happiness Contagion factor and participants' experiences and expressions of happiness. These are shown in Table 3. There were significant positive correlations between the emotional susceptibility to happiness and participants' experiences of happiness in the senior, junior, and acquaintance condition, but not in the friend condition. It is possible that emotional contagion of happiness occurred regardless of individual levels of emotional susceptibility to happiness when the disclosing AP was a friend. Also of note, the correlation

⁵ We also conducted a 2 (emotional event) $\times 2$ (emotional experience / expression) $\times 4$ (type of interpersonal relationship) MANOVA on rating of emotions, to avoid Type 1 error. As a result, we confirmed that type of interpersonal relationship influenced emotional contagion.

between emotional susceptibility to happiness and participants' expressions of happiness were significant for seniors and acquaintances, but not for juniors or friends.

TABLE 3
CORRELATIONS BETWEEN THE PERSONAL FACTOR AND THE RELATIONSHIP FACTOR FOR
HAPPINESS CONTAGION AND SADNESS CONTAGION

	Happiness Contagion		Sadness Contagion	
	Experience	Expression	Experience	Expression
Friend	.17	.26	.23	.20
Senior	.51**	.36**	.53**	.59**
Junior	.43**	.20	.64**	.46**
Acquaintance	.47**	.32*	.37**	.49**

* $p < .05$, ** $p < .01$

Results for the emotional contagion of sadness were calculated using the scores for the Sadness Contagion factor and participants' experiences and expressions of sadness. The results are also shown in Table 3. There were significant positive correlations in the senior, junior, and acquaintance conditions for both the experience and the expression of sadness. In contrast, there were no significant correlations in the friend condition. As with happiness, it is possible that when friends disclosed sad episodes, emotional contagion of sadness occurred regardless of individual differences in emotional susceptibility to sadness.

DISCUSSION

In this experiment, we demonstrated that characteristics of interpersonal relationships, specifically intimacy and social status, influenced emotional contagion. In addition, the type of interpersonal relationship moderated correlations between individual differences in emotional susceptibility and emotional responses during emotional contagion. Taken together, the results point to the need to develop a comprehensive model of emotional contagion that considers personal factors and relationship factors.

INTERPERSONAL RELATIONSHIPS AND EMOTIONAL CONTAGION

Generally, participants expressed and experienced the same emotions their AP had experienced when disclosing the emotional episodes, regardless of the type of interpersonal relationship. This finding supported the universality of emotional contagion proposed by Hatfield et al. (1994). However, the degree of emotional contagion differed with the type of interpersonal relationship. It was suggested that relationship factors influenced emotional contagion.

Paying attention to each result, for experiences of happiness, participants were more susceptible to those with whom they shared the highest degree of intimacy, friends, juniors, and seniors, as compared to acquaintances, with whom they shared the lowest degree of intimacy. In addition, there was a tendency for participants to be more susceptible to juniors, whose social status was low, than to seniors, whose social status was high, though the difference between these relationships was not significant statistically. In regard to the expressions of happiness, participants were more expressive to highly intimate friends, seniors, or juniors, as compared to low-intimacy acquaintances. Participants were also more expressive to juniors, whose social status was lower, than to seniors, whose social status was higher. Meanwhile, for experiences of sadness, participants were more susceptible to friends, seniors, and juniors, than they were to acquaintances. Participants were also more susceptible to juniors, whose social status was low than to seniors, whose social status was high.

Based on the results, the hypothesis that participants would be more susceptible to emotional contagion with highly intimate friends, seniors, or juniors, as compared to acquaintances with a low degree of intimacy (Hypothesis 1) was partially supported. On the other hand, because more attention is paid to those who have higher social power, it was also hypothesized that participants would be most susceptible to emotional contagion with seniors, followed by friends, and then juniors (Hypothesis 2). However, this hypothesis was not supported by the data. It is possible that when the AP was a junior, participants may have felt the need to give their AP more emotional support due to the difference in their social roles.

It is interesting to note that the results for sad expressions differed from the other results. When the AP disclosed sad experiences, participants' sad expressions did not differ across the types of interpersonal relationships. This result was attributed to the display rules about negative emotions that have been demonstrated in Japan (e.g., Matsumoto & Ekman, 1989). As a result of the strong cultural rules against displaying negative emotion, interpersonal relationships were unlikely to exert any influence on the emotional contagion of sad expressions.

ASSOCIATIONS BETWEEN THE PERSONAL FACTOR AND THE RELATIONSHIP FACTOR

While the correlations between individual differences in emotional susceptibility and the degrees of emotional contagion were significant in the senior, junior, and acquaintance condition, they were not significant in the friend condition. The lack of correlations in the friend condition might well result from the defined characteristics of friendships in the present experiment. Friends were defined as having a higher degree of intimacy than acquaintances, but the same level

of intimacy as that shared with seniors and juniors. The difference between them was social status. The social status of friends was lower than seniors, but higher than juniors, with friends having equal social status to participants in the experiment. Argyle and Henderson (1985) found that there were strong social norms that people must disclose personal emotions and give emotional support when needed among friends. In contrast, social norms dictate that in relationships between superiors and inferiors, people must respect each other's privacy. The different social norms that apply to different types of interpersonal relationships may explain the results of this study. That is, for intimate and equal relationships such as friendships, social norms may have reduced individual differences in emotional susceptibility. Also, when a junior disclosed a happy episode, there was no significant correlation between emotional susceptibility of happiness and participants' expressions of happiness. This result might be explained by social norms that people whose social status is high must compliment and admire people whose social status is low (Argyle & Henderson, 1985). According to social norms, people might have chosen to compliment and admire juniors in this study, regardless of individual differences in emotional susceptibility. In support of the specificity of the above result to emotional expression, when juniors disclosed a happy episode, there was a significant correlation between emotional susceptibility to happiness and participants' experiences of happiness. When juniors disclosed their emotional episodes of happiness, people would experience happiness depending on individual differences in emotional susceptibility to happiness, while they might express happiness equally according to social norms.

CULTURE AND EMOTIONAL CONTAGION

From a cultural perspective, it was notable that social status influenced emotional contagion. This was likely due to the cultural characteristics of Japanese people, as their relationships between superiors and inferiors are strongly regulated (e.g., Nakane, 1970). Further to this, emotional contagion occurred most in response to disclosures by an AP who was junior in status. This finding can be explained by Doi's (1971) conclusion that people whose social status is low depend on people whose social status is high, and those who have high social status protect those who have low social status. Relationships between juniors and seniors in Japan display these asymmetric properties.

In addition, participants were more susceptible to a friend, senior, or junior with whom they shared a high degree of intimacy, as compared to an acquaintance with whom they shared a low degree of intimacy. This finding reflects the characteristics of a collectivistic culture that emphasizes social coordination within in-groups (e.g., Markus & Kitayama, 1991). Indeed, previous studies have reported that the correlations between social power and

emotional experiences differ between cultures (e.g., Mondillon et al., 2005) and the differences between individualistic and collectivistic cultures influence emotions (e.g., Markus & Kitayama, 1991). Clearly it is important to consider cultural factors in theories of emotional contagion. However, because the present experiment involved only Japanese participants, direct cultural comparisons within the study were not possible. Future research applying the present vignette paradigm cross-culturally would allow for a better understanding of how culture affects emotional contagion.

LIMITATIONS IN THIS STUDY

To overcome the issues in using nonestablished relationships to study emotional contagion, we adopted a vignette paradigm instead of observing participants' behavior. However, the mechanism of emotional contagion remained unclear in this approach. There were two possible mechanisms: (1) "Primitive emotional contagion" which occurred through a process of automatic, synchronous nonverbal mimicry and feedback (Hatfield et al., 1994), and (2) "Emotional comparison" which was a more cognitively effortful process of emotional contagion. In the process of emotional comparison, people compare their moods with those of others and then respond according to what seems appropriate for the situation (e.g., Gump & Kulik, 1997). Emotional contagion through emotional comparison is related to the idea of empathy (e.g., Davis, 1994) where people either see or anticipate another person's emotional display and then experience the same emotions. Because we used a vignette paradigm in this study, there was a possibility that emotional contagion occurred through emotional comparison rather than primitive emotional contagion.

Hatfield et al. (1994) proposed that behavioral mimicry of emotional expressions facilitated emotional contagion, especially for primitive emotional contagion. Interactional synchrony has been found to occur in conversations about negative emotional episodes as well as positive emotional episodes (Kimura & Daibo, 2006). The question of whether or not interpersonal relationships influence primitive emotional contagion remains to be explored. This information would further develop theories in this area. The influence of behavioral mimicry or interactional synchrony would best be addressed in experimental paradigms using face-to-face communication.

CONCLUSIONS

Significant others provide people who have experienced an emotional experience with acceptable ways of dealing with the experience (Rimé, Philippot, Boca, & Mesquita, 1992). In addition, intimates are generally more accessible and available as listeners (Curci & Bellelli, 2004). In everyday life, our partners with whom we share our emotions are not strangers or confederates,

but people with whom we have previously formed relationships. The study of emotional contagion from the perspective of interpersonal relationships makes it possible to reveal how emotional contagion contributes to social adaptation in everyday life.

REFERENCES

- Argyle, M., & Henderson, M. (1985). *The anatomy of relationships and the rules and skills to manage them successfully*. London: Heinemann.
- Curci, A., & Bellelli, G. (2004). Cognitive and social consequences of exposure to emotional narratives: Two studies on secondary social sharing of emotions. *Cognition & Emotion*, **18**, 881-900.
- Davis, M. H. (1994). *Empathy: A social psychological approach*. Madison, WI: Brown & Benchmark.
- Doherty, R. W. (1997). The Emotional Contagion Scale: A measure of individual differences. *Journal of Nonverbal Behavior*, **21**, 131-154.
- Doi, T. (1971). *The anatomy of dependence*. Tokyo: Kodansha.
- Gump, B. B., & Kulik, J. A. (1997). Stress, affiliation, and emotional contagion. *Journal of Personality and Social Psychology*, **72**, 305-319.
- Hall, J. A., Rosip, J. C., Smith LeBeau, L., Horgan, T. G., & Carter, J. D. (2006). Attributing the sources of accuracy in unequal power dyadic communication: Who is better and why? *Journal of Experimental Social Psychology*, **42**, 18-27.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). *Emotional contagion*. New York and Cambridge, England: Cambridge University Press.
- Hsee, C. K., Hatfield, E., & Carlson, J. G. (1990). The effect of power on susceptibility to emotional contagion. *Cognition & Emotion*, **4**, 327-340.
- Kimura, M., & Daibo, I. (2006). Interactional synchrony in conversations about emotional episodes: A measurement by the between-participants pseudosynchrony experimental paradigm. *Journal of Nonverbal Behavior*, **30**, 115-126.
- Kimura, M., Yogo, M., & Daibo, I. (2005). The expressivity halo effect in the conversation about emotional episodes. *Japanese Journal of Research on Emotions*, **12**, 12-23.
- Kimura, M., Yogo, M., & Daibo, I. (2007). Development of a Japanese version of the Emotional Contagion Scale. *Japanese Journal of Interpersonal and Social Psychology*, **7**, 31-39.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implication for cognition, emotion, and motivation. *Psychological Review*, **98**, 224-253.
- Matsumoto, D., & Ekman, P. (1989). American-Japanese cultural differences in intensity ratings of facial expressions of emotion. *Motivation and Emotion*, **13**, 143-157.
- Mondillon, L., Niedenthal, P. M., Brauer, M., Rohmann, A., Dalle, N., & Uchida, Y. (2005). Beliefs about power and its relation to emotional experience: A comparison of Japan, France, Germany, and the United States. *Personality and Social Psychology Bulletin*, **31**, 1112-1122.
- Nakane, C. (1970). *Japanese society*. Berkeley: University of California Press.
- Rimé, B., Philippot, P., Boca, S., & Mesquita, B. (1992). Long-lasting cognitive and social consequences of emotion: Social sharing and rumination. In W. Stroebe & M. Hewstone (Eds.), *European Review of Social Psychology* (Vol. 3, pp. 225-258). Chichester, UK: Wiley.
- Snodgrass, S. E. (1985). Women's intuition: The effect of subordinate role on interpersonal sensitivity. *Journal of Personality and Social Psychology*, **49**, 146-155.
- Yamamoto, K., Yogo, M., & Suzuki, N. (2004). Intra-interpersonal factors inhibiting the disclosure of emotional episodes. *Japanese Journal of Research on Emotions*, **11**, 73-81.

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