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# Effect of Enlightenment Video for Walk on Motivation and Action

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## ABSTRACT

Because of COVID-19, the chances of walking are decreasing due to the recommendation of telework and stay home. On the other hand, a survey on physical activity and exercise by the Ministry of Health, Labor and Welfare has indicated that increasing physical activity centred on walking can be expected to reduce the incidence of lifestyle-related diseases by several percent. Therefore, it is necessary to examine the method of presenting the stimulus that promotes behaviour change from the current life with little walking and its contents. In the experiment, we investigate the effect of walking enlightenment videos created by focusing on the content and expression of walking habits on changes in the number of steps and awareness of walking. As the results of experiment, it is possible that explaining the positive effect of walking may contribute to the increase in the number of steps, rather than explaining the negative effect of not walking. Furthermore, enlightenment videos will increase the number of steps for people with a high approach temperament rather than those with a low approach temperament.

**Keywords:** Behaviour change, Enlightenment video and approach-avoidance temperament

## INTRODUCTION

Due to the impact of the COVID-19 virus resulting in recommendations to work from and stay home, people have fewer opportunities to walk. However, a study on physical activity and exercise conducted by Japan's Ministry of Health, Labour and Welfare indicates that the risk of lifestyle diseases may be decreased by several percentage points through an increase in physical activity, walking in particular (Repor, 2021). As such, it is necessary to consider the content and presentation method of material that encourages behaviour modification away from a lifestyle with little walking. In regards to behaviour modification, Matsumoto's model for behaviour change stages indicates that people go through five stages: precontemplation, contemplation, preparation, action, and maintenance (Matsumoto, 2021). To encourage change in the contemplation stage, Matsumoto suggests the importance of people thinking negatively of themselves due to their lack of physical activity and thinking positively of themselves if engaging in physical activity. Furthermore, Saito reports that in advertisements that aim to create desire to purchase and interest, presenting advertisements in the medium of video contributes to behavioural change (Saito, 2013).

Under this context, this study will evaluate the effects that enlightenment videos about walking, created with a focus on content and wording, have on number of steps and awareness toward walking. In addition, we will focus on people’s temperaments and consider what enlightenment videos are effective for such temperaments.

**EVALUATION EXPERIMENT**

**Experiment Objective and Method**

In this experiment, experimental participants watch an enlightenment video about walking, and changes in awareness toward walking are evaluated by comparing their number of steps and answer results from questionnaires conducted one week prior and one week after viewing the video. Two types of videos have been created in advance: a “positive video” that explains only the positive effects of walking (such as that it is good for your health and mood), and a “negative video” that explains only the negative effects of not walking (such as that it is bad for your health and mood). Figure 1 shows a portion of the content from the positive video and the negative video. Also note that the positive video is accompanied by upbeat background music while the negative video is accompanied by gloomy background music.

Figure 2 shows the experimental procedure. First, experimental participants are given a detailed explanation of the experiment and then give permission to have their number of steps measured and to answer questionnaires. One week after the experiment instructions are given, participants



Figure 1: Contents of “positive video” (left) and “negative video” (right).

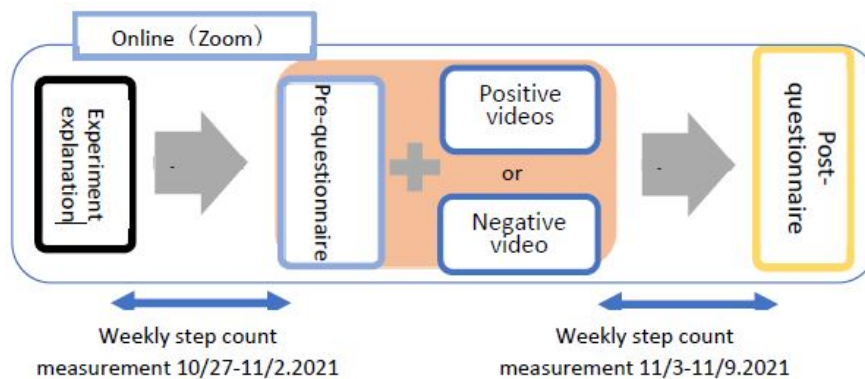


Figure 2: Experimental procedure.

report their number of steps for the week and answer a pre-questionnaire. Next, the experimental participants are divided into two groups at random, with one group shown the positive video and the other group shown the negative video. One week after viewing the video, participants report their number of steps for the week and answer a post-questionnaire. The experimental participants are 43 students from Doshisha University. Note that due to data deficiencies, analyses were conducted with 29 of the participants' results. Also note that Zoom was used to show the videos and that Google Forms was used for the questionnaires.

### Questionnaires

Table 1 shows questions from the survey regarding awareness toward walking, and Table 2 shows the approach-avoidance temperament questionnaire. In the pre-questionnaire, participants answer questions regarding their awareness toward walking, their approach-avoidance temperament, and their

**Table 1.** Questionnaire for walking.

Q1	I like to walk.
Q2	Walking is good for health.
Q3	Walking is good exercise.
Q4	Walking can decrease transportation expenses.
Q5	Walking is good for the environment.
Q6	Walking is refreshing.
Q7	Walking is tiring.
Q8	Walking takes extra time.
Q9	I don't want to walk when the weather is bad.
Q10	Walking limits me to only nearby locations.
Q11	Walking is an inconvenient form of transportation.
Q12	I walk more than most people.
Q13	I have fewer opportunities to walk due to the COVID-19 pandemic.
Q14	I want more opportunities to walk.
Q15	I want to walk with proper form.

**Table 2.** Approach-avoidance temperament questionnaire.

Temperament		
Q2	Approach	I feel very energized when I think about my dreams.
Q4		I immediately get excited when I get an opportunity to do something that I like.
Q5		I get excited and feel motivated at even small things.
Q8		I am always on the lookout for positive opportunities and experiences.
Q10		I am strongly influenced when something good happens to me.
Q11		When I desire something, I feel a strong urge to fulfil that desire.
Q1	Avoidance	I am a very sensitive person by nature.
Q3		I get anxious at even small things.
Q6		I feel anxiety and fear very intensely.
Q7		I respond very strongly when something bad happens.
Q9		I feel a strong urge to run away when something bad is about to happen.
Q12		I am quick to imagine what bad things may happen to me.

number of steps for the week. In the post-questionnaire, the participants again answer questions regarding their awareness toward walking and their number of steps for that week.

The questions from the survey regarding awareness toward walking, as shown in Table 1, have been created based on the questionnaire used by Ichihashi et al. (Ichihashi 2010). All questions are answered on a scale of one through seven.

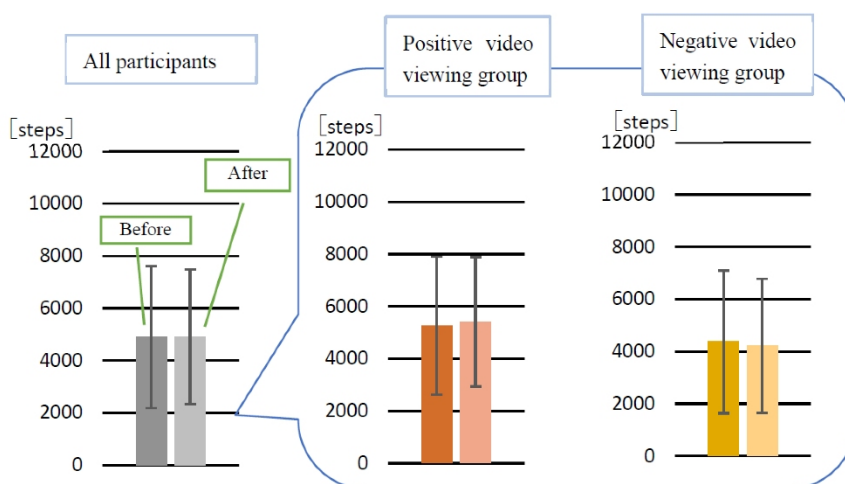
The approach-avoidance temperament questionnaire, as shown in Table 2, is a questionnaire that measures the degree to which an individual shows intention to approach positive stimuli and the degree to which they show intention to avoid negative stimuli (Elliot, 2002), (Kakinuma, 2018). All questions are answered on a scale of one through seven, with higher total scores on the six questions regarding approach temperament indicating a stronger approach temperament, and with higher total scores on the six questions regarding avoidance temperament indicating a greater avoidance temperament.

In this experiment, t-tests were used to perform all statistical analyses for number of steps, and Wilcoxon signed-rank tests were used to perform all statistical analyses for the questionnaires.

### Results for All Experimental Participants, the Positive Video Group and the Negative Video Group

Figure 3 shows the weeks' average number of steps for (left) all experimental participants, (centre) the group that viewed the positive video and (right) the group that viewed the negative video.

The positive video group showed an increase in average number of steps, but no statistically significant difference was observed. However, the negative video group showed a decrease in average steps after viewing the video compared to before, and a statistically significant difference was observed.



**Figure 3:** Average and standard deviation of number of steps per week for all participants(left), for positive video viewing group (centre) and for negative video viewing group (right).

Figure 4 shows the results of the awareness surveys on walking for all experiment participants. Answer results from Question 2 (“Walking is good for health.”), Question 9 (“I don’t want to walk when the weather is bad.”) and Question 13 (“I have fewer opportunities to walk due to the COVID-19 pandemic.”) showed decreased ratings after viewing the video compared to before, and statistically significant differences were observed. Ratings for Questions 2 through 6 were expected to increase while ratings for Questions 7 through 11 and 13 were expected to decrease, meaning that generally favourable results were achieved when looking at the entire experimental participant group, with the exception of Question 2.

Figure 5 shows the results of the awareness surveys on walking for (a) the group that viewed the positive video and (b) the group that viewed the negative video. In the group that viewed the positive video (a), answer results for Question 2 (“Walking is good for health.”), Question 9 (“I don’t want to walk when the weather is bad.”), Question 9 (“I don’t want to walk when the weather is bad.”), Question 9 (“I don’t want to walk when the weather is bad.”)

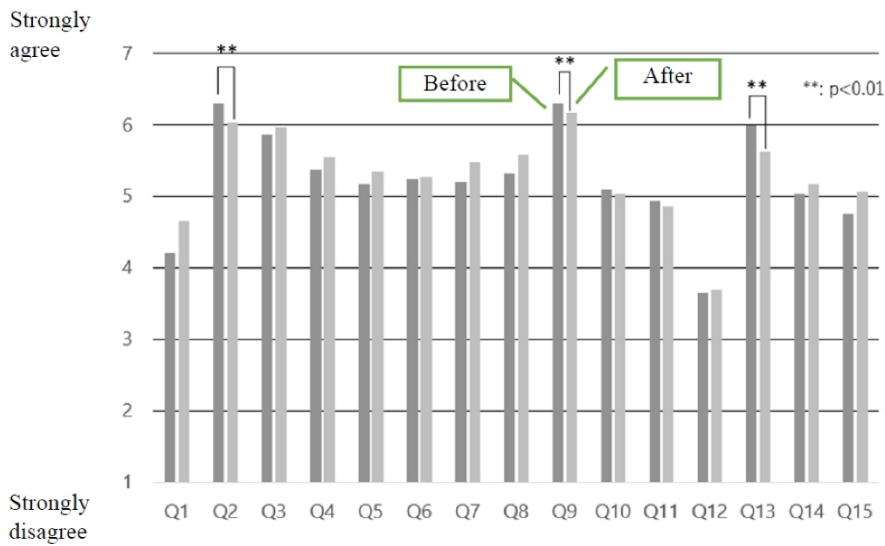


Figure 4: Results of awareness survey on walking of all participants.

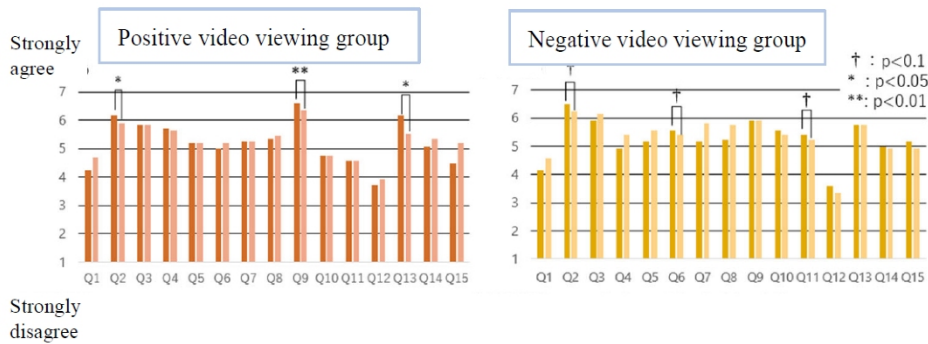


Figure 5: Results of an awareness survey on walking in the (left) positive video viewing group and (right) negative video viewing group.

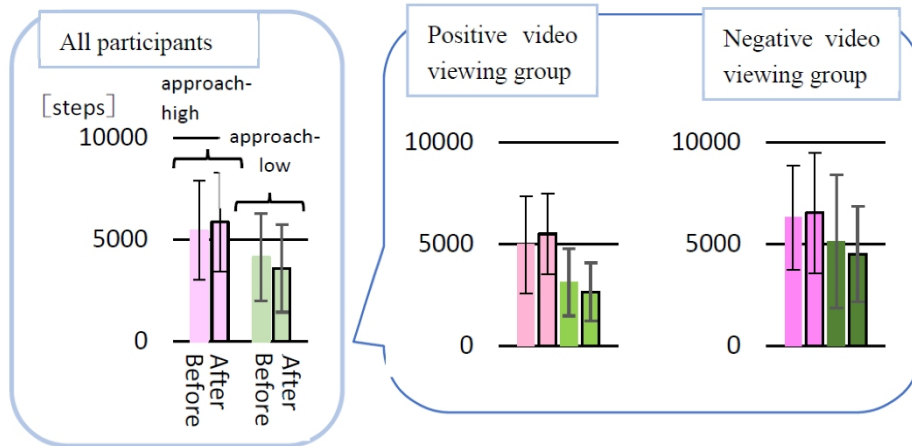
walk when the weather is bad.”), and Question 13 (“I have fewer opportunities to walk due to the COVID-19 pandemic.”) showed decreased ratings after viewing the video compared to before, and statistically significant differences were observed. Similarly, in the group that viewed the negative video (b), answer results for Question 2 (“Walking is good for health.”), Question 6 (“Walking is refreshing.”), Question 11 (“Walking is an inconvenient form of transportation.”) showed decreased ratings after viewing the video compared to before, and statistically significant differences were observed. These results indicate that watching the positive video may be slightly more effective.

### **Results Categorized Based on Approach-Avoidance Temperament Questionnaire Answers**

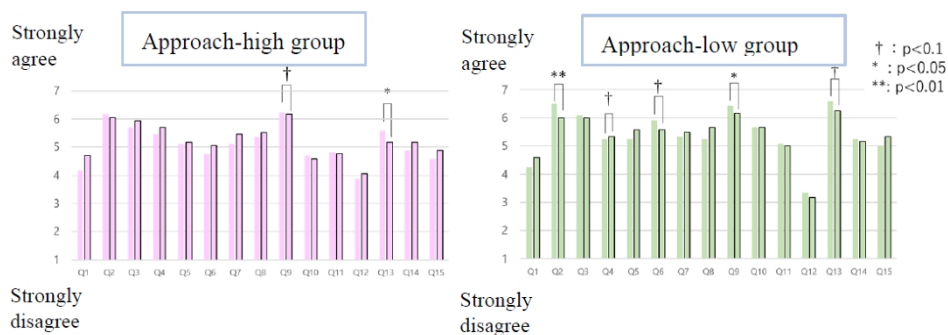
Based on the approach-avoidance temperament questionnaire results. Using the average score 29.65 from the two surveys reported in Kakinuma et al.’s research (Kakinuma, 2018), those who scored higher than 29.65 on the approach portion were categorized in the high approach group, while those who scored lower than 29.65 were categorized in the low approach group. Similarly, using 27.72 as the average score, those who scored higher than 27.72 on the avoidance portion were categorized in the high avoidance group, while those who scored lower than 27.72 were categorized in the low avoidance group. Moreover, those with both higher approach scores and higher avoidance scores were categorized into a high approach-high avoidance group (5 people); those with higher approach scores and lower avoidance scores were categorized into a high approach-low avoidance group (12 people); those with lower approach scores and higher avoidance scores were categorized into a low approach-high avoidance group (5 people); and those with lower approach scores and lower avoidance scores were categorized into a low approach-low avoidance group (7 people).

Figure 6 shows the average weekly number of steps categorized by approach scores for (left) all experimental participants, (centre) the group that viewed the positive video, and (right) the group that viewed the negative video. No group showed a statistically significant difference in the number of weekly steps before viewing the video compared to after, but regardless of the type of video watched, the high approach group’s average number of steps increased while the low approach group’s average number of steps decreased.

Figure 7 shows the results of the awareness survey on walking categorized by approach scores for all experimental participants. Regarding the high approach group (a), answer results for Question 9 (“I don’t want to walk when the weather is bad.”) and Question 13 (“I have fewer opportunities to walk due to the COVID-19 pandemic.”) showed decreased ratings after viewing the video compared to before, and statistically significant differences were observed. Regarding the low approach group (b), answer results for Question 2 (“Walking is good for health.”), Question 6 (“Walking is refreshing.”), and Question 9 (“I don’t want to walk when the weather is bad.”) showed decreased ratings after viewing the video compared to before, and statistically significant differences were observed. Answer results for



**Figure 6:** Average number of steps per week compared with high and low approach temperament (left) all participants, (centre) positive video viewing group and (right) negative video viewing group.

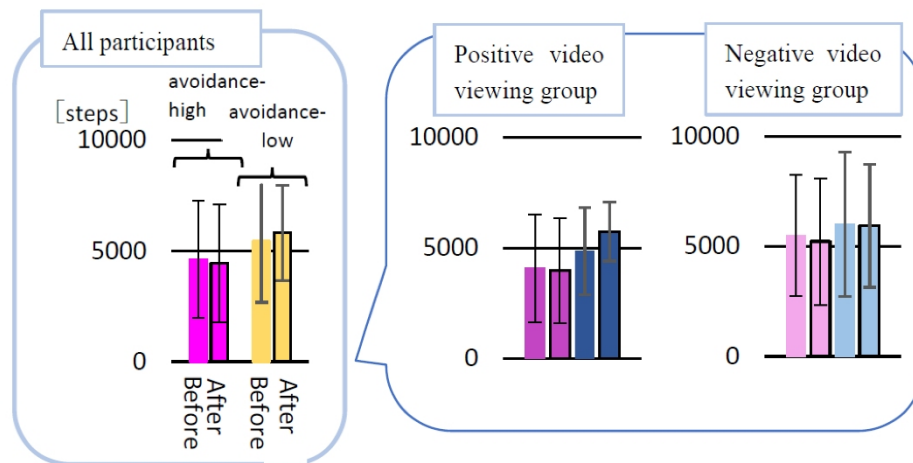


**Figure 7:** Result of awareness survey on walking categorized by (left) high and (right) low approach temperament.

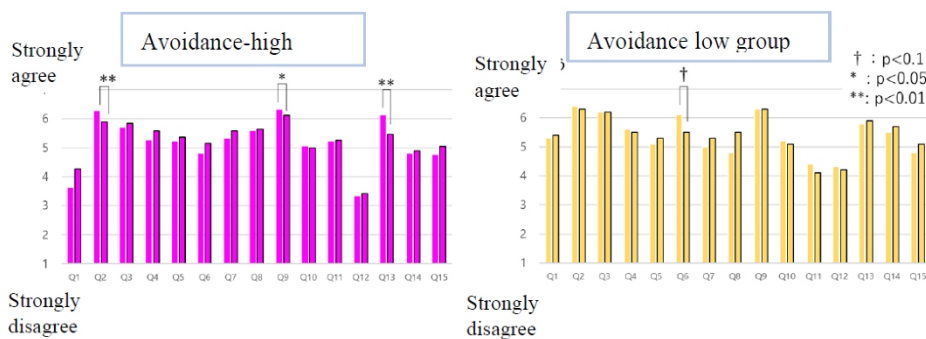
Question 4 (“Walking can decrease transportation expenses.”) showed increased ratings after viewing the video compared to before, and a statistically significant difference was observed. These results suggest that the high approach group displayed a positive effect from viewing the video compared to the low approach group.

Figure 8 shows the average weekly number of steps categorized by avoidance scores for (left) all participants, (centre) the group that viewed the positive video, and (right) and the group that viewed the negative video. No group showed a statistically significant difference in the number of weekly steps before viewing the video compared to after, but the high avoidance group in all participants category showed a decrease in average number of steps, and the low avoidance group showed an increase in average number of steps.

Figure 9 shows the results for the awareness survey on walking categorized by avoidance scores for all experimental participants. Regarding the high avoidance group (left), answer results for Question 2 (“Walking is good



**Figure 8:** Average number of steps per week compared with high and low avoidance temperament (left) all participants, (centre) positive video viewing group and (right) negative video viewing group.



**Figure 9:** Result of awareness survey on walking categorized by (left) high and (right) low avoidance temperament.

for health.”), Question 9 (“I don’t want to walk when the weather is bad.”), and Question 13 (“I have fewer opportunities to walk due to the COVID-19 pandemic.”) showed decreased ratings after viewing the video compared to before, and a statistically significant difference was observed. Regarding the low avoidance group (right), answer results for Question 6 (“Walking is refreshing.”) showed decreased ratings after viewing the video compared to before, and a statistically significant difference was observed.

## DISCUSSIONS

This study evaluated the effects that enlightenment videos about walking, created with a focus on content and wording, have on number of steps and awareness toward walking. Figure 10 shows the pre-experiment hypothesis, and Figure 11 shows the overall experimental results for weekly average number of steps. Before the experiment, we expected that participants with



		Positive video viewing group (17people)	Negative video viewing group (12people)	All
Approach	High			
	Low			
Avoidance	High			
	Low			
All				

**Figure 10:** Pre-experiment hypothesis of average number of steps per week made in advance.

		Positive video viewing group (17people)	Negative video viewing group (12people)	All
Approach	High	 (11people)	 (6people)	 (17people)
	Low	 (6people)	 (6people)	 (12people)
Avoidance	High	 (5people)	 (5people)	 (10people)
	Low	 (12people)	 (7people)	 (19people)
All		 (17people)	 (12people)	 (29people)

**Figure 11:** Summary of experimental results of average number of steps per week.

stronger approach temperaments would greatly increase their number of steps by viewing the positive video, and those with stronger avoidance temperaments would greatly increase their steps by viewing the negative video. The experiment results show that number of steps increased for the group with strong approach temperaments who viewed the positive video, but the number of steps decreased for those with strong avoidance temperaments who viewed the negative video. In other words, people with stronger approach temperaments may be more likely to increase their number of steps by viewing enlightenment videos compared to those with weaker approach temperaments. Also, this may demonstrate that explanations of the positive effects of

walking are more effective in contributing to an increase in number of steps than explanations of the negative effects of not walking.

## CONCLUSION

This study evaluated the effects that enlightenment negative and positive videos about walking, created with a focus on content and wording, have on number of steps and awareness toward walking. Results showed that informing people about the positive aspects of walking may contribute to an increase in the number of steps compared to explanations about the negative aspects of not walking. In addition, those with stronger approach temperaments may be more likely to increase their number of steps after viewing the enlightenment videos compared to those with weaker approach temperaments.

## ACKNOWLEDGMENT

This work was supported by JSPS KAKENHI Grant Number 21K11988.

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