Effects of Personality and Situational Factors on Waiting Behavior in Female University Students

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Abstract:

Study 1 investigated the effects of cognitive reflectiveness as a personality factor and both waiting place and waiting time as situational factors on waiting behavior in female university students. Two questionnaires, a cognitive reflectiveness scale and a waiting questionnaire, were administered to female university students. Regarding the waiting questionnaire, students rated their anticipated frustration, the value of the waiting object,and their waiting behavior for six hypothetical waiting situations involving different waiting places (a bookshop or a park) and times (5, 30, or 60 minutes). The results suggested main effects of waiting place and waiting time and an interaction effect between waiting place and waiting time. Study 2 investigated the effects of achievement motive as a personality factor and both waiting place and waiting as the situational factors on the waiting behavior among female university students. Two questionnaires, an achievement motive questionnaire and a waiting questionnaire, were administered to female university students. The results suggested a main effect of waiting place and waiting time and an interaction effect between waiting place and waiting time for waiting scores. No main effects of personality factors or interaction effects between personality and situational factors were observed in either study.

Key words: waiting behavior, waiting place, waiting time, cognitive reflectiveness, achievement motive

To investigate the effects of situational factors on waiting behavior, a series of studies (Mitsutomi & Kobayashi, 2012; Mitsutomi & Kobayashi, 2014; Mitsutomi, Kobayashi & Fukuhara, 2015) was conducted in which female university students waited for an object in a variety of hypothetical waiting situations. As a result, a number of the following situational factors were found to affect waiting behavior.

First, students had higher waiting scores when the degree of intimacy with the waiting object was higher. Second, regarding waiting place, the bookshop condition, which is associated with numerous distractions, resulted in higher waiting scores than the park condition, which is associated with relatively few distractions. Third, longer waiting time resulted in lower waiting scores.

We interpreted these results using a cognitive value evaluation model that assumes that the frustration resulting from waiting leads to a reduced value evaluation of the waiting object by the subjects, who consequently discontinue their waiting behavior. As the present study utilized a hypothetical waiting situation, we changed actual frustration to anticipated frustration.

In the purpose section, Mitsutomi & Kobayashi (2016) and Mitsutomi & Kobayashi (2018) interpreted the results regarding the intimacy of the waiting object using a cognitive value evaluation model. In these papers, we regard the intimacy factor as the between factors. However, this is within factor. Furthermore, is difficult for the reader to understand this sentence. On the basis of original paper, we revised as follows. See the note.

We also used a cognitive value evaluation model to interpret the results regarding waiting place. The subjects did not anticipate a stronger feeling of frustration in the bookshop condition, which is associated with numerous distractions, compared with the park condition, which is associated with relatively few distractions. Therefore, the value of the waiting object tended to be higher in the bookshop than in the park condition,

which led to higher waiting scores for the bookshop condition.

In addition, we interpreted the results regarding waiting time using a cognitive value evaluation model. A longer waiting time led to a stronger feeling of anticipated frustration and consequently, a lower value for the waiting object. Therefore, longer waiting times might result in lower waiting scores.

Previous studies (Mitsutomi & Kobayashi, 2012, Mitsutomi & Kobayashi, 2014, Mitsutomi & Kobayashi, & Fukuhara, 2015) have primarily focused on situational factors. However, to investigate the way in which personality factors interact with situational factors, it is necessary to examine not only situational factors, such as the level of intimacy with a waiting object, waiting place, and waiting time, but also personality factors that influence waiting behavior.

Mitsutomi and Kobayashi (2016) conceptualized aggressiveness as a personality factor and both waiting place and waiting time as situational factors. However, concerning the main effect of aggressiveness and the interaction effects between aggressiveness and situational factors such as waiting place and waiting time, no interpretable results were obtained.

Mitsutomi and Kobayashi (2018) used a coronary prone behavior pattern consisting of hostility, perfectionism, and workaholism instead of aggressiveness. Therefore, we conceptualized a coronary prone behavior pattern as a personality factor and both waiting place and waiting time as situational factors.

The interaction effect for the value of waiting object and waiting behavior between perfectionism and waiting time was observed. In the 60-minute condition, the high perfectionism group evaluated friends who made them wait for 60 minutes, i.e., loose friends, more negatively and had lower waiting scores than did the low perfectionism group.

However, compared with friends who make the subject wait for 60 minutes, those who make the subject wait for 5 or 30 minutes might not be so loose. Therefore, the high perfectionism group did not evaluate such friends very negatively.

Similarly, the low perfectionism group did not evaluate friends who made them wait for 5 or 30 minutes very negatively. Therefore, no differences in waiting scores were observed for 5 or 30 minutes between the high and low perfectionism groups. Thus, an interaction effect was observed between perfectionism as a personality factor and waiting time as a situational factor.

The purpose of this research was to investigate the effects of personality and situational factors on waiting behavior. Two studies were conducted. Study 1 conceptualized cognitive reflectiveness and impulsiveness as personality factors and waiting place and waiting time as situational factors, whereas Study 2 conceptualized the achievement motive as a personality factor and waiting place and waiting time as situational factors.

Study 1

The purpose of Study 1 was to investigate the effects of cognitive reflectiveness,waiting place, and waiting time on waiting behavior.

Method

Experimental design

The experiment used a 2 × 2 × 3 factorial design. The first factor was degree of cognitive reflectiveness and consisted of a high (H) and a low (L) reflectiveness group. The second factor was waiting place and consisted of either a bookshop or a park condition. The third was waiting time and consisted of the following three waiting times: 5, 30, or 60 minutes. For the reflectiveness H and L groups, we devised six hypothetical

waiting situations using a combination of various waiting places and times.

Participants

The 50 study participants were female Christian university students

Qestionnaire (1) The 10-item cognitive reflectiveness‐impulsiveness scale devised by Takigiku and Sakamoto (1991) was administered to the study participants. Participants responded to this scale, using the four point scale.

Questionnaire (2) The waiting questionnaire consisted of a hypothetical waiting situation for which students were asked to respond using a 3-point scale (wait, not sure, do not wait). Each hypothetical waiting situation was described in detail. The basic form of the waiting situation was as follows: You have agreed to meet a casual female friend at a specific place (waiting place). You have waited for a specified number of minutes (waiting time), but your casual female friend has still not arrived.

We devised six hypothetical waiting situations with various combinations of waiting places (a bookshop or a park) and waiting times (5, 30, or 60 minutes). The waiting place was described in detail at the top of the questionnaire. For the park, we explained that there was only one bench at which to wait, and for the bookshop, we explained that it contained a large variety of books that they could browse through and read freely.

The information regarding the waiting place and waiting time was printed in Gothic type. The students were asked to rate their level of anticipated frustration, their value for the waiting object, and their waiting behavior for the hypothetical waiting situations. First, they were asked to rate their level of anticipated frustration on a 7-point scale. The questionnaire item was as follows: How much do you experience iraira (frustration) when you are kept waiting for (waiting time: 5, 30, or 60 minutes) in a (waiting place: park or bookshop) by a casual female friend? Please anticipate.

Second, the value of the waiting object was also rated on a 7-point scale. The questionnaire item was as follows: How much would you dislike a casual female friend who made you wait for (waiting time: 5, 30, or 60 minutes) in a (waiting place: park or bookshop)?

Finally, waiting behavior was rated on a 3-point scale (wait, not sure, do not wait). The questionnaire item was as follows; Would you continue waiting for a casual female friend after you have already waited for (waiting time; 5, 30, or 60 minutes) in a (waiting place: park or bookshop)?

Procedure

The survey was administered in the student’s classroom and took about 30 minutes to complete.

Results

Students with cognitive reflectiveness scores above and below the median were classified into the cognitive reflectiveness H and L groups. The H group significantly had the higher cognitive reflectiveness scores than L group. Table 1 shows the mean anticipated frustration scores for both groups. Using anticipated frustration scores as the dependent variable, analysis of variance (ANOVA) was performed as follows: 2 (reflectiveness) × 2 (waiting place) × 3 (waiting time). The main effects of waiting place ($F=66.73$, $df=1/48$, $p<.01$) and waiting time ($F=222.30$, $df=2/96$, $p<.01$) were significant. The 5-minute waiting condition resulted in lower anticipated frustration scores than did the other two waiting conditions (30 minutes: $t=13.40$, $df=96$, $p<.01$; 60 minutes: $t=20.18$, $df=96$, $p<.01$), and the 30-minute condition resulted in lower anticipated frustration scores than did the 60-minute condition ($t=7.42$, $df=96$, $p<.01$).

Table 1　The mean anticipated frustration strength for reflectiveness H and L groups

	Reflection H group		Reflection L group	
	Park	Bookshop	Park	Bookshop
5-minute	2.19	1.61	2.33	1.58
	(1.49)	(0.88)	(1.18)	(0.86)
30-minute	4.42	2.96	4.83	3.25
	(1.47)	(1.61)	(1.11)	(1.47)
60-minute	5.19	4.26	5.91	4.38
	(1.77)	(1.79)	(1.52)	(1.84)

The interaction effect ($F=7.55$, $df=2/96$, $p<.01$) between waiting place and waiting time was significant. The simple main effect of waiting place was analyzed for each waiting time condition. The bookshop condition resulted in significantly lower anticipated frustration scores than did the park condition for all three waiting times (5 minutes: $F=12.13$, $df=1/144$, $p<.01$ 30 minutes: $F=63.85$, $df=1/144$, $p<.01$; 60 minutes: $F=41.84$, $df=1/144$, $p<.01$). The simple main effect of waiting time was analyzed for each waiting place condition. The simple main effect of waiting time was significant for both conditions (park: $F=171.85$, $df=2/192$, $p<.01$; bookshop: $F=110.95$, $df=2/192$, $p<.01$).

For the park condition, the 5-minute waiting condition resulted in lower anticipated scores than did the other two waiting conditions (30 minutes: $t=12.93$, $df=192$, $p<.01$; 60 minutes: $t=17.99$, $df=192$, $p<.01$), and the 30-minute waiting condition resulted in lower anticipated frustration scores than did the 60-minute waiting condition ($t=5.07$, $df=192$, $p<.01$). For the bookshop condition, the 5-minute condition resulted in lower anticipated frustration scores than did the other two conditions (30 minutes: $t=8.23$, $df=192$, $p<.01$; 60 minutes: $t=14.88$, $df=192$, $p<.01$), and the 30-minute waiting condition resulted in lower anticipated frustration scores than did the 60-minute waiting condition ($t=6.65$, $df=192$, $p<.01$).

Table 2　The mean value scores of waiting object for reflectiveness H and L groups

	Reflection H group		Reflection L group	
	Park	Bookshop	Park	Bookshop
5-minute	5.11	5.42	5.25	5.75
	(1.18)	(1.15)	(1.33)	(1.26)
30-minute	4.11	4.85	4.37	5.08
	(1.22)	(1.09)	(1.57)	(1.49)
60-minute	3.65	4.00	3.75	4.58
	(1.49)	(1.30)	(1.67)	(1.75)

Table 2 shows the mean scores for the value of the waiting object for the cognitive reflectiveness H and L groups. Using the value scores of the waiting object as the dependent variable, ANOVA was performed as follows: 2 (reflectiveness) × 2 (waiting place) × 3 (waiting time).

The main effects of waiting place ($F=31.52$, $df=1/48$, $p<.01$) and waiting time ($F=51.88$, $df=2/96$, $p<.01$)

were significant. The 5-minute waiting condition resulted in a higher value for the waiting object than did the other two waiting conditions (30 minutes: t=5.71, df=96, p<.01; 60 minutes: t=10.17, df=96, p<.01), and the 30-minute waiting condition resulted in a higher value for the waiting object than did the 60-minute waiting condition (t=4.45, df=96, p<.01).

The interaction effect between waiting place and waiting time approached significance. The simple main effect of waiting place was analyzed for each waiting time. The effect of waiting place was significant for all waiting times (5 minutes: F=9.70, df=1/144, p<.01; 30 minutes: F=30.82, df=1/144, p<.01; 60 minutes: F=20.69, df=1/144, p<.01), and the bookshop condition resulted in a higher value for the waiting object than did the park condition. The simple main effect of waiting time was then analyzed for each waiting place condition. The effect of waiting time was significant for both conditions (park: F=47.75, df=2/192, p<.01; bookshop: F=35.68, df=2/192, p<.01).

For the park condition, the 5-minute waiting condition resulted in a higher value for the waiting object than did the other two waiting conditions (30 minutes: t=6.12, df=192, p<.01; 60 minutes: t=9.66, df=192, p<.01), and the 30-minute waiting condition resulted in a higher value for the waiting object than did the 60-minute waiting condition (t=3.54, df=192, p<.01). For the bookshop condition, the 5-minute waiting condition resulted in a higher value for the waiting object than did the other two waiting conditions (30 minutes: t=4.06, df=192, p<.01; 60 minutes: t=8.45, df=192, p<.01), and the 30-minute waiting condition resulted in a higher value for the waiting object than did the 60-minute waiting condition (t=4.39, df=192, p<.01).

Table 3　The mean waiting scores for reflectiveness H and L groups

	Reflection H group		Reflection L group	
	Park	Bookshop	Park	Bookshop
5-minute	1.96	2.00	1.92	2.00
	(0.19)	(0.00)	(0.27)	(0.00)
30-minute	1.42	1.92	1.29	1.67
	(0.63)	(0.27)	(0.74)	(0.55)
60-minute	0.88	1.30	1.00	1.08
	(0.85)	(0.72)	(0.81)	(0.81)

Table 3 shows the mean waiting scores for the cognitive reflectiveness H and L groups. Using the waiting scores as the dependent variable, ANOVA was performed as follows: 2 (reflectiveness) × 2 (waiting place) × 3 (waiting time). The main effects of waiting place (F=28.85, df=1/48, p<.01) and waiting time (F=58.30, df=2/96, p<.01) were significant. The 5-minute waiting condition resulted in a higher waiting score than did the other two waiting conditions (30 minutes: t=4.71, df=96, p<.01; 60 minutes: t=10.77, df=96, p<.01), and the 30-minute waiting condition resulted in higher waiting scores than did the 60-minute waiting condition (t=6.07, df=6.07, p<.01).

The interaction effect between waiting time and waiting place was significant (F=8.73, df=2/96, p<.01). The simple main effect of waiting place was significant for the 30- and 60-minute waiting conditions (30 minutes: F=39.02, df=1/144, p<.01; 60 minutes: F=13.13, df=1/144, p<.01), and the bookshop condition resulted in a higher waiting score than did the park condition. The simple main effect of waiting time was significant for both waiting place conditions (park: F=55.57, df=2/192, p<.01; bookshop: F=2/192, df=2/192, p<.01).

For the park condition, the 5-minute waiting condition resulted in a higher waiting score than did the other

two waiting conditions (30 minutes: t=6.12, df=192, p<.01; 60 minutes: t=10.50, df=192, p<.01), and the 30-minute waiting condition resulted in a higher waiting score than did the 60-minute waiting condition (t=4.37, df=192, p<.01). For the bookshop condition, the 5-minute waiting condition resulted in a higher waiting score than did the other two waiting conditions (30 minutes: t=2.16, df=192, p<.05; 60 minutes: t=8.47, df=192, p<.01), and the 30-minute waiting condition resulted in a higher waiting score than did the 60-minute waiting condition (t=6.32, df=192, p<.01).

Discussion

In the 5-minute condition, a significant difference in anticipated frustration and the value of the waiting object was observed between the park and bookshop conditions. However, in the park condition, the strength of the anticipated frustration was already lower and the value of the waiting object was already higher. Therefore, the difference in anticipated frustration between bookshop and park condition might be small and the difference in value of waiting object between park and bookshop conditions might be small. Therefore, the difference in waiting scores was not observed between the park and bookshop conditions for the 5-minute condition. These results might support the cognitive value evaluation model.

However, with increased waiting time, anticipated frustration increased and the value of the waiting object and waiting scores decreased. In the 30- and 60-minute conditions, the bookshop condition, which is assumed to involve more distractions, was associated with lower anticipated frustration than park condition Then, this difference might be large. Furthermore, the bookshop condition had higher value of the waiting object than park condition and this difference was large. Thus, bookshop condition had the higher waiting score than park condition. These results suggest the validity of the cognitive value evaluation model.

Study 2

The purpose of Study 2 was to investigate the effects of achievement motive, waiting place, and waiting time on waiting behavior.

Method

Participants

The 31 study participants were female Christian university students.

Questionnaire (1)

The achievement motive scale devised by Horino (1987) was administered to female university students. This scale is composed of a 13-item self-fulfilmentive achievement motive subscale and a 10-item competitive achievement motive subscale. Participants respond to this scale, using the seven point scale.

Questionnaire (2)

The waiting questionnaire was the same as that used in Study 1.

Results

Analysis was performed as follows for each subscale of the achievement motive scale.

Self-fulfilmentive achievement motive

Students with self-fulfilmentive achievement motive scores above and below the median were classified into self-fulfilmentive achievement motive H and L groups, respectively. The H group significantly had the higher achievement motive scores than L group.

Table 4 The mean anticipated frustration strength for self-fulfilmentive achievement motive H and L group

	Achievement motive H group		Achievement motive L group	
	Park	Bookshop	Park	Bookshop
5-minute	1.41	1.23	2.58	1.67
	(0.77)	(0.73)	(1.44)	(0.94)
30-minute	3.77	2.59	4.08	3.08
	(1.59)	(1.54)	(1.66)	(1.44)
60-minute	4.35	3.41	5.50	4.16
	(1.91)	(2.06)	(1.32)	(1.72)

Table 4 shows the mean anticipated frustration scores for the self-fulfilmentive achievement motive H and L groups. Using anticipated frustration scores as the dependent variable, ANOVA was performed as follows: 2 (achievement motive) × 2 (waiting place) × 3 (waiting time). The main effects of waiting place ($F=66.50$, $df=1/29$, $p<.01$) and waiting time ($F=64.60$, $df=2/58$, $p<.01$) were significant. The 5-minute waiting condition resulted in lower anticipated frustration scores than did the other two waiting conditions (30 minutes: $t=7.18$, $df=58$, $p<.01$; 60 minutes: $t=11.41$, $df=58$, $p<.01$), and the 30-minute waiting condition resulted in lower anticipated frustration scores than did the 60-minute waiting condition ($t=4.23$, $df=58$, $p<.01$).

Table 5 The mean value scores of waiting object for self-fulfilmentive achievement motive H and L group

	Achievement motive H group		Achievement motive L group	
	Park	Bookshop	Park	Bookshop
5-minute	5.42	5.73	5.41	5.75
	(1.04)	(1.12)	(1.32)	(1.01)
30-minute	4.68	4.95	4.66	5.17
	(1.49)	(1.32)	(1.65)	(1.40)
60-minute	4.15	4.42	4.50	5.08
	(1.72)	(1.57)	(1.76)	(1.61)

Table 5 shows the mean scores for the value of the waiting object for the self-fulfilmentive achievement motive H and L groups. ANOVA was performed as follows: 2 (achievement motive) × 2 (waiting place) × 3 (waiting time). The main effects of waiting place ($F=10.52$, $df=1/29$, $p<.01$) and waiting time ($F=16.38$, $df=2/58$, $p<.01$) were significant. The 5-minute waiting condition resulted in a higher value for the waiting object than did the other two waiting conditions (30 minutes: $t=3.94$, $df=58$, $p<.01$; 60 minutes: $t=5.74$, $df=58$, $p<.01$), and the 30-minute waiting condition resulted in a higher value for the waiting object than did the 60-minute waiting condition ($t=1.80$, $df=58$, $p=.07$).

Table 6　The mean waiting scores for self-fulfilmentive achievement motive H and L groups

	Achievement motive H group		Achievement motive L group	
	Park	Bookshop	Park	Bookshop
5-minute	1.94	1.95	2.00	2.00
	(0.22)	(0.22)	(0.00)	(0.00)
30-minute	1.37	1.68	1.50	1.67
	(0.66)	(0.57)	(0.65)	(0.47)
60-minute	1.00	1.32	1.08	1.16
	(0.79)	(0.65)	(0.76)	(0.89)

Table 6 shows the mean waiting scores for the self-fulfilmentive achievement motive H and L groups. Using the waiting scores as the dependent variable, ANOVA was performed as follows: 2 (achievement motive) × 2 (waiting place) × 3 (waiting time). The main effects of waiting place ($F=5.78$, $df=1/29$, $p<.05$) and waiting time ($F=30.13$, $df=2/58$, $p<.01$) were significant. The 5-minute waiting condition resulted in higher waiting scores than did the other two waiting conditions (30 minutes: $t=4.01$, $df=58$, $p<.01$; 60 minutes: $t=7.96$, $df=58$, $p<.01$), and the 30-minute waiting condition resulted in higher waiting scores than did the 60-minute waiting condition ($t=3.95$, $df=58$, $p<.01$).

The interaction effects between waiting place and waiting time approached significance ($F=3.07$, $df=2/58$, $p=.06$). The simple main effect of waiting place was then analyzed for each waiting time condition. The effects of waiting place were significant for the 30- and 60-minute waiting conditions (30 minutes: $F=7.93$, $df=1/87$, $p<.01$; 60 minutes: $F=5.42$, $df=1/87$, $p<.05$), and the bookshop condition resulted in higher waiting scores than did the park condition. The simple main effect of waiting time was then analyzed for each waiting place condition. The effect of waiting time was significant for both conditions (park: $F=30.84$, $df=2/116$, $p<.01$; bookshop: $F=19.10$, $df=2/116$, $p<.01$).

For the park condition, the 5-minute waiting condition resulted in a higher waiting score than did the other two waiting conditions (30 minutes: $t=4.64$, $df=116$, $p<.01$; 60 minutes: $t=8.02$, $df=116$, $p<.01$), and the 30-minute waiting condition resulted in a higher waiting score than did the 60-minute waiting condition ($t=3.38$, $df=116$, $p<.01$). For the bookshop condition, the 5-minute waiting condition resulted in a higher waiting score than did the other two waiting conditions (30 minutes: $t=2.56$, $df=116$, $p<.01$; 60 minutes: $t=6.31$, $df=116$, $p<.01$), and the 30-minute waiting condition resulted in a higher waiting score than did the 60-minute waiting condition ($t=3.74$, $df=116$, $p<.01$).

Competitive achievement motive

Students with competitive achievement motive scores above and below the median were classified into competitive achievement motive H and L groups, respectively. The H group significantly had the higher achievement motive scores than L group. Table 7 shows the mean anticipated frustration scores for the competitive achievement motive H and L groups. Using the mean anticipated frustration score as the dependent variable, ANOVA was performed as follows: 2 (achievement motive) × 2 (waiting place) × 3 (waiting time). The main effects of waiting time ($F=75.42$, $df=2/58$, $p<.01$) and waiting place ($F=58.50$, $df=1/29$, $p<.01$) were significant.

Table 7　The means of anticipated frustrarion strength for competitive achievement motive H and L groups

	Achievement motive H group		Achievement motive L group	
	Park	Bookshop	Park	Bookshop
5-minute	1.87	1.63	1.93	1.26
	(1.21)	(0.99)	(1.12)	(0.57)
30-minute	4.38	3.00	3.46	2.73
	(1.21)	(1.50)	(1.78)	(1.48)
60-minute	5.06	4.06	4.66	3.60
	(1.35)	(1.78)	(2.05)	(2.09)

The 5-minute waiting condition resulted in lower anticipated frustration scores than did the other two waiting conditions (30 minutes: $t=7.79$, $df=58$, $p<.01$; 60 minutes: $t=12.12$, $df=58$, $p<.01$), and the 30-minute waiting condition resulted in lower anticipated frustration scores than did the 60-minute waiting condition ($t=4.32$, $df=58$, $p<.01$). The interaction effect between waiting place and waiting time approached significance ($F=2.91$, $df=2/58$, $p=.06$).

The simple main effect of waiting place was analyzed for each waiting time condition. The bookshop condition resulted in significantly lower anticipated frustration scores than did the park condition for all three waiting times (5 minutes: $F=5.45$, $df=1/87$, $p<.05$; 30 minutes: $F=28.80$, $df=1/87$, $p<.01$; 60 minutes: $F=27.68$, $df=1/87$, $p<.01$). The effect of waiting time was then analyzed for each waiting place condition.

The effect of waiting time was significant for both conditions (park: $F=66.90$, $df=2/116$, $p<.01$; bookshop: $F=42.13$, $df=2/116$, $p<.01$). For the park condition, the 5-waiting condition resulted in lower anticipated frustration scores than did the other two waiting conditions (30 minutes: $t=7.71$, $df=116$, $p<.01$; 60 minutes: $t=11.33$, $df=116$, $p<.01$), and the 30-minute waiting condition resulted in lower anticipated frustration scores than did the 60-minute waiting condition ($t=3.61$, $df=116$, $p<.01$). For the bookshop condition, the 5-minute waiting condition resulted in lower anticipated frustration scores than did the other two waiting conditions (30 minutes: $t=5.44$, $df=116$, $p<.01$; 60 minutes: $t=9.12$, $df=116$, $p<.01$), and the 30-minute waiting condition resulted in lower anticipated frustration scores than did the 60-minute waiting condition ($t=3.69$, $df=116$, $p<.01$).

Table 8　The mean of value scores of waiting object for competitive achievement motive H and L groups

	Achievement motive H group		Achievement motive L group	
	Park	Bookshop	Park	Bookshop
5-minute	5.00	5.31	5.73	6.20
	(1.17)	(1.16)	(1.18)	(0.74)
30-minute	4.37	4.69	4.93	5.40
	(1.45)	(1.21)	(1.69)	(1.40)
60-minute	3.81	4.25	4.53	5.13
	(1.67)	(1.34)	(1.63)	(1.75)

Table 8 shows the mean scores for the value of the waiting object for the competitive achievement motive H

and L groups. Using the value scores of the waiting object as the dependent variable, ANOVA was performed as follows: 2 (achievement motive) × 2 (waiting place) × 3 (waiting time). The main effect of achievement motive approached significance (F=2.91, df=1/29, p=.09). The main effects of waiting place (F=8.37, df=1/29, p<.01) and waiting time (F=22.11, df=2/58, p<.01) were significant. The 5-minute waiting condition resulted in higher value scores for the waiting object than did the other two waiting conditions (30 minutes: t=4.15, df=58, p<.01; 60 minutes: t=6.57, df=58, p<.01), and the 30-minute waiting condition resulted in higher value scores for the waiting object than did the 60-minute waiting condition (t=2.43, df=58, p<.05).

Table 9 The mean waiting scores for competitive achievement motive H and L groups

	Achievement motive H group		Achievement motive L group	
	Park	Bookshop	Park	Bookshop
5-minute	1.93	1.94	2.00	2.00
	(0.24)	(0.24)	(0.00)	(0.00)
30-minute	1.43	1.75	1.26	1.67
	(0.60)	(0.43)	(0.68)	(0.60)
60-minute	1.06	1.25	0.86	1.26
	(0.74)	(0.75)	(0.72)	(0.77)

Table 9 shows the mean waiting scores for the competitive achievement motive H and L groups. Using the waiting scores as the dependent variable, ANOVA was performed as follows: 2 (achievement motive) × 2 (waiting place) × 3 (waiting time). The main effects of waiting place (F=10.42, df=1/29, p<.01) and waiting time (F=37.29, df=2/58, p<.01) were significant. The 5-minute waiting condition resulted in higher waiting scores than did the other two waiting conditions (30 minutes: t=4.42, df=58, p<.01; 60 minutes: t=8.64, df=58, p<.01), and the 30-minute waiting condition resulted in higher waiting scores than did the 60-minute waiting condition (t=4.22, df=58, p<.01).

The interaction effect between waiting place and waiting time was significant (F=5.94, df=2/58, p<.01). The simple main effect of waiting place was then analyzed for each waiting time condition. The effect of waiting place was significant for the 30- and 60-minute waiting conditions (30 minutes: F =14.82, df=1/87, p<.01; 60 minutes: F=10.08, df=1/87, p<.01), and the bookshop condition resulted in higher waiting scores than did the park condition. The simple main effect of waiting time was significant for both conditions (park: F=39.76, df=2/116, p<.01; bookshop: F=20.03, df=2/116, p<.01).

For the park condition, the 5-minute waiting condition resulted in higher waiting scores than did the other two waiting conditions (30 minutes: t=5.43, df=116, p<.01; 60 minutes: t=8.84, df=116, p<.01), and the 30-minute waiting condition resulted in higher waiting scores than did the 60-minute waiting condition (t=3.42, df=116, p<.01). For the bookshop condition, the 5-minute condition resulted in higher waiting scores than did the other two waiting conditions (30 minutes: t=2.29, df=116, p<.05; 60 minutes: t=6.25, df=116, p<.01), and the 30-minute waiting condition resulted in higher waiting scores than did the 60-minute waiting condition (t=3.96, df=116, p<.01).

Discussion

Regarding the results for the competitive achievement motive, in the 5-minute condition, a significant

difference in the strength of anticipated frustration was observed between the park and bookshop conditions. However, in the park condition, the strength of anticipated frustration already was lower. Therefore, the difference in the strength of anticipated frustration between bookshop and park condition was small. Therefore, the difference in waiting scores between the park and bookshop conditions was not significant.

However, with increased waiting time, anticipated frustration increased and waiting scores decreased in the park and bookshop conditions. Comparing the bookshop with the park condition, the bookshop condition had lower anticipated frustration than park condition. Then, this difference might be large. Thus, bookshop condition had the higher waiting scores than park condition in the 30- and 60-minute conditions, Thus, the interaction effects between waiting place and waiting time was observed for the strength of anticipated frustration and the waiting behavior.

However, the interaction effect between waiting place and waiting time observed for the anticipated frustration and waiting scores was not observed for the value of the waiting object. This result suggests that the cognitive value evaluation model was not valid. Therefore, more research is needed to investigate further the validity of the cognitive value evaluation model.

Regarding the self-fulfilmentive achievement motive, in terms of waiting scores, no significant difference was observed between the park and bookshop conditions; both had higher waiting scores. However, with increased waiting time, waiting scores decreased in both conditions. Comparing the park with the bookshop condition, the 30- and 60-minute bookshop condition had higher waiting scores than park condition. That is, an interaction effect between waiting place and waiting time was observed for waiting behavior.

However, the interaction effect between waiting place and waiting time observed in the waiting scores was not observed for anticipated frustration or the value of the waiting object. This result suggests that the cognitive value evaluation model is not valid. Therefore, more research is needed to investigate further the validity of the cognitive value evaluation model.

Conclusion

Previous studies (Mitsutomi & Kobayashi, 2012, Mitsutomi & Kobayashi, 2014, Mitsutomi, Kobayashi & Fukuhara, 2015) have focused primarily on situational factors. However, to investigate the ways in which personality factors interact with situational factors, it is necessary to examine not only situational factors, such as the level of intimacy with a waiting object, the waiting place, and the waiting time, but also personality factors that influence waiting behavior.

Mitsutomi and Kobayashi (2016) conceptualized aggressiveness as a personality factor and both waiting place and waiting time as situational factors. As a result, they found no interpretable interaction effect on waiting behavior between aggressiveness and both waiting place and waiting time.

In the study by Mitsutomi and Kobayashi (2018), a coronary-prone behavior pattern consisting of hostility, perfectionism, and workaholism was used instead of aggressiveness. Thus, we conceptualized the coronary-prone behavior pattern as a personality factor and both waiting time and waiting place as situational factors. The results indicated interaction effects for waiting behavior and the value of waiting object between waiting time and perfectionism.

In the present study, Study 1 conceptualized cognitive reflectiveness as a personality factor and both waiting time and waiting place as situational factors, whereas Study 2 used achievement motive as a personality factor instead of cognitive reflectiveness.

The results of Study 1 and Study 2 indicated that no main effect was observed for the personality factor and no interaction effect was observed between the personality and interaction factors. No main effects of the

personality factor and no interaction effect between the personality and situational factors may have been observed because we used a hypothetical waiting situation; these issues should be investigated in actual waiting situations.

However, interaction effects were observed for waiting behavior between waiting place and waiting time. In Study 1, the interaction effect observed for waiting behavior was observed for the strength of anticipated frustration and the value of the waiting object. This result suggests that the cognitive value evaluation model is valid. However, regarding the competitive achievement motive in Study 2, the interaction effects observed for waiting behavior and anticipated frustration were not observed for the value of the waiting object. Regarding the self-fulfilmentive achievement motive in Study 2, the interaction effect observed for waiting behavior was not observed for the strength of anticipated frustration or the value of the waiting object. These results suggest that the cognitive value evaluation model is not valid. Therefore, more research is needed to investigate further the validity of the cognitive value evaluation model.

Note In the intimacy H condition, waiting is pleasant. Therefore, subject do not anticipate the stronger feeling of frustration in the intimacy H condition in which waiting is pleasant compared with intimacy L condition. Furthermore, traditionally, the high intimacy condition is associated with a high degree value for the waiting object than is the intimacy L condition. Therefore, subject place a higher value on the waiting object in the intimacy H condition compared with the intimacy L condition. Therefore, intimacy H condition lead to higher waiting scores than does the intimacy L condition.

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