

An Experimental Analysis of Folklore and Culture

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Abstract.

Bruner (1990) mentioned that those who shared the same meaning of a word were members of the same culture. He also said that small children learnt the meaning of a word from their parents first. Naturally, children firstly became members of the culture their parents belonged to. Based on his claim, we experimentally tested the effect of culture on people's actions. We collected survey data of Grade 4-12 students who read one of two versions of folklore, "The Ant and the Grasshopper" which had two extreme endings. We analyzed the data by using multiple regressions and 2-way ANOVA to examine the effect of different endings on subjects' actions about helping others. While the variable representing different endings was not significant, the variable which reflected the culture of which a subject was a member was significant. This implies the culture influenced a subject's action and it was in line with Bruner. Elementary school teachers can use our outcomes as effective learning methods for young students to teach morals and ethics.

Keywords: Culture, meaning, narrative, experiments, empirical analysis

1. Introduction

(Bruner, 1990) said that culture must be a central concept for psychology on p 23. He also told us that meaning was rendered public and shared by virtue of participation in culture on p. 23. He studied on p 82 and p 83 a child named Emily's development of narrative from 22 months old to 33 months old and showed the process of her narrative development by her family members' talking to her and their conversation. This meant that narrative development in a child was mostly determined by his/her family members. Since usually, the family shared common values, a small child absorbed and shared the family's common values naturally. Bruner also mentioned that the common values shared by the public were a culture. Since we are social animals, it is important to predict correctly what our counterparts interpret our words when we talk to others and we call those who share the same meaning of the same word as in the same culture. For example, (Goicochea, 2018) mentioned that the "first floor" is the building floor at ground level in America while it is the floor above the ground level in England. (Sencion, 2018) said that "gift" means a present in the U.S. while it means poison in Germany. So, the U.S, England, and Germany are not in the same culture.

(Baba, 2021) is the research our paper is based on. It analyses the effect of folklore on study hours and quiz scores and concludes that folklore influences what subjects say, but not what they do. Namely, saying and doing were different. More precisely, subjects' decisions about study hours in the near future are influenced by the folklore they read, but their actual quiz scores are not influenced by folklore. On p. 41, Bruner says that we can call "folk psychology" "common sense." We heard about the research topic privately and were interested that choosing the younger subjects might change the results because younger subjects such as preschool children did not have so many social experiences and they were more flexible to adopt new

ideas. Professor Dan Ariely supported my idea. We planned to use a similar questionnaire as (Baba, 2021) but needed to change it because our subjects were Grade 4 to Grade 12 and we could not offer the same quiz to all of them due to their learning contents being very different.

(Bruner, 1998) showed that prevalent narratives led us not only to interpret facts in a particular way but also to generate those very facts through the acts we perform in consonance with these narratives.

Although (Bruner, 1990 and 1998) were the motivation for this work, narrative persuasion is the closest literature. (Oatley, 2008) used the survey method and claimed that fiction readers revealed more empathy and personality change than non-fiction readers. (Mar et al., 2006) showed scientifically that social skills of fiction print exposure were higher than non-fiction print exposure and there was no gender difference. (Mar & Oatley, 2008) said in the abstract that fiction literature had largely been ignored by psychology researchers because its only function seemed to be entertainment, with no connection to empirical validity. We have difficulty understanding this. In our experience, folklore is fiction, it is the first book most of us encounter because it is the one our parents read for us when we are infants, then, folklore is the first book we read by ourselves. Usually, every folklore has a lesson to teach, and we learn it. For example, the original ending of *The Ant and the Grasshopper* teaches us we need to be farsighted and work hard every day to prepare for the future. We repeatedly read folklore, absorb the lesson it teaches, and the lesson turns out to be our principle. Most folklore is fiction and obviously, it constructs important parts of our disciplines. At least that is the motivation for this work. Namely, examining the effect of folklore on our behaviours. In other words, analyzing the effect of our common sense which has been constructed by absorbing the lesson folklore taught us on our behaviours. Therefore, it is very difficult to understand how psychology researchers have left fiction literature unexplored till recently. Of course, (Mars and Oatley, 2008) concluded that narrative text was more likely to prompt vivid autobiographical memories in which the reader was an actor or active observer of scenes rather than more abstract conceptual memories. In the series of his work, Oatley emphasized that fiction worked as a mental simulation of social experience by empathy and by active involvement by a reader. Exposure to fiction could take the shape of not only reading fiction literature but watching TV programs, movies, videos, and playing video games. (Oberman, Pineda, & Ramachandran, 2007) supported (Mars & Oatley, 2008). They made subjects watch 4 videos with different levels of interactions among people in the video and between people in the video and a viewer. They showed mirror neuron was fired most when a viewer watched a video where both interactions among people in the video and interaction between people in the video and a viewer happened, a video with interactions among people in the video came second, a video with people without interaction followed, and a video with white noise was the last. It showed measuring mirror neuron activity was the effective method for humans to examine the effect of not only a movement but also a social interaction. Mirror neuron was introduced to the literature by (di Pellegrino et al., 1992). They found that premotor neurons were activated both when macaque monkeys observed a goal-directed hand movement such as grasping food by a human and when the same monkeys acted by themselves to do the same movement. It implied that a monkey could find the meaning of the observed action and the neurons were named mirror neurons due to this coincidence between an observed action and corresponding self-action. Although measuring mirror neurons got attention from researchers gradually, (Taylor, 2016) said that attributing the construction of meaning to mirror neurons only was dubious because an autistic patient whose mirror neurons were not active could construct meaning from observing another person's action which the patient could not copy. We can apply the mirror

neuron mechanism to our experiment. When we read folklore, we often translate characters in the story to people in the real world. For example, when I read “the Ant and the Grasshopper,” I transfer the Grasshopper to me and the Ant to my close friend because of our everyday behaviours. I predict that I am likely to be in trouble in the future while my close friend will be fine. The Ant and the Grasshopper tells me that I should work hard every day to avoid problems I may encounter in the future. The mirror neuron mechanism is applicable to our setting due to our transferring procedures of the characters in a story to those in the real world.

2. Survey Procedure

The questionnaire is available upon request to the author. There are versions A and B for Aesop's The Ant and the Grasshopper. Version A and version B are different only in the endings, as seen in part 5 of the questionnaire. In version A, the ant did not give its food to the grasshopper while the ant gave food to the grasshopper in Version B. The questionnaire of version B is the same as that of version A except the story part in Part 5.

Our goal of this survey is an analysis of the story's effect on grade school students and a comparison of our results with those in (Baba, 2021) which used university students as subjects. We think that the story's effect on younger students might be different from that on university students. We were especially interested in preschool children and kids who just started school (Grade 1-2), but we decided not to do so because it was really difficult to obtain each parents' permission which was required to send the questionnaire and also that it might be very difficult for them to read and to answer the questions. All the students belonged to the same school, and we appreciate the school's cooperation very much. The questionnaire was sent by Google form and was answered by Grade 4 to Grade 12 students in the week of October 21. 140 students responded in total. Each subject read only one of 2 versions.

There are 20 questions in the survey. We asked several questions both before and after the main part of reading the story to examine the impact of the story's influence. There were some limitations by the school rule. Firstly, the school prohibited us to include any questions about gender even if we included the option of “prefer no response.” We were also prohibited from asking the grade or the age of each subject, but we were allowed to ask whether s/he was a high school student (SS), junior high school student (US), or elementary school student (C). Although we wanted anonymous responses by writing answers on the hard copy of the questionnaire, we ended up using Google form and required a responder to write his/her email address which is Question 1. In Question 2, we asked how important religion was in his/her everyday life. We believed that believing religion might influence the effect on how many times a student helps others since Christianity tells one should help others, for example. Here also, we wanted to ask the exact name of religion a subject believed, but it was not allowed, and Question 3 asked the importance of religion in life in 4 levels. Questions 4, 5, 6, 7 before reading the story corresponded to Questions 17, 18, 19, and 20 after reading the story. Question 4 asked the number of days a subject was late to school so far, Question 5 asked the reason why a subject was late to school if s/he chose a strictly positive number. This question measured how hard a subject worked in general. We decided to equate the frequency of a subject that was late to school with how lazy s/he was. Since the reasons for being late for school were written immediately after Question 5, we deducted the uncontrolled reason such as train accidents, his/her health conditions, and so on from his/her answer to obtain effective numbers. Question 6 asked the total number of times a subject offered his/her help to others in the previous week, and Question 7 asked their personality which measured a subject's altruism. We thought

altruism was important because the more altruistic a subject was, the more help a subject offered.

We included Question 8 which measured a subject's risk attitude using the popular method introduced by (Holt & Laury, 2002). Option A had no risk, but the payment was low while option B had risk, but the payment was high or 0 depending on the lottery outcome. There were 15 sub-questions in Question 8 and the probability of getting high payment in option B monotonically increased from 0. So, a rational subject chose option A first, but switched to option B at some sub-question and continued to choose option B once s/he switched to option B. The larger the number of the sub-question s/he switched from option A to option B, s/he was more risk-averse. We recorded the number of the sub-question where a subject switched from option A to option B. We recorded 16 when a subject chose option A all the time. Question 9 and 10 measured a subject's future discount rate. A rational subject chose the same options between Question 9 and 10 because 2 questions were different only in the time spans. Question 9 was between now and 6 months later while question 10 was 1 month later and 7 months later. So, both questions asked a subject to compare some date and 6 months later. The only difference was the starting date. Question 9 asked a subject to choose between now and 6 months later payments. There were 20 sub-questions, and two options, A and B were offered for each sub-question. Option B always offered 10,000-yen payment after 6 months from now for all the sub-questions while option A offered a certain amount of payment now. The amount of payment in option A decreased from 10,000 yen in sub-question 1 to 500 in sub-question 20 monotonically at the rate of -500 yen per sub-question. A rational player should choose option A in sub-question 1 because both options A and B pay 10,000 yen in sub-question 1. Then, a rational subject should switch from option A to option B at some sub-question and continue to choose option B once s/he switched to option B. The larger the number of the sub-question s/he switches from option A to option B, s/he thought now was more important than 6 months later and his/her future discount rate was higher. Since all the subjects lived in Japan when we offered our questionnaire, they would live in Japan 7 months later since they would still be students in the same school and the school's end of the academic year would be late in June. Usually, the future discount rate depended on the market interest rate theoretically, and (TRADING ECONOMICS, n.d.) told us that the short-term interest rate was -0.1% in the week of October 21, 2021. Note that the short-term interest rate was normally a strictly positive number. Applying -0.1% market interest rate to our Question 9 implied that 10,000 yen in the 6 months later was equal to 10,010 yen now. Since we did not want to give any indication by setting the number, we used a 500-yen grid and made 100,10 yen as 100,00 yen. Note that any minor could open his/her own bank accounts in Japan. Since the most recent survey of minors' financial situation by (The Central Council for Financial Services Information, 2016) reported that 41.5% of Grade 4-6 students, 39.9% of Grade 7-9 students, and 52.8% of Grade 10-12 students knew that they had their own bank accounts. Among those who knew that they had their own bank accounts, 34.9% of Grade 7-9 students and 62.2% of Grade 10-12 students had used an ATM at least once in the past. They did not report the percentage of Grade 4-6 students who had used an ATM at least once in the past. Therefore, only 13.9% ($=0.3990 \cdot 34.9$) of Grade 7-9 students and 32.8% ($=0.528 \cdot 62.2$) of Grade 10-12 students among all students had used an ATM at least once in the past. This was quite a low percentage, and it was possible that a subject used his/her subjective discount rate in our case because the short-term market interest rate was not such a familiar concept to them. Furthermore, it was also possible that a subject followed hyperbolic future discount rate as behavioural economics claimed against traditional theorists assuming constant future discount rate which was equal to the short-term market interest rate. (Baba, 2021) reported that most subjects chose the same option between

Question 9 and 10 and multicollinearity occurred, which was not the case for us. It meant that our subjects might not follow the rational choice theory. Then, the main part came. In part 5, a subject read a randomly chosen version (version A or version B) and answered questions 11 to 16. No subjects read both versions. Question 11 asked the lesson a subject learnt from the story. Question 12 asked a subject to evaluate the ant's behaviour toward the grasshopper in the story subjectively from 0 (very cruel) to 10 (very friendly). We made the options to be odd numbers to make sure a subject could find the neutral number (5 in our case) easily. Question 13 was similar to Question 12 but asked the "appropriate" behaviour of the ant. So, Question 12 vs. Question 13 compares "what it is" and "what it should be." Then, based on Question 13, Question 14 asked a subject to write the "appropriate" behaviour of the ant in one or two sentences. Since a subject knew both versions or not might influence the outcome, Question 15 asked whether a subject knew other conclusions because it could influence the impact the story gave to the subject. 4 out of 71 subjects who read version A and 4 out of 69 subjects who read version B answered "Yes" to this question and they reported they knew some close ending to the other version in Question 16. Question 17, 18 and 19 corresponded to Questions 4, 5, and 6. The only difference was time. Question 17, 18, and 19 were about the next week while Questions 4, 5, 6, and 7 were about the last week. Question 20 was exactly the same as Question 7. We asked a subject's personality before (Question 7) and after (Question 20) reading the story to see the story's effect on his/her personality. Approximately, a quarter of subjects chose different alternatives between Question 7 and Question 20. The big difference from the questionnaire in (Baba, 2021) was that we could not use any exam scores before and after reading a version of the story because it was very difficult to make the same quiz applicable to Grade 4 to Grade 12 students. This was the point Professor Dan Ariely agreed with us in our private talk. He suggested including a question to ask a subject how to spend the summer break before and after reading the story. Since we planned to send out our questionnaire just before the summer break, we almost tried to do so, but we thought a young student's opinion could not change how they spend summer just before the summer break because most families had big family plans such as family travels during summer break. So, we changed the question to ask the numbers of help a subject offered in school and at home such as helping other kids, helping teachers at school, helping one's family members at home, doing some household chores, and running errands in the last week before reading the story. After reading the story, we also ask the numbers of help a subject will offer in school and at home such as helping other kids, helping teachers at school, helping one's family members at home, doing some household chores, and running errands in the next week. For simplicity, we call these two variables HelpBefore and HelpAfter from now on. Very recently, we found that our choice of using "the number of help others" might not be appropriate to study the effect of the story. This was because it was those who were helped who received benefit when a subject increased "the number of help others," but not a subject her/himself. It might be appropriate to choose the variable whose whole benefit a subject could enjoy such as his/her study hours before and after reading the story. Since both questions about the number of help a subject offered (resp. will offer) could not be verified, they were categorized as "what they say" in (Bruner, 1990). Unfortunately, we could not make an appropriate question asking "what they do" in our survey. Therefore, we can only examine the effect of the story reading on "what they say."

3. Regressions and Hypothesis tests

We obtained the following numbers of data.

Table 1: Data set.

Version	Class	C	US	SS
Version A		29	22	20
Version B		9	20	40

Source : Survey data by the author

Unfortunately, Table 1 shows that the data structure was very biased except for the US. We expected to have equal numbers of responses for each of version A and version B; however, Table 1 showed that the ratio of the responses of version A to B was 29/9 for C class, 22/20 for US class, and 20/40 for SS class. We also might suffer from small sample problems since all our sample sizes except version B of SS class were below 30.

We had two objectives to analyze the data. Firstly, we would like to know which variables are significant to explain the change of the ratio of the help before reading the story and after reading the story. Secondly, we conducted 4 hypothesis tests to examine whether classes or the versions were the key factors to the change of the numbers of help. Denote the ratio of the change of the numbers of help before and after reading the story as HelpRatio which is defined as

$$\text{HelpRatio} = ((\text{HelpAfter}) - (\text{Help Before})) / (\text{Help Before}).$$

We use HelpRatio as the independent variable of multiple regressions in 3.1 and 3.2.

Multiple regression analysis was used because the dependent variable was continuous. Chapter 12 in (Agresti and Finlay, 1997) told us that multiple regression could be applied even if the independent variables were ranked ordinary as long as the dependent variable was continuous.

This is the reason we did not simply choose $(\text{HelpAfter}) - (\text{Help Before})$ as the dependent variable but used HelpRatio instead. The other reason to choose HelpRatio as our dependent variable was explained by a simple numerical example. Suppose that subject1's HelpBefore was 0 and HelpAfter was 2 while subject2's HelpBefore was 48 and HelpAfter was 50. $(\text{HelpAfter}) - (\text{Help Before}) = 2$ for both subjects; however, we thought the same 2 could be interpreted very differently between subject 1 and subject 2. Therefore, we decided to use HelpRatio as our independent variable. Note that $\text{HelpRatio of subject 2} = (2-0)/0 = +\infty$. We solved this problem by adding 1 to all the subjects' answers both before and after reading the story. This is a standard procedure in an empirical study. Furthermore, linear regression was used because it was the default method when one could not specify any particular nonlinear relationship between the dependent and the independent variables. Our case fitted in this category.

3.1 A comparison of the effect of version A and version B

Our main purpose in this section is the following hypothesis test.

H0: Reading version A and reading version B cause an equal effect on the ratio of the change of the numbers of offering help to others.

H1: Reading version A and reading version B cause the different effects on the ratio of the change of the numbers of offering help to others.

Furthermore, we would like to examine which variable(s) was (were) significant in OLS where the dependent variable was HelpRatio and the independent variables were Class(Question2), Religion(Question3), AltruismExante(Question7), AltruismExpost(Question20), Risk (Question8), FD1(Question9), FD2(Question10), Subjective(Question12), Appropriate(Question13), AnotherEnd(Question15), LateSoFar(Question4), LateFuture(Question17), and DummyA0B1. DummyA0B1 took 0 for those who read version A and 1 for those who read version B, which meant that version A was the base, and DummyA0B1 measured how those who read version B were different from those who read version B in HelpRatio.

Table 2: OLS outcome of all 3 classes

	(1)
VARIABLES	OLS VerAB
2.Class	1.732
3.Class	4.868
Religion	-0.350
AltruismExante	0.346
AltruismExpost	-1.622
Risk	-0.158
FD1	-0.0580
FD2	0.171
Subjective	0.105
Appropriate	-1.119**
AnotherEnd	-1.140
LateSoFar	-0.640
LateFuture	-1.226
1.DummyA0B1	-3.261
Constant	13.83**
Observations	140
R-squared	0.091

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
 Source : by the author

Table 2 told us that Appropriate was the only significant variable. The dummyA0B1 was not significant. After obtaining the outcome, we realized that Appropriate was the variable representing a culture a subject belongs to rather than the dummyA0B1. It was because reading a version of a story was just what a subject encountered at that moment while Appropriate represented what s/he thought the ending should be from his/her experiences so far. Therefore, Appropriate reflected long-term principles s/he had constructed in her/himself and mirrored the culture which a subject was a member of. To check multicollinearity, we ran the VIF test. Table 4 was the outcome.

Table 3: VIF of OLS outcomes for all 3 classes

Variables	(1)All
Religion	1.12
AltruismExante	3.01
AltruismExpost	3.09
Risk	1.12
FD1	2.10
FD2	2.10
Subjective	1.62
Appropriate	1.25
AnotherEnd	1.10
LateSoFar	1.34
LateFuture	1.31
1.DummyA0B1	1.58
Mean VIF	1.73

Source : by the author

(Bandahri, 2020) showed that any variable whose $VIF > 5$ should be concerned. Table 3 shows that there was no significant multicollinearity problem in our model because all the VIF values were below 5. Multicollinearity meant that there was a significant correlation among dependent variables and the estimated coefficient by multiple regression.

3.2 Comparisons of 3 classes

Based on 3.1, we now want to investigate whether 3 classes acted in the same way, or not. For this purpose, we applied the same method we used in 2-1 to each of 3 classes. Table 3 shows the outcome. Table 3 includes Table 1 to compare the OLS outcome of all 3 classes and each class straightforwardly. In Table 3, (1) is copied from Table 1, (2) is the outcome for class SS, (3) is the outcome for class US, and (4) is the outcome for class C.

Table 3 tells us that the outcomes for SS class and US class share the same property as that of Table 2, that is, Appropriate is the only significant variable although it is barely significant in class SS at 0.1 level. The coefficient of Appropriate is -2.057 for class SS and -0.924 for the class US. It can be misunderstood to imply that those who think the ant should be more friendly planned to offer less help to others in the next week; however, recall that our independent variable was the ratio of the change of help before and after reading the story = (the number of help before reading the story - the number of help after reading the story) / (the number of help before reading the story). Since the number of help before reading the story is in both numerator and denominator of the formula, the ratio could be small when the number of help before reading the story was quite large. We need to note that Religion is significant at 0.1 in class US and its coefficient is strictly positive, 1.722. Therefore, those who think religion is very important help others more. DummyA0B1 is not significant for any of the 3 classes, SS, US, and C. As we noted in 3.1, Appropriate is the variable that reflects culture, and this outcome

is in line with our hypothesis in the sense that culture effects on the ratio of the change of helps before and after reading the story.

Table 4 : The OLS outcomes of each of 3 classes

4	(1)	(2)	(3)	(4)
VARIABLES	OLS VerAB	OLS VerABgivenSS	OLS VerABgivenUS	OLS VerABgivenC
2.Class	1.732			
3.Class	4.868			
Religion	-0.350	-3.395	1.722*	-0.253
AltruismExante	0.346	1.190	-2.330	-0.0936
AltruismExpost	-1.622	-0.0367	0.0918	-0.155
Risk	-0.158	-0.373	0.252	0.0407
FD1	-0.0580	-0.665	-0.399	0.00608
FD2	0.171	0.894	0.215	0.00177
Subjective	0.105	0.945	-0.318	0.116
Appropriate	-1.119**	-2.057*	-0.924**	-0.0259
AnotherEnd	-1.140	4.646	-3.108	2.022
LateSoFar	-0.640	-0.877	1.275	0.0540
LateFuture	-1.226	-2.322	-3.034	-0.367
DummyA0B1	-3.261	-11.92	-2.388	-0.932
Constant	13.83**	28.37*	11.75*	1.171
Observations	140	60	42	38
R-squared	0.091	0.165	0.352	0.351

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source : by the author

Like 3.1, we need to check multicollinearity by using VIF. Table 5 below shows that there are no multicollinearity problems in our model because all the VIFs are smaller than 5.

Table 5 : VIF for Table 4

VARIABLES				
	(1) All	(2) SS	(3) US	(4) C
Religion	1.12	1.36	1.79	1.35
AltruismExante	3.01	2.31	10.28	3.06
AltruismExpost	3.09	2.49	9.63	3.61
Risk	1.12	1.19	1.61	1.40
FD1	2.10	4.99	3.31	1.47
FD2	2.10	5.26	2.59	1.40
Subjective	1.62	2.60	2.45	1.81
Appropriate	1.25	1.43	1.51	1.53
AnotherEnd	1.10	1.33	1.40	1.58
LateSoFar	1.34	1.32	2.52	1.76
LateFuture	1.31	1.23	2.15	1.83
1.DummyA0B1	1.58	2.29	2.20	2.14
Mean VIF	1.73	2.32	3.45	1.91

Source : by the author

4. 2-way ANOVA test

We are interested in whether two indicator variables, Class and DummyA0B1, cause different acts among subjects. To observe it, we conducted a 2-way ANOVA test. We need 2-way because we have 2 independent variables, Class and DummyA0B1. We used partial instead of sequential because the Table titled “Decision Tree for Different Types of Sums of Squares in ANOVA” in (Korstanje, 2019) judged that ours was type III and we needed to use the partial option. Choosing the partial option implied that we treated 2 variables, Class and DummyA0B1, independently and equally importantly. We also included DummyA0B1#Class to examine the interaction between DummyA0B1 and Class. The outcome is available in Table 6 below.

Table 6 : 2-way ANOVA test

Source	Partial SS	df	MS	F	Prob>F
Model	1314.9038	5	262.98076	1.27	0.2799
DummyA0B1	394.66771	1	394.66771	1.91	0.1695
Class	418.43146	2	209.21573	1.01	0.3664
Dum./myA0B1#Class	498.69104	2	249.34552	1.21	0.3027
Residual	27713.459	134	206.81686		
Total	29028.363	139	208.83714		

Source : by the author

Table 6 tells us that none of 3 variables are significant because $Prob > F$ is never less than 0.05 for any of DummyA0B1, Class, and DummyA0B1#Class. This implies that we cannot reject that a subject would offer the same numbers of helps to others regardless of their reading the ant not giving food to the grasshopper version (version A), or the ant giving food to the grasshopper version (version B), which age class they were in (grade 4-6, grade 7-9, or grade 10-12). Table 6 also showed the interaction of the version and the class. Therefore, we do not need further analysis. If we had obtained at least any one of 3 variables in 2-way ANOVA, that is DummyA0B1, Class, and DummyA0B1#Class, we would have further analysis. For example, we could have examined which class acted differently from other classes and in a positive or negative direction by using dummy variables in multiple regressions if the Class variable had been significant in Table 6.

5. Conclusions and future research

Adults read folklore to us when we were very small and then we read folklore by ourselves. Each folklore tells us a lesson. For example, the original version of The Ant and the Grasshopper in Aesop (Version A in our survey) tells us that we'd better be farsighted, and we need to work hard to prepare for the future. On the other hand, Version B tells us that someone might help us when we are in trouble even due to our laziness. We found that the variable, Appropriate, which reflected a subject's culture was statistically significant in multiple regressions except for class C. It means as the culture was more established as a subject grew, it gave a big impact on his/her behavior. Therefore, parents' and nursery schools, kindergartens, and lower grades of elementary school teachers' choices of which folklore to read to children give a big influence on children's behaviour in the long run. (Kids Academy, n.d.a) offers a worksheet for The Ant and the Grasshopper. It was aimed at Grade 2 students and there are several multiple-choice questions. More precisely, a student needs to choose one of three choices. Among three choices, one of them is always totally irrelevant, one is on the grasshopper side, and one is on the ant side. For example, on the first page, the ant worked hard to stock food for the winter while the grasshopper enjoyed the summer by playing music. When the winter came, the grasshopper had no food while it saw that the ant had plenty of food. The grasshopper realized how foolish he was. At the bottom of the first page, there are three choices. The first one is: you should not waste sunshine working hard, the second one is: work today and you can be ready for tomorrow, and the third is: summers are hot, and winters are cold. The correct answer is the second choice. (Kids Academy, n.d.b) also offers version 2 on the second page. In version 2, the grasshopper played with its friend, the rabbit, together in the summer while the ant also liked to play but carried the food back and forth to prepare for the winter. When the winter came, the ant had a lot of food, but the grasshopper was hungry and could not find food in the covered snowfield. Then, they ask about the message of the story. Three choices again. The first is: you should be friends with rabbits, the second is: you don't need to do any work, the third is: you should plan for tomorrow. The correct answer is the third choice. This kind of worksheet is offered by many companies. Using it in class and discussing each student's choice in small groups is an effective method to teach the message of folklore in

school. Parents also can use a worksheet at home and talk about their kids' choices together to tell their kids the message of the folklore and teach small children about morals and ethics.

Some topics are left for future research. Firstly, as we noted in section 2, there might be a better variable to measure the effect of story reading on a subject's behaviour. It is because of the variable we chose, those who received help were the only ones who enjoyed benefit from HelpBefore and HelpAfter while a subject could not enjoy the benefit unless some emotional satisfaction if any. The outcomes might change if we had chosen a variable whose benefit a subject could have enjoyed fully. We reached this conclusion because Baba (2021) chose study hours as a variable whose benefit a subject could have enjoyed fully and obtained the result that the version was significant at 0.01 level. Searching for another suitable variable is the task in the future.

Secondly, as we noted in section 2, we would like to offer a simpler version of the questionnaire to preschool kids and Grade 1-2 students. We found the website "Grade 2 Reading Comprehension Worksheet The Ant and the Grasshopper" which asked 5 questions to Grade 2 students to check their understanding of the content. Therefore, Grade 2 is the appropriate age for the survey. In Japan, a child starts school at the age of 6 or 7 depending on his/her birthday, but many kindergartens teach them reading and writing hiragana (the simplest Japanese character among 3 characters) and most 4-5-year-old kids can read a simple story such as The Ant and the Grasshopper. So, conducting surveys to preschool and Grade 1-2 students is our desired subject and we need to search for an opportunity. Those who encountered and read The Ant and the Grasshopper for the first time do not have prefixed meaning about the story and can construct meaning from blank. Therefore, examining the story's effect on them is pure and is desirable to analyze their change of acts.

Thirdly, although (Mar et al., 2006) found no gender difference in their survey, it is still interesting to compare the effect of stories on subjects' behaviours of those who go to boys-only schools and those who go to girls-only schools because students spend mainly with boys (resp. girls) at boys-only schools and they represent their gender very well.

Lastly and most importantly, we would like to use Functional near-infrared spectroscopy (fNIRS) which measures the change of blood flow in the brain. The change of cerebral blood flow in the brain reflects the affordance of perceptual changes. This method was already used by (Nakagome, 2018) and (Karim et al., 2012) successfully in measuring communion sense and simulating balancing activity respectively.

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