Impact on Short-Term Mood by Two Factors of Viewing "Kawaii" Objects and Linguistic Communication

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Abstract

It is a general behavior for people who have similar tastes to share their feelings about an object related to "kawaii" and to communicate linguistically. It seems that communication by utterance of "kawaii" has a positive effect on short-term mood by the action of relieving psychological stress, and it improves the adaptability of human relationships. An experiment was conducted to measure short-term mood changes by two factors - viewing images considered "kawaii" or not, and with or without communication when viewing image of "kawaii" impression- and the results were evaluated by analysis of variance. As a result, the degree of activity, comfort, and arousal was increased when there was communication. The vitality increased after viewing images with a high impression of "kawaii", and participants became comfortable and active. However, in the case of viewing images with a low impression of "kawaii", there was no change after viewing the images regardless of whether it was with or without of communication, indicating that the communication had no effect. This suggests that only linguistic communication related to "kawaii" may amplify pleasure emotions. In terms of gender difference, the same results as those of all the experiment participants were seen in males, but in the case of females, viewing images with a low "kawaii" impression made them feel uncomfortable and depressed, regardless of communication. Therefore, for females, it was found that the image condition affects the short-term mood more than the communication condition.

Keywords: Kawaii, Cuteness, Communication, Mood, Feeling, Linguistic

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Introduction

In recent years, the Japanese government has launched the "Cool Japan Strategy" to spread the culture overseas. According to the "Cool Japan Strategy Initiative" announced by the Intellectual Property Strategy Promotion Office of the Cabinet Office on December 21, 2018, not only lifestyles and traditional cultures that represent Japan's nature, but also modern forms of culture including anime, manga and "kawaii" fashion is also designated as an important resource. Content with a modern "kawaii" impression is spread to other countries via Internet, so it is thought that it will have a high economic effect in the future. The study by Yamada and Morimoto (2015), it was shown that there was a unique process of communication via the Internet in the process of spreading "kawaii" culture. In communication through social media that accompanies "kawaii," people with similar tastes share the feeling of "kawaii" while exchanging information with each other on the Internet without feeling a distance. Even if the feelings for "kawaii" things are ambiguous at first glance, they have a certain unique power, and the feelings of other people are involved. There is also a phenomenon in which the sense of sharing of "kawaii" objects increases, which gradually forms a large group. There is an analysis showing that expression using "kawaii" spread through such a process is increasing year on year via overseas SNS in general society. When searching for "kawaii" on Instagram, the number of posts - excluding Japanese posts from April 1, 2017 to March 31, 2018 was 302,269 in the United States, 76,233 in the United Kingdom, and 75,027 in Russia. Furthermore, if you look at the hashtag "#kawaii", you can see that the top countries using it are the United States of America, Russia, France, Brazil, and Indonesia. Among the words that identify the "kawaii" culture, such as "#anime", "#art", "#cosplay", and "#japan", the word that occupies the first or second place in any country is "#love". From this phenomenon, it can be seen that the keyword "kawaii" may be related to the positive emotions inherent in individuals not only in Japan but also in other countries around the world. The reason why the expression "kawaii" spread instead of "cuteness" needs to be traced back to the origin of kawaii research.

Many of the overseas research examples related to "kawaii" are based on the concept of "baby-schema" by Animal psychologist Konrad. He found that when humans encounter the physical characteristics of baby animals, they have a psychological desire to protect their subjects. The concept of "baby-schema" was later evolved as the basis of a multifaceted research approach as a study of "cuteness". After that, research on "baby-schema" and the brain was also advanced, and in the research by Grocker et al. on the nucleus accumbency, which was activated by stimulus with cute objects, it was shown that elements of the "babyschema" activate sensations such as reward, pleasure, and addiction. However, it has been pointed out that previous studies on "baby-schemas" may differ from the nuances of Japanese "kawaii". Nittono (2013) describes a behavioral approach to "kawaii" which was a study by cognitive science Donald Arthur Norman (2004). Norman argued that the feeling of "cute" was transformed into feelings of "joy" and "fun", and this feeling of "shallow cuteness" becomes deep and long-lasting through wisdom. Regarding language issues, Nittono states that English "cuteness" refers to the attribute of the subject, and Japanese "kawaii" refers to the viewer's emotion. Etymologically, the Japanese expression "kawaii" comes from "poor", which expresses a feeling of pity for others, and it cannot be denied that the Japanese word "kawaii" is closely related to emotions. The Japanese study by Kanai et al. revealed that the higher the empathy, the easier it is for a person to have a "kawaii" feeling towards an object. People with a high degree of other-oriented tendency tend to want to protect the other person and stay with them because it is easy to imagine the feelings and conditions of the target person, especially when the target person is a baby human or animal. Furthermore, an

analysis of variance regarding gender for empathy and affinity motivation revealed that the main effect of gender was significant for empathy, and that female had more empathy than male. Their another study deals with "smiles" as a way to share emotions when looking at "kawaii" objects. In this study, Kanai et al. examined the correlation between "kawaii" emotions and smiles through physiological measurements of facial muscles. After that, subjective and behavioral items were investigated using a questionnaire. In addition, the activity of the zygomaticus major and corrugator supercilii muscles during browsing was also examined by physiological measurements. As a result, when the researcher saw the images of the category with the element of "kawaii" and got the pleasant feeling of "kawaii", he said that he saw a lively reaction in the facial muscles. However, the zygomaticus major muscle did not respond even when subjects were looking at images of beautiful scenery. The results of this study show that when people feel "kawaii", they express their emotions outwardly and try to express something through communication.

These studies have shown that viewing "kawaii" objects has an emotional effect. However, most of the studies have verified the experimental results by having a single participant viewing an object. Few studies discuss the emotions during communication that occur when multiple people view the same object related to "kawaii". However, it is undeniable that feelings about "kawaii" not only spring up toward the object, but also occur or are amplified by sharing feelings. The utterance of "kawaii" is intended to actively communicate with human beings, and it facilitates mutual relationships and increases intimacy through empathy. I presume that the existence of a common theme of "kawaii" creates empathic communication and leads to mutual understanding, which may have an impact on individual emotions and short-term mood. Therefore, the purpose of this study is to explore short-term mood change due to linguistic communication between humans accompanying the utterance of "kawaii". Specifically, I will explore short-term mood change depending on the presence or absence of conversation before and after viewing images related to "kawaii" through experiment. I set the hypothesis that short-term mood change is more likely to occur with linguistic communication with a "kawaii" emotion than when" kawaii" emotion occurs in the brain without linguistic communication. If the emotions associated with "kawaii" are shared by linguistic communication and the pleasure feelings are amplified in groups, it may be applied in fields such as clinical psychology in the future, making this a meaningful study.

Experiment and Stimulus

I recruited 48 participants who were divided into two groups. One group had two people participate in the experiment in pairs (with communication by utterance = C group) and 32 people (16 pairs) participated. The other group comprised single people participating in the experiment (with non-communication by utterance = NC group), and 16 people participated. In the experiment, I decided to analyze by two factors: the presence or absence of communication by utterance and whether the image used for the experimental task was evaluated as "kawaii". The experiment participants in C Group, who had communication by utterance, evaluated while viewing the images. The experiment participants in NC group evaluated images by thinking alone without communication by utterances. Two types of image presented in the experiment were prepared: an image with a strong impression of "kawaii" (High = H image) and an image with a low impression of "kawaii" (Low = L image). At the time of the experiment, six H or six L images were presented to the participants, and they were instructed to view and evaluate the images for 10 minutes. In order to measure short-term mood, TDMS-SD (two-dimensional mood scale) was used to measure four levels of "activity", "stability", "comfort", and "arousal" of the participants, and

the psychological state (short-term mood) was measured. TDMS-SD is a self-test that visualizes the state of mind. The eight questions were "calm", "irritated", "lethargic", "active", "relaxed", "uptight", "slack", and "lively". In response to those questions, the psychological state at the time of measurement can be quantified by answering on a 6-point Likert scale, with responses ranging from "not at all" to "very much so". In the experiment of this study, before and after viewing the images for 10 minutes, and the mood change was measured by TDMS-SD and those are compared.

For images related to "kawaii" used for stimulation, the use of The International Affective Picture System (IAPS) was initially considered. IAPS images are accompanied by scores (pleasant / unpleasant, arousal, superiority) when downloaded, so those scores can be used as reference levels for comparison of feelings with pleasant and unpleasant, but images were not scored for "kawaii" impression, so IAPS images were not appropriate for the experiment. Therefore, I decided to use 40 images with which Nittono and Ihara (2017) performed their own image selection for a "kawaii" study and evaluation analysis. I conducted unique selection process and decided to select 6 images each for H images and L images from the 40 images as stimulation images for the experimental task. I randomly presented all images online and obtained image evaluations from respondents by questionnaire. For the survey, 89 people aged between 20 and 50 participated in the survey, and those experiment participants answered questions in terms of "kawaii" impression with a five-point Likert scale ranging from "strongly agree" to "do not agree at all". The evaluation results of the top six H images (Fig. 1) were: image#1: M = 4.602, image#2: M = 4.489, image#3: M = 4.375, image#4: M = 4.318, image#5: M = 4.227, image#6: M = 4.205 (n= 89). The top six L images (Figure 2) were: image#7: M = 1.705, image#8: M = 1.705, image#9: M = 1.716, image#10: M = 1.761, image#11: M = 1.761, image#12: M = 1.761 (n = 89). These images were prepared and printed on a white styrene board with a size of 150mm x 150mm, and 6 images were presented to the participants.

Analysis of variance was conducted by the score of the change of the level of the TDMS-ST on the two factors of "presence or absence of communication" and "whether or not there was kawaii impression" and all analyzes were performed by SPSS.



Figure 1: Selected Six H (=High Impression of "Kawaii") Image From Original Forty Images by Online Survey



Figure 2: Selected Six L (=Low Impression of "Kawaii") Image From Original Forty Images by Online Survey

Results

A two-factor analysis of variance was performed on the change in the level of the TDMS-ST in the H and L image and the conditions of communications in the all participants and gender different of the experiment participants, and the following was confirmed.

Viewing H Image (All Participants)

• Activity: the main effect before and after the task was not significant (F(1,22) = .41, n.s.), and the main effect of the experiment participants was significant (F(1,22) = 10.68, p < .01). The interaction was not significant (F((1,22) = .64, n.s.).

• Stability: the main effects before and after the task and the main effects and interactions of the experiment participants were not significant (F((1,22) = 3.10, ns; F(1,22) = .08, n.s.). F(1,22) = .00, n.s.).

• Comfort: the main effect before and after the task was not significant (F(1,22) = .26, ns), but the main effect of the experiment participants was significant (F(1,22) = 4.41, p < .05). The interaction was not significant (F((1,22) = .39, n.s.).

• Arousal: the main effect before and after the task was not significant (F(1,22) = 2.85, n.s.), but the main effect of the experiment participants was significant (F(1,22) = 13.81, p < .01). The interaction was not significant (F((1,22) = .43, n.s.).

*n.s. means "not significant". (The same applies to the following data)

From the above results, in both the C group and the NC group, the activity, stability, comfort, and arousal of the TDMS-ST did not change before/after the task depending on the content of the image. However, there were significant differences in the levels of activity, comfort, and arousal among the experiment participants, and the levels in the C group were higher than those in the NC group (Figure 3).

					Image: H in	nage		•		
			E	xperiment	participants	: All parti	cipants			
			NC group	o (n=8)	C group	(n=16)	ma	in effect		otoraction
			before	after	before	after	before/after	group condition		Relacton
activ	ity level	м	5.75	4.63	8.13	8.25	.41	10.68 "		.64
		SD	2.05	2.72	2.92	2.98				
stability level		м	6.75	7.75	6.94	8.00	3.10	.08		.00
		SD	2.12	2.77	2.18	2.13		0.000		
comfort level	м	12.50	12.38	15.06	16.25	.26	4.41		.39	
		SD	3.51	4.98	4.49	4.04				
arous	al level	м	-1.00	-3.12	1.19	.25	2.85	13.81 "		43
		SD	2.27	2.30	2.51	3.24	2.00			
p<.01	"p<.05									
25.00 -			25.00			25.00		25.00		1.2.2.2
20.00			20.00			20.00	I I	20.00		NC group
15.00			15.00			15.00	+!	15.00		C group
10.00 -	1	1	10.00	-	1	10.00	F	10.00		
5.00			5.00		1	5.00		5.00	т	Ŧ
.00		1	.00			.00		.00		
-5.00		NC group	-5.00	- NC gro	oup	-5.00	 NC group 	-5.00	1	1
-10.00		C group	-10.00 -	C grou	ıp	10.00 -	- C group	-10.00		
	before	after	b	efore	after	be	fore after		before	after
	activi	ty level		stability lev	el	0	omfort Level		arous	al level

Two-factor analysis (ANOVA) - TDMS-ST score and experimental group condition

Figure 3: ANOVA of TDMS-SD - H Images / All Participants

Viewing L Image (All Participants)

• Activity: the main effects before and after the task and the main effects and interactions of the experiment participants were not significant (F ((1,22) = 4.13, n.s.; F (1,22) = 2.72, n.s.; F (1,22) = .27, n.s.).

• Stability: the main effects before and after the task and the main effects and interactions of the experiment participants were not significant (F(1,22) = 1.62, n.s.; F(1,22) = .26, n.s.). F(1,22) = .07, n.s.).

• Comfort: the main effects before and after the task and the main effects and interactions of the experiment participants were not significant (F ((1,22) = 4.15, n.s.; F (1,22) = 1.77, n.s.; F (1,22) = .24, n.s.).

• Arousal: the main effects before and after the task and the main effects and interactions of the experimental experiment participants were not significant (F(1,22) = 1.22, n.s.; F(1,22) = 2.07, n.s.; F(1,22) = .11, n.s.).

From the above results, TDMS-ST cannot be said to have changed by viewing the L image in C group or the NC group (Figure 4).

				Image: L im	age				
		E	xperiment	participants	: All parti	cipants			
		NC group	p (n=8)	C group	(n=16)	ma	in effect	- interaction	
		before	after	before	after	before/after	before/after group condition		
ty level	м	5.63	4.63	7.88	6.19	4 13	2 72	27	
y lover	SD	2.26	2.50	3.42	3.27	4.10	2.72		
ty level	м	6.38	5.88	6.94	6.19	1.62	26	07	
9 10101	SD	2.13	2.36	2.29	2.32	1.02		.01	
ort level	м	12.00	10.50	14.81	12.38	4 15 1 77		.24	
	SD	3.78	3.93	4.90	5.03	4.10			
al level	м	75	.94	-1.25	.00	1 22	2 07	11	
	SD	2.25	3.15	2.87	2.61	1.22	2.07		
°p≤.05									
		25.00		2	.00		25.00		
		20.00		2	1.00 T		20.00	NC group	
		15.00		1	.00		15.00 -	C group	
1		10.00	T	1	1.00		10.00		
		5.00	+		5.00	1	5.00		
	1	.00			.00		00		
_	NC group	-5.00	- NC g	roup		NC group	-5.00	1	
	C group	10.00	C gro	oup	-	C group	10.00		
before	after	-1010	before	after	befo	re after	befo	re after	
activit	y level		stability le	vel		comfort Level	a	rousal level	
	ty level ty level al level "p <.05	ty level M ty level SD ty level SD ort level SD al level SD p < .05 p < .05	NC group before ty level M SD 2.26 ty level M SD 2.13 ort level M SD 2.13 ort level M SD 3.78 at level SD 2.25 7 p < .05	Experiment NC group (n=8) before nC group (n=8) before before after ty level M 5.63 4.63 SD 2.26 2.50 ty level M 6.38 5.88 SD 2.13 2.36 ort level M 12.00 10.50 ort level SD 3.78 3.93 atal level SD 2.25 3.15 "p < .05	Image: L im Experiment participants NC group (n=8) C group (before before after before ty level M 5.63 4.63 7.88 ty level M 6.38 5.88 6.94 ty level M 6.38 5.88 6.94 ty level M 12.00 10.50 14.81 ort level SD 3.78 3.93 4.90 at level SD 3.78 3.93 4.90 at level SD 2.25 3.15 2.87 "p < .05	Image: L image Experiment participants : All parti NC group (n=8) C group (n=16) before after before after ty level M 5.63 4.63 7.88 6.19 ty level SD 2.26 2.50 3.42 3.27 ty level M 6.38 5.88 6.94 6.19 spin 2.13 2.36 2.29 2.32 ort level M 12.00 10.50 14.81 12.38 spin SD 3.78 3.93 4.90 5.03 atl level SD 3.78 3.93 4.90 5.03 atl level SD 2.25 3.15 2.87 2.61 "p < .05	Image: L image Experiment participants : All participants NC group (n=8) C group (n=16) mai before after before after before/after ty level M 5.63 4.63 7.88 6.19 4.13 ty level SD 2.26 2.50 3.42 3.27 4.13 ty level M 6.38 5.88 6.94 6.19 1.62 sty level SD 2.13 2.36 2.29 2.32 1.62 ort level SD 3.78 3.93 4.90 5.03 4.15 at level SD 3.78 3.93 4.90 5.03 1.22 ial level SD 2.25 3.15 2.87 2.61 1.22 isco isco	Image: L image Experiment participants : All participants NC group (n=8) C group (n=16) main effect before after before after before/after group condition ty level M 5.63 4.63 7.88 6.19 4.13 2.72 ty level M 6.38 5.88 6.94 6.19 1.62 .26 ty level M 6.38 5.88 6.94 6.19 1.62 .26 ty level M 12.00 10.50 14.81 12.38 4.15 1.77 stal level M 12.00 10.50 14.81 12.38 4.15 1.77 stal level SD 3.78 3.93 4.90 5.03 4.15 1.77 stal level SD 2.25 3.15 2.87 2.61 1.22 2.07 main effect SD 5.00 1.22 2.07 5.00 5.00 5.00 5.00	

Two-factor analysis (ANOVA) - TOMS-ST score and experimental group condition

Figure 4: ANOVA of TDMS-SD - L Images / All Participants

Viewing H Image (Male Participants)

Activity: the main effect before and after the task was not significant (F(1,7) = 3.17, ٠ n.s.), and the main effect of the participants was significant (F(1,7) = 40.33, p < .01). The interaction was not significant (F(1,7) = .66, n.s.).

Stability: the main effects before and after the task and the main effects and interactions of the participants were not significant (F ((1,7) = .00, n.s.; F(1,7) = 2.61, n.s.; F(1,7) = .15, n.s.).

Comfort: the main effect before and after the task was not significant (F(1,7) = 2.35, n.s.), and the main effect of the participants was significant (F (1,7) 15.14, p < .01). The interaction was not significant (F(1,7) = .18, n.s.).

Arousal: the main effect before and after the task was not significant (F(1,7) = 1.53, n.s.), but the main effect of the participants was significant (F(1,7) = 14.29, p < .01). The interaction was not significant (F(1,7) = .62, n.s.).

From the above results, the activity, stability, comfort, and arousal of the TDMS-ST cannot be said to change in both the C group and NC group for men by viewing H images. In addition, there were significant differences in the levels of activity, comfort, and arousal among the participants, and the levels in the C group were higher than those in the NC group (Figure 5).

					Ima	ge: H im	age						
			E	xperim	ent parti	cipants :	Male par	ticipants					
			NC grou	up (n=3	3)	C group ((n=6)		mai	n effect		- interaction	
			before	afte	r b	efore	after	before/a	fter	group condition		interaction	
activi	ty lovel	м	3.67	2	2.67	10.00	7.33	3 17 40 33			66		
acum	ly lovel	SD	.58	2	.08	2.37	1.63	0.1	<u> </u>	10.00		.00	
stabil	stability level	м	5.33	5	6.00	7.00	7.33	00		2.61		15	
stability level		SD	1.53	2	.65	1.27	2.73			2.01	3	.10	
comfe	comfort level	м	9.00	7	.67	17.00	14.67	2.35		15.14 "		.18	
Connort Reven	SD	1.73	3	.51	3.58	3.14	2.00		10.14		.10		
arous	arous al level	м	-1.67	-2	.33	3.00	.00	15	3	14.29 "		62	
aious		SD	SD 1.53	3	.22	1.27	3.23	1.0	<u> </u>	14.20		.02	
p<.01	"p<.05												
30.00			30.00							30.00			
25.00			25.00			- 25	5.00			25.00			
20.00			20.00			20	0.00	1		20.00		NC group	
15.00			15.00			- 15	5.00	+	-1	15.00		C group	
10.00	+		10.00		Ι	10	0.00		+	10.00			
5.00		<u>+</u>	5.00				5.00	1		5.00	4		
.00		1	.00		*		.00			.00			
-5.00	_	NC group	-5.00	_	NC group		5.00	NC grou	р	-5.00	1		
10.00		C group	-10.00		C group	-10		C group		-10.00			
	before	after		before	after		be	fore	after		before	after	
	activit	y level		stabili	ity level			comfort]	Leve	I	ar	ousal level	

Two-factor analysis (ANOVA) - TDMS-ST score and experimental group condition

Figure 5: ANOVA of TDMS-SD - H Images / Male Participants

Viewing L Image (Male Participants)

• Activity: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,5) = .04, n.s.; F(1,5) = .40, n.s.; F(1,5) = .40, n.s.; F(1,5) = .22, n.s.).

• Stability: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,5) = 1.78, n.s.; F(1,5) = .06, n.s.; F(1,5) = .33, n.s.).

• Comfort: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,5) = .38, n.s.; F(1,5) = .03, n.s.; F(1,5) = .28, n.s.).

• Arousal: the main effects before and after the task, the main effects of the experimental participants, and the interactions were not significant (F(1,5) = .56, n.s.; F(1,5) = .99, n.s.; F(1,5) = .06, n.s.).

From the above results, it can be seen that in males, viewing the L images did not change the activity, stability, comfort, and arousal of the TDMS-ST in both the C group and the NC group (Figure 6).

				Image: L ima	age				
		E	xperiment pa	articipants :	Male part	icipants			
		NC grou	ip (n=5)	C group ((n=2)	mai	n effect	interaction	
		before	after	before	after	before/after	group condition	Interaction	
activity leve	el M	6.00	5.60	6.50	7.50	04	40	22	
activity for	SD	2.55	2.07	.71	6.36	5 101 110			
stability lev	el M	6.00	6.60	5.00	6.50	1 78	06	33	
ondonný lot	SD	2.65	2.19	2.83	4.95		.00	.00	
comfort level	el M	12.00	12.20	11.50	14.00	38	03	28	
control to	SD SD	4.85	2.95	3.54	11.31	.00	.00	.20	
arousal leve	el M	.00	-1.00	1.50	1.00	56	99	06	
a ousu ior	SD		3.08	2.12	1.41	.00	.00	.00	
p<.01 "p<.0)5								
0.00		30.00		30.00			30.00		
5.00		25.00		25.00		1	25.00		
0.00		20.00		20.00			20.00	NC group	
5.00		15.00		15.00	I		15.00 -	 C group 	
0.00		10.00		I 10.00	-		10.00		
5.00		5.00		5.00	#		5.00		
.00	I	.00	1	1 .00		1	.00		
	- NC group		NC group	5.00	-	NC group	-5.00	1	
	C group		C group	10.00	-	C group	10.00		
before	after	- 2000	before a	ifter - 10.00	before	after	bef	ore after	
act	ivity level		stability lev	el		comfort Leve	1	arousal level	

Two-factor analysis (ANOVA) - TDMS-ST score and wxperimental group conditions

Figure 6: ANOVA of TDMS-SD - L Images / Male Participants

Viewing H Image (Female Participants)

• Activity: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,11) = .01, n.s.; F(1,11) = 1.86, n.s.; F(1,11) = 1.57, n.s.).

• Stability: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,11 = 3.21, n.s.; F(1,11) = .41, n.s.; F(1,11) = .26, n.s.).

• Comfort: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,11) = 1.24, n.s.; F(1,11) = .46, n.s.; F(1,11) = .44, n.s.).

• Arousal: the main effects before and after the task, the main effects of the experimental participants, and the interactions were not significant (F(1,11) = 1.11, n.s.; F(1,11) = 3.78, n.s.; F(1,11) = 1.84, n.s.).

From the above results, the activity, stability, comfort, and arousal of the TDMS-ST cannot be said to change in both the C group and NC group in females by viewing H images (Figure 7).

					Imag	ge:H ima	ige								
			Exp	periment	particip	ants : F	emale pa	rticipants							
			NC grou	p (n=5)	(C group (n=8)	ma	in effect		interaction				
		before af		after	fter efore+B109:P		after	before/after	group conditio	n	interaction				
activity level		м	7.00	5.8	0	7.38	8.75	01	1.86		1 57				
		SD	1.41	2.4	9	2.26	3.85	.01	1.00		1.07				
stability level		м	7.60	9.4	0	7.50	8.50	3 21	41		26				
		SD	2.07	.8	9	2.27	1.93	0.21			.20				
comfort level		м	14.60	15.2	0	14.88	17.25	1 24	1 24	1 24	1 24	1 24	46		44
		SD	2.30	3.2	7	3.64	4.83	1.2.4	.40						
arousal level		м	60	-3.6	0	12	.25	1 11	3.78		1.84				
		SD 2.70		1.8	2	2.70	3.69		0.10		1.04				
p<.01	"p<.05														
0.00			30.00			30.00			30.00						
5.00			25.00			25.00			25.00						
0.00			20.00			20.00		T	20.00		 NC group 				
5.00			15.00			15.00			15.00		 C group 				
0.00		T	10.00			10.00	I	1	10.00						
0.00			5.00						10.00						
5.00		I	5.00	-		5.00			5.00		T				
.00		NC group	.00		NC group	.00	_	NC group	.00	-					
5.00		Cgroup	-5.00		C group	-5.00	-	C group	-5.00		1				
0.00		o Broab	-10.00			-10.00	-		-10.00						
	before	after		Detore	amer		before	arter		befor e	after				
	activit	ty level		stabi	lity level		c	omfort Level		arou	isal level				

Two-factor analysis (ANOVA) - TDMS-ST score and experimental group condition

Figure 7: ANOVA of TDMS-SD - H Images / Female Participants

Viewing L Image (Female Participants)

• Activity: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,11) = 4.65, n.s.; F(1,11) = 2.54, n.s.; F(1,11) = .06, n.s.).

• Stability: the main effects before and after the task, the main effects of the participants, and the interactions were not significant (F(1,11 = 4.28, n.s.; F(1,11) = .02, n.s.; F(1,11) = 1.02, n.s.).

• Comfort: the main effects before and after the task were significant (F(1,11) = 7.67, p < .05), however, the main effects and interactions of the participants were not significant (F(1,11) = 1.27, n.s.; F(1,5) = .14, n.s.).

• Arousal the main effects before and after the task, the main effects of the experimental participants, and the interactions were not significant (F(1,11) = .33, n.s.; F(1,11) = 3.55, n.s.; F(1,5) = .73, n.s.).

Comparing the average levels of comfort before and after viewing the image, it can be said that the score after viewing the image was lower than that before viewing the image, so the comfort was lower (Figure 8).

					Image: L im	age			
			Exp	Image: L image Experiment participants : Female participants NC group (n=3) C group (n=10) main effect interaction before after before after before/after group condition interaction 5.00 3.00 8.00 5.50 4.65 2.54 .06 2.00 2.65 3.68 2.64 .02 1.02 1.00 2.52 2.01 2.22 1.02 12.00 7.67 14.40 11.10 7.67 1.27 .14 1.73 4.16 5.06 4.28 .02 .02 -2.00 -1.67 1.60 10 .33 3.55 .73 2.65 3.06 3.10 2.33 .00 30.00 .					
			Exp before 5.00 2.00 7.00 1.00 12.00 1.73 -2.00 2.65 3000 2.65 3000 2.65 3000 2.00 3000 0.0	o (n=3)	C group (n=10)	ma	in effect	interaction
			before	after	before	after	before/after	group condition	- interaction
activi	tu louol	м	5.00	3.00	8.00	5.50	4.65	2.54	.06
acuv	ity level	SD	2.00	2.65	3.68	2.64			
etabi	ity lawal	м	7.00	4.67	6.40	5.60	4.28	.02	1.02
Stabi	ity level	SD	1.00	2.52	2.01	2.22			
comf	ort lovel	м	12.00	7.67	14.40	11.10	7.67	1.27	.14
COIII	DILIEVEI	SD	1.73	4.16	5.06	4.28	S-1140-11		1947A2PIN
2001	laval lav	м	-2.00	-1.67	1.60	10	.33	3.55	.73
arous	Sai levei	SD	2.65	3.06	3.10	2.33			
°p≤.01	"p<.05								
30.00			30.00		30.0	0		30.00	
25.00			25.00		25.0	0		25.00	NC group
20.00			20.00		20.0	0 T		20.00	C group
15.00			15.00		15.0	•		15.00	
10.00	I		10.00		10.0	o 🕂		10.00	
5.00			5.00	-		0 0		5.00 T	
.00	- C	1	.00			0			
-5.00		NC group	-5.00	NC	group -5.0	0	NC group	-5.00 I	1
10.00		C group	-10.00	C gro	-10.0	-	C group	-10.00	
	hefree	after		hefore	after	hefor	e after	hefore	after
	activity	level		stability le	evel	con	nfort Level	aro	usal level

Two-factor analysis (ANOVA) - TDMS-ST score and experimental group conditions

Figure 8: ANOVA of TDMS-SD - L Images / Female Participants

Finally, among the experimental participants, I targeted a mixed-gender pair in Group C and A two-factor analysis of variance was performed. The purpose of the analysis was to verify whether the results of the male-only or female-only pair and the male-female pair would be different.

Viewing H Image (Pair Participants – Male and Female Together)

• Activity: the main effects before and after the task and the main effects of the experimental participants were not significant (F(1,8) = 1.67, n.s.; F(1,8) = 1.18, n.s), however, the interaction was significant (F(1,8) = 6.31, p < .05.). Since the interaction was significant, a simple main effect test was performed, and there was no significant difference between the C group and NC group before the task and the C group and NC group after the task. In addition, there was no significant difference between the comparison before and after the experiment in the C group and the comparison before and after the task in the NC group.

• Stability: the main effects before and after the task and the main effects and interactions of the participants were not significant (F(1,8) = 4.94, n.s.; F(1,8) = .36, n.s.; F(1,8) = 1.52, n.s.).

• Comfort: the main effects before and after the task were significant (F(1,8) = 9.05, p < .05), however, the main effect of the participants in the experiment was not significant (F(1,8) = .09, n.s.), but the interaction was significant (F(1,8) = 9.72, p < .05). Since the interaction was significant, a simple main effect test I performed, and there was no significant difference between the C group and NC group before the task and the C group and NC group after the task. In addition, although there was no significant difference in the comparison before and after the task in the NC group, in the comparison before and after the task in the C group, the score after the task was significantly higher at the 1% level than before the task.

• Arousal: the main effect before and after the task was not significant (F(1,8) = .46, n.s.), however, the main effect of the participants was significant, (F(1,8) = .46, n.s.) but the interaction was not significant (F(1,8) = 11.75, p < .01).

Comparing the average levels of comfort before and after viewing the image under the mixed pair condition, it can be said that the comfort level increased after viewing the image because the score was higher than before viewing the image. The levels of comfort did not change for the experimental participants of the NC group by viewing the H image, but the level of the experimental participants of the C group increased (Figure 9).

		Two-facto	or analysis (ANOVA) - TI	DMS-ST scor	e and ex	perimental gi	roup conditions	
			Even	imant nartie	Image: H ima	ige	ale together		
			NC grou	n (n =8)	C group (n=2	nale together ma	in effect	
			before	before after		after	before/after	group condition	 interaction
activi	ty level	М	5.75	4.63	5.50	9.00	1.67	1 18	631
activity level		SD	2.05	2.72	4.95	2.83	1.07	1.10	0.01
stabili	tv level	М	6.75	7.75	4.50	8.00	4.94	.36	1.52
	9.0.0.	SD	2.12	2.77	3.54	.00			
comfo	ort level	м	12.50	12.38	10.00	17.00	9.05	.09	9.72
Connortiover		SD	3.51	4.98	8.49	2.83			
arous al level		м	-1.00	-3.12	1.00	1.00	46 11.75		46
aivus	0110401	SD	2.27	2.30	1.41	2.83	.10	11.75	.40
p<.01	"p<.05								
30.00			- 30.00		30.00			30.00	
25.00			25.00		25.00			25.00	NC group
00.05			20.00		20.00		T	20.00 -	C group
15.00			15.00		15.00	-		15.00	
10.00	1		10.00	r	1 10.00	F	-	10.00	
5.00			5.00		5.00	-	*	5.00	T
.00		1	.00	1	.00	1		.00	
-5.00		NC group	-5.00	- NC gr	oup -5.00	_	NC group	-5.001	1
10.00		 C group 	-10.00	C group	-10.00	-	C group	-10.00	
	before	after		before	after	before	after	befo	ore after
	activit	y level		stability le	vel	con	nfort Level	1	arousal level

Figure 9: ANOVA of TDMS-SD - H Images / Pair of Male and Female Participants

Viewing L Image (Pair Participants – Male and Female Together)

• Activity: the main effects before and after the task, the main effects of the participants, and the interactions were not significant. (F(1,10 = 1.62, n.s.; F(1,10) = 2.62, n.s.; F(1,10) = .00, n.s.).

• Stability: the main effects before and after the task were not significant (F(1,10) = 3.02, n.s.), however, the main effect of the participants was significant (F(1,10) = 5.18, p < .05), and the interaction was not significant (F(1,10) = .93, n.s.).

• Comfort: the main effects before and after the task were not significant (F(1,10) = 2.73, n.s.), however, the main effect of the participants was significant (F(1,10) = 5.57, p < .05), and the interaction was not significant (F(1,10) = .24, n.s.).

• Arousal: the main effects before and after the task, the main effects of the experimental collaborators, and the interactions were not significant (F(1,10 = .04, n.s.; F(1,10) = .05, n.s.; F(1,10) = .93, n.s.).

From the above results, the L image did not change the activity, stability, comfort, and arousal of the two-dimensional mood scale in either the C group or the NC group.

In addition, there was a significant difference in the scores of the experiment participants in terms of stability and comfort, and the scores of the male and female pair of experimental

participants were higher than those of the other experimental participants in C group (Figure 10).

					Im	age: L im	age					
			Expe	rimen	t participa	ants :Male	and fem	ale together	2			
			NC grou	up (n =	8)	C group	(n=4)	ma	in effect		interaction	
			before	afte	er	before	after	before/after	group cond	ition	interaction	
activity level		Average	5.63		4.63	8.25	7.25	1.62	1.62 2.62		00	
		SD	2.26		2.50	4.03	3.86	1.02			.00	
stability	level v	Average	6.38		5.88	9.25	7.50	3.02	3.02 5.18 *		.93	
o tu o int	,	SD	2.13		2.36	.96	.58	0.01				
comfort level		Average	12.00	1	0.50	17.50	14.75	2.73	5.5	7.	24	
		SD	3.78		3.93	4.66	3.78	2.10	0.01			
arousal level		Average	75	-	1.25	-1.00	25	04	.05		93	
arouse	a lover	SD	2.25		.29	3.56	4.03			<u> </u>		
p<.01	p<.05											
0.00			30.00			30.00			30.00			
5.00			25.00			25.00			25.00		 NC group 	
.00			20.00			20.00			20.00		 C group 	
.00			15.00			15.00	+-	·[15.00			
1.00	T	T	10.00			10.00	-		10.00			
00	+		5.00	-		10.00		1	6.00			
	1	1		1	1	5.00			5.00	Ŧ	T	
.00	- 14	NC moun	.00	_	- NC group	.00		NC amount	.00	+		
.00		C group	-5.00		- C group	-5.00		- Cercen	-5.00	1		
.00		C Brook	-10.00			-10.00		- C Broup	-10.00			
	before	after	5	enore	after		before	after		before	after	

Figure 10: ANOVA of TDMS-SD - L Images / Pair of Male and Female Participants

Discussion

From the analysis of variance on all the participants, the levels of activity, comfort, and arousal were high in the group who viewed and communicated about the "kawaii" images. The result of those were higher on all levels of short-term mood in the group of single participants who viewed. In this group, the participants felt a lively and energetic feeling after viewing the images with a high impression of "kawaii", and felt comfortable, cheerful, excited and lively. However, they did not become relaxed and calm. On the other hand, for the group that viewed images with few "kawaii" elements, the levels of activity, comfort, and arousal had no correlation with the presence or absence of communication, and the effect on mood changes was small. From this, it is suggested that by viewing "kawaii" images and sharing that emotion with people, the short-term mood can be made comfortable and cheerful. From this result, the act of sharing the feelings with others while viewing images related to "kawaii" activates and amplifies the mood of joy in the short term more than the case of not sharing the internalized feelings toward a "kawaii" subject. This suggests that the feeling of "kawaii" can be amplified by sharing it with others. When viewing an image with a low "kawaii" impression, there was no change in short-term mood after viewing the image regardless of communication, so it suggests it is only the object that gives a positive stimulus and creates a pleasant feeling. Furthermore, in the gender comparison, in the case of males, in the group with communication, the levels of activity, comfort, and arousal increased by viewing images with a high impression of "kawaii". However, there was no effect on the short-term mood for images with a low impression of "kawaii". This is almost the same result as the result of all the experiment participants. On the other hand, in the case of females, unlike both the analysis results of all the experimental participants and the analysis results of males, viewing images with a high impression of "kawaii" depending on the presence or absence of communication did not affect short-term mood. However, when viewing images with a low impression of "kawaii, the comfort level decreased. In a previous study by Kanai

et al. (2015), it was stated that women have higher empathy than men. Therefore, before the experiment, the result was predicted that positive effects in short-term mood would be created in females viewing and communicating about "kawaii" images. However, looking at the results, the effect on short-term mood before and after the task was less than that of males, depending on the presence or absence of communication. However, the negative reaction was seen only for viewing images with a low impression of "kawaii". From this result, it is not possible to conclude that female empathy has a strong effect when communicating when viewing "kawaii" images. Under the pair conditions, regarding the viewing of images than before viewing the images. When viewing images with a low "kawaii" impression, not only stability but also comfort was improved, and the scores of the experimental participants of the male and female (mixed) pairs were generally higher when compared with other pairs. It was found that communication is effective in creating a positive psychological state for mix-gendered pairs.

Conclusion

If it were simply just in praise of beautiful things and an expression of affection for adorable beings, the word "kawaii" would not have spread around the world. The word "kawaii" has a broad meaning and does not fit into a narrow category, and it is a word with ambiguous language boundaries that can convey various emotions. It's easy to understand each other as long as the word "kawaii" conveys empathy. With the use of SNS, platforms on which one can share emotions, the word "kawaii" is no longer unique to Japan, and the circle of empathy has expanded. The emotional expression "kawaii" derived from an unexpected place, and the variety and range of expressions has expanded. And many people are unconsciously beginning to recognize that the linguistic communication of "kawaii" is connected to psychological pleasure. The utterance of "kawaii" is accompanied by empathy and facilitates interpersonal relationships, resulting in a chain of positive emotions. Communicating with others by looking at specific images and speaking from those perspectives is thought to be effective in clinical psychology, such as in the treatment of depression and dementia. Communication related to "kawaii" image can be deeply related to memory and empathy. In communication with utterances, people perform complex tasks using past memories and the vocabulary and grammar they have learned. Not only that, observing the reaction of the other person and pondering the next utterance while being concerned about communication with others is a task that requires processing a large amount of data in the brain. There is no doubt that the short-term mood will be affected by the activation of the brain by organizing and verbalizing sympathetic feelings for an object by utterance and communicating with others. In the future, it is necessary to study from a broad perspective.

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