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Dichotomous Thinking and Anger Regulation: A Cross-Cultural Comparative Study between Japan and Turkey

Kamran Aliyev[1], Nanami Sawada[2], Atsushi Oshio[3], Vesile Senturk Cankorur[4]

[1]Department of Psychiatry, Madalyon Psychiatry Center, Ankara, Turkey
[2]Graduate School of Letters, Arts and Sciences, Waseda University, Tokyo, Japan
[3]Faculty of Letters, Arts and Sciences, Waseda University, Tokyo, Japan
[4]Department of Mental Health and Diseases, Ankara University Faculty of Medicine, Ankara, Turkey
Email: dr.kamran.alyev@gmail.com

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Abstract

Background: Binary or dichotomous thinking can lead to propensity for aggression throughout a person's life being an essential part of a person's mentality and cultural code. Both dichotomous thinking and aggressiveness negatively affect a person's resistance to stress and it hinders an adequate stress coping style. **Aim:** The aim of this study is to make a comparative analysis of dependence of different types of anger on the dichotomy of thinking in different cultures. **Method:** A Japanese sample consisted of 226 university students (180 females) whereas a Turkey sample included a total of 243 university students (145 females) who participated in an online survey applying socio-demographic forms, State-Trait Anger Expression Inventory, the Dichotomous Thinking Inventory. Multigroup Confirmatory Factor Analyses (MGCFAs) were conducted to examine measurement invariance of the DTI and STAXI using structural equation modeling. Multiple regression analyses were examined to assess the degree to which such a cultural aspect as of dichotomous thinking predicted the different anger traits. **Results:** Results of the multiple regression analysis for State Anger and Trait Anger demonstrated that the effect of the country indicating State Anger to be higher in Turkey than in Japan. A noticeable negative effect of the country was also significant indicating Trait Anger to be higher in Japan than in Turkey. Furthermore, Japanese people had lower dichotomous thinking scores than Turkish people. **Conclusions:** The results confirmed previously proposed cultural differences, as well as opened up new avenues for exploring cultural pathways.

Keywords

Dichotomous Thinking, Dichotomous Belief, Preference for Dichotomy,

Anger Regulation, Trait Anger, State Anger

1. Introduction

Dichotomous or binary thinking is the tendency of thinking from the standpoint of opposing pair, i.e. light/darkness, positive/negative, beautiful/ugly, hot/cold and so on. Dichotomous thinking is considered a cognitive distortion of human consciousness because it prevents us from seeing the world as it usually is: complex, dynamic, changing, and full of all the shades in between. It is associated with negative psychological traits such as aggression, cognitive biases, and personality disorders, particularly with cluster B personality disorders (Oshio, 2009).

In the world view of the Manichaean religion, which is one of the best examples of dichotomous thinking, divine light and darkness stand face to face as two rivals. In the struggle of these two with each other, some of the light is trapped in the darkness (in the world). Manichaeism is a religion of universal character founded by Mani (216-277), and this religion also spread among the ancient Turks. Manichaeism is a dualistic religion. In dualist religions, the principle of goodness represented by light and fire, and its army, the heavenly deities, were in a constant war against the evil principle and evil spirits represented by darkness and matter. According to this religion, the world we live in is composed of good and bad elements. The soul of man represents goodness, and his body represents evil in this religion (Zengin & Yaman, 2018).

Anger is a negative emotion varying in intensity from slight irritation to more pronounced rage, and the underlying psychobiological processes are associated with expressed psycho-physiological activation of organism (Buss & Perry, 1992). According to Spielberger (1996), there are two types of anger: temporary anger and trait anger. Temporary anger appears by coincidence caused by a certain situation and the severity varies according to the degree of assault, unfairness, or frustration that the individual perceives at a particular point in time. Generally, trait anger is described as a situational characteristic where one experiences within a certain time relatively frequent anger, with varying degrees of intensity (e.g., mild irritability, intense rage) (Buss, 1961; Siegman & Smith, 1994).

The degrees of expression of anger vary across individuals. Such a component of anger as Anger-in is the process of suppressing one's anger and directing it towards himself/herself and not expressing it outward. Anger-in or anger prevention is considered to be the way of the human mind to hide and direct it inside trying to control the anger using the mechanism of repression. Anger-in has been shown in some articles to be related to irritability, guilt, and rumination. In contrast to this Anger-out can be viewed as the opposite, where the individual usually expresses their anger outward in a tangible way, typically either physically or verbally as aggression (Yamaguchi, Kim, Oshio, & Akutsu, 2017). Some

studies consider anger expression not only to be a reflection of a person's negative reaction, but also a stimulus of demonstrating superiority, advantage and power as well (Tiedens, 2001).

According to the Need-Emotion Organization hypothesis anger is an automatic negative reaction to the failure of satisfying the need for dominance since it is a negative reaction to the unmet needs (Aliyev & Senturk Cankorur, 2018). Different reasons of environmental and internal world, as physiological needs, social and cultural customs, negative emotions (like fear, anger), impulsion, attachment style, self-regard, ability to solve problems, ruminative thinking, direction of thinking and limitation of objective thinking can cause aggression (Nagtegaal & Rassin, 2004; Vierikko, Pulkkinen, Kaprio, & Rose, 2006; Voulgaridou & Kokkinos, 2015).

Studies have frequently used social-cognitive information processing theory (SCIP) to explain mechanisms of human aggression (Anderson & Huesmann, 2003; Boxer & Dubow, 2001). Taking into consideration some environmental factors causing aggression while solving problems the SCIP proposes the following macro-processes: 1) programming and cognitive understanding/remembering of different environmental problems, 2) setting and choosing goals, conduct, 3) formation of various scripts to guide behavior, 4) evaluating the selected script for appropriateness on several dimensions, and 5) behavioral enactment followed by an estimate and interpretation of others' responses. According to this theory delusions and cognitive distortions are associated with aggression in these social cognitive processing processes (Tone & Davis, 2012).

Dichotomous thinking and aggression are thought to have a few ways of the linkage mechanism. First, dichotomous thinking may lead to impaired cognitive control, and extreme emotional reactions when stimulated, impeding emotional regulation processes, and leading to problematic uncontrolled behavior as aggression (Gross, 2002). Second, developing and establishing a pattern of knowledge personality influences the objective evaluation of the meaning and reason of the negative emotion (Anderson & Huesmann, 2003). Third, dichotomous processing of information and appropriate perception of the outside environment can cause anger, i.e. uncontrollable emotions. The current hypotheses mean dichotomous thinking to effect both on aggressive conduct and personality, as well as cognitive issues of aggression (Oshio, 2012). Dichotomous or binary thinking is supposed likely to affect all the processes proposed by SCIP; it is the propensity to think in category of binary oppositions, binary poles (i.e., "black or white," "good or bad," "positive or negative," "all or nothing") (Oshio, 2009).

Previous studies also reported cultural differences among different peoples regarding emotion regulations and anger expressions. Identifying relational co-regulation of both the facet of social factors and facet of individual approaches (De Leersnyder, Boiger, & Mesquita, 2013), investigated the emotional control relating to the cultures under the study (Akutsu, Yamaguchi, Kim Min-Sun, & Oshio, 2016).

Boiger, Mesquita, Uchida, & Feldman Barrett (2013) concluded that express-

ing anger was culturally treated as a normal emotion in the USA, while it was culturally disapproved in Japan being the reason for the higher frequency of cases connected with anger in the USA than in Japan. According to the study, anger was disapproved of in Japan, so people would be accustomed to repress and control it, thus avoiding it to have a negative influence on life. But forcibly suppressing this negative emotion and keeping it inside made people feel more stress in the USA (Akutsu et al., 2016). According to Park et al. (2014), the dominance aspect of anger expression is more prominent in Japan than in the USA. Turkish females and males had higher anger than those in Japan (Ozkarar-Gradwohl, Narita, Montag, Panksepp, Davis, Yama, & Scherler, 2018).

The aim of this study is to compare the dichotomous thinking and anger level between Japanese and Turkish cultures. First, this study will compare the mean values of dichotomous thinking and anger in Japan and Turkey. Second, this study will compare the relationship between dichotomous thinking and anger in Japan and Turkey.

2. Materials and Methods

Participants and the procedure

A Japanese sample consisted of 226 university students (180 females) who participated in an online survey. Mean age was 19.7 (18 to 27) years old (SD = 1.3). A Turkey sample included a total of 243 university students (145 females) participating in an online survey. Mean age was 20.8 (18 to 32) years old (SD = 2.4). Both data were collected from fall 2020 to early spring in 2021. The criteria for inclusion in the study were determined as follows: volunteers over the age of 18 with literate skills.

The study was approved by the Ethics Committee of Ankara University Faculty of Medicine (approved the study on July 9th, 2020, reference number: I7-399-20).

Measures

Dichotomous Thinking

The Dichotomous Thinking Inventory (DTI: Oshio, 2009) was used to assess individual differences of black-and-white styles of thinking. The scale consists of 15 items and uses a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). DTI was originally developed in the Japanese and the Turkish version was created by Aliyev et al. (2018).

Anger traits

The State-Trait Anger eXpression Inventory (STAXI: Spielberger, 1996) was used to assess multiple domains of anger. It consists of five components: State Anger (10 items), Trait Anger (10 items), Anger-In (8 items), Anger-Out (8 items), and Anger-Control (8 items). Ratings of the items are on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree).

3. Data Analysis

Multigroup Confirmatory Factor Analyses (MGCFAs) were conducted to ex-

amine measurement invariance of the DTI and STAXI across the countries using structural equation modeling. Configural, metric/weak invariance model (factor loading equality constraint), scalar/strong invariance model (factor loading and intercept equality constraint), and strict invariance model (factor loading, intercept, and residuals equality constraint) were chosen for the analyses by us. Subsequently, we obtained the descriptive statistics and correlation coefficients among the variables. Multiple regression analyses were examined to assess the degree to which aspect of dichotomous thinking that predicted the anger traits in addition to demographics of gender, age, and countries.

4. Results

Confirmatory factor analysis

According to the results of the MGCFA, we compared fit indices of the four and three-factor models of the DTI. While Akaike's Information Criterion (AIC: Akaike, 1974) of the metric/weak invariance model was the best of the four models, Bayesian Information Criterion (BIC: Schwarz, 1978) was the best for the scalar/strong invariance model. The comparative fit index (CFI; Bentler, 1990) and the root-mean-square error of approximation (RMSEA; Steiger, 1990) were the best for the metric/weak invariance model.

We tested the MGCFA for five-factor models, State Anger, Trait Anger, Anger-In, Anger-Out, and Anger-Control, of the STAXI comparing fit indices of the four models. The metric/weak invariance model was the best fit of the four models. Considering acceptable fit the RMSEA was 0.075 for the model (Hu & Bentler, 1999). The results supported metric/invariance of DTI and MGCFA across the countries.

Descriptive statistics

Table 1 shows means and SDs for DTI and STAXI scores, as well as the test results of mean differences between the countries. Significant mean differences were obtained only except for the Anger-Out. Japanese people showed higher Trait Anger, and lower dichotomous thinking scores, State Anger, Anger-In, and Anger-Control than Turkish people.

Correlation

Table 2 shows correlation coefficients among the variables of DTI and STAXI for both countries. Preference for Dichotomy shows a significant positive association with State Anger and a negative relationship with Anger-In. Dichotomous Belief had significant positive relations with State Anger and Trait Anger. There were no significant relationships between Profit-and-loss Thinking and STAXI scores.

Multiple regression analysis

Results of the multiple regression analysis for State Anger and Trait Anger are reported in Table 3. A significant positive effect of Preference for Dichotomy and a negative effect of Profit-and-loss were found for State Anger. The effect of the country indicating State Anger to be higher in Turkey than in Japan was

Table 1. Descriptivestatistics of DTI and STAXI for Japan and Turkey.

		Japan		Turkey		Meancomparison		
		M	*SD*	*M*	*SD*	*Coen's d*	*t*	*p*
DTI								
	PreferenceforDichotomy	16.82	4.15	21.51	4.14	1.13	12.26	<0.001
	DichotomousBelief	10.84	4.05	13.10	4.78	0.51	5.51	<0.001
	Profit-and-LossThinking	20.28	3.91	22.43	3.53	0.58	6.24	<0.001
STAXI								
	StateAnger	12.83	4.01	15.73	5.73	0.58	6.32	<0.001
	TraitAnger	21.90	5.29	19.59	4.82	0.46	4.95	<0.001
	Anger-In	21.65	3.71	18.45	4.22	0.54	5.85	<0.001
	Anger-Out	15.97	3.96	15.44	3.42	0.15	1.57	0.12
	Anger-Control	21.78	4.32	24.07	4.16	0.80	8.69	<0.001
	n	226		243				

Table 2. Correlationcoefficientsamongthevariables.

	1.	2.	3.	4.	5.	6.	7.	8.
DTI								
1. PreferenceforDichotomy	–							
2. DichotomousBelief	0.54***	–						
3. Profit-and-LossThinking	0.62***	0.42***	–					
AngerExpression								
4. StateAnger	−0.15***	0.17***	0.03	–				
5. TraitAnger	−0.03	0.11*	0.07	0.16***	–			
6. Anger-In	−0.14**	−0.02	0.04	−0.03	0.19***	–		
7. Anger-Out	0.03	0.02	0.06	0.11*	0.45***	0.08	–	
8. Anger-Control	0.09	0.01	0.09	−0.01	−0.38***	−0.01	−0.51***	–

N = 469, ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

found as well. Interactive effects of Preference for Dichotomy and the country, and Profit-and-loss Thinking and the country were also significant. A considerable positive effect of Dichotomous Belief and an interactive effect of Profit-and-loss thinking, and the country were significant for Trait Anger. A noticeable negative effect of the country was also significant indicating Trait Anger to be higher in Japan than in Turkey. A significant positive impact of Profit-and-loss Thinking, an effect of the country (Japan > Turkey), and an interactive effect of Profit-and-loss Thinking and the country were significant for Anger-In. There was only a significant effect of the country indicating people in Turkey to

Table 3. Results of themultiple regression analysis.

	StateAnger				TraitAnger			
	B	*SE B*	*beta*	*p*	*B*	*SE B*	*beta*	*p*
Intercept	14.7	0.26	–	<0.001	21.04	0.26	–	<0.001
DTI								
PD	0.03	0.07	0.03	0.693	−0.03	0.07	−0.03	0.712
DB	0.20	0.06	0.17	0.001	0.20	0.06	0.18	0.001
PT	−0.16	0.08	−0.12	0.038	0.11	0.08	0.08	0.182
Country	2.49	0.54	0.24	<0.000	−2.71	0.55	−0.26	<0.001
PD × Country	−0.04	0,15	−0.02	0.791	−0.09	0.15	−0.04	0.533
DB × Country	−0.28	0.12	−0.12	0.020	−0.03	0.12	−0.01	0.835
PT × Country	−0.31	0.15	−0.11	0.047	−0.40	0.16	−0.14	0.011
Control variables								
Gender	−0.38	0.51	−0.03	0.455	−1.31	0.51	−0.12	0.011
Age	0.17	0.12	0.07	0.143	0.05	0.12	0.02	0.649
R^2			0.14	<0.001			0.13	<0.001

	Anger-In				Anger-Out				Anger-Control			
	B	*SE B*	*beta*	*p*	*B*	*SE B*	*beta*	*p*	*B*	*SE B*	*beta*	*p*
Intercept	20.02	0.21	–	<0.001	15.92	0.20	–	<0.001	22.68	0.22	–	<0.001
DTI												
PD	−0.04	0.06	−0.04	0.543	0.02	0.06	0.03	0.702	−0.05	0.06	−0.05	0.434
DB	0.06	0.05	0.07	0.195	0.01	0.05	0.01	0.881	−0.07	0.05	−0.08	0.160
PT	0.15	0.06	0.13	0.018	0.06	0.06	0.06	0.294	0.08	0.07	0.07	0.244
Country	−3.34	0.43	−0.39	<0.001	−0.78	0.41	−0.11	0.58	2.34	0.47	0.27	<0.001
PD × Country	0.21	0.12	0.10	0.072	−0.20	0.11	−0.11	0.070	0.22	0.13	0.10	0.089
DB × Country	−0.14	0.10	−0.07	0.153	0.08	0.09	0.05	0.370	0.03	0.10	0.02	0.746
PT × Country	−0.38	0.12	−0.16	0.002	−0.06	0.12	−0.03	0.622	0.03	0.13	0.01	0.821
Control variables												
Gender	−1.12	0.40	−0.12	0.006	0.36	0.38	0.05	0.346	0.12	0.44	0.01	0.792
Age	0.06	0.10	0.03	0.558	−0.09	0.09	−0.05	0.315	0.17	0.10	0.08	0.100
R^2			0.20	<0.001			0.03	0.133			0.10	<0.001

Note. DTI = DichotomousThinking Inventory, PD = PreferenceforDichotomy, DB = DichotomousBelief, PT = Profit-and-loss Thinking. Country: 0 = Japan and 1 = Turkey. Gender: 0 = Femaleand 1 = Male.

show more Anger-Control than the people in Japan for Anger-Control. The coefficient of determination (R^2) was not significant and there were no significant effects for Anger-Out.

Simple slope analyses were conducted due to significant interactive effects for State Anger, Trait Anger and Anger-in. As described on the left side of Figure a positive effect of Dichotomous Belief was significant on State Anger in Japan (b = 0.30, p < 0.001), while having no significant effect in Turkey (b = 0.05, n.s.). The right side of Figure 1 demonstrates a significant negative effect of Profit-and-loss Thinking found on State Anger in Turkey. (b = −0.24, $p < 0.05$), whereas no effect was found in Japan (b = −0.01, n.s.).

Figure 2 shows a result of simple slope analysis for the interactive effect of Profit-and-loss Thinking and country on Trait Anger. A positive effect of Profit-and-loss Thinking on Trait Anger being significant in Japan (b = 0.22, $p < 0.01$), while no effect was found in Turkey (b = −0.07, n.s.). Figure 3 demonstrates the results of simple slope analysis for the interactive effect of Profit-and-loss Thinking and country on Anger-In. A significant positive effect of Profit-and-loss Thinking on Anger-In was found in Japan (b = 0.30, $p < 0.001$), while being insignificant in Turkey (b = −0.04, n.s.).

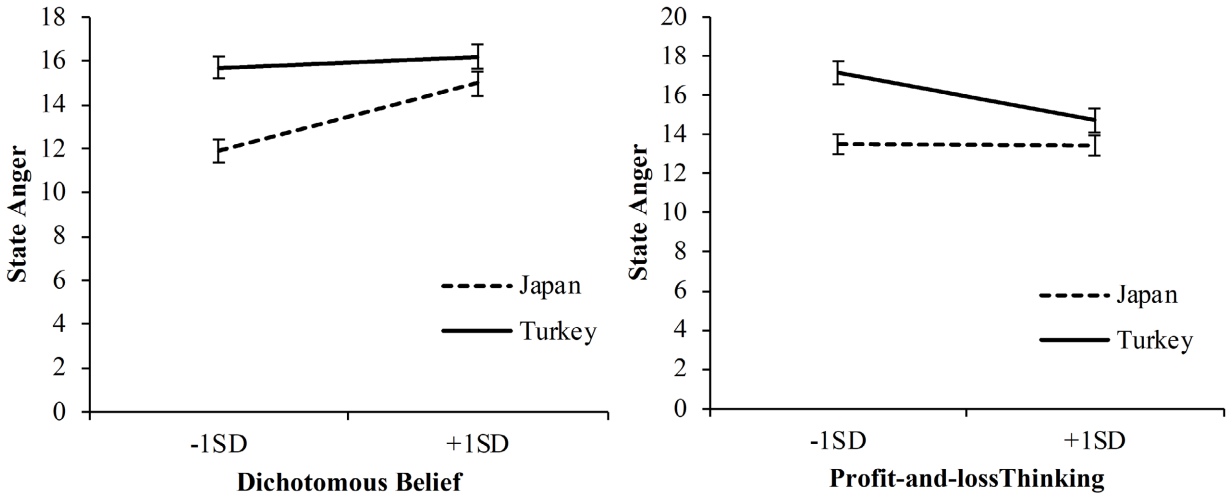

Figure 1. Significant interactive effect for State Anger.

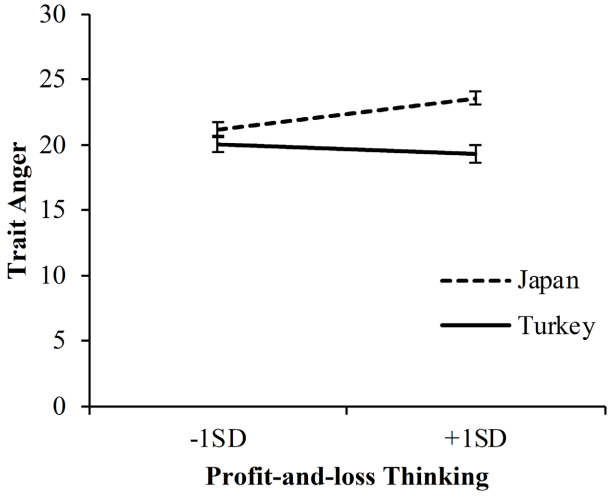

Figure 2. Significant interactive effect for Trait Anger.

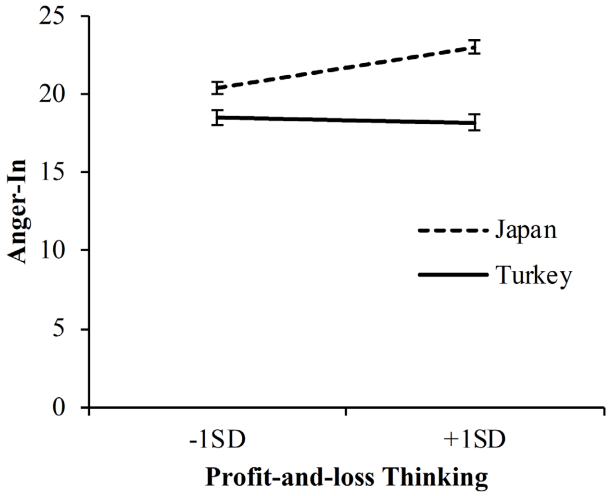

Figure 3. Significant interactive effect for Anger-In.

5. Discussion

Anger types and dichotomous thinking scores were compared in this study in Japan and Turkey, as well as the associations between dichotomous thinking and anger types in these cultures were searched by us. Significant mean differences were obtained only except for the Anger-Out between the cultures. The Japanese people showed higher Trait Anger and Anger-In, while the Turkish people demonstrated higher State Anger and Anger-Control. Furthermore, the Japanese people had lower dichotomous thinking scores than the Turkish people. Ozkarar-Gradwohl et al. (2018) reported that both the Turkish females and males had higher anger than the Japanese. The current study explored probable cultural differences in parenting and mothering styles, and family patterns about expressing anger towards a child in that study. The aggressive reaction of the Turkish mothers has been observed to be more prominent to their children's anger than the Japanese.

According to Boiger et al. (2013), anger is a culturally disapproved emotion in Japan in contrast to the USA and it was the result of anger situations in the USA to be more than in Japan. But anger is accepted to be a culturally tolerated emotion in the society and it is the preference of people to control it or not in the USA. On the contrary, according to Japanese culture when anger is considered a culturally disapproved emotion, it is probably to be socially and structurally controlled to maintain social harmony. In this case, people may not have much freedom and choice to regulate and control anger in their own way independently and they are interdependent self-controls. This may be considered the reason for Trait-Anger levels being relatively higher and respectively State-Anger lower in Japan compared to the USA and Turkey.

Japan and Turkey, despite the fact that they have a certain cultural similarity, they also have a significant difference. This is due to the following reasons: regionally, Japan is located in East Asia, being a classic island state, and Turkey is located quite far from Japan, being a continental state, at the board of Western

Asia and Europe. These countries have different religions and belong to different language groups. The similarity between these countries is that both countries came from outside of western civilization, they had to modernize and integrate into western civilization in similar historical ways (Pehlivanturk, 2012). The special ecological environment of islands endows four cultural characteristics, as follows: firstly, the geographic space of islands determines their isolation from continental culture; secondly, the ecological environment of islands determines their marine-focused characteristics of culture; thirdly, the mobility and cross-border nature of islands plays a transitional and connecting role in the land-sea interaction from the perspective of cultural transmission (Ma, 2020).

The present study showed dichotomous thinking to be more associated with state-anger than trait-anger. Thus, dichotomous thinking primarily contributes to more pronounced state-anger. Dichotomous thinking as a specificity of the cultural code is relatively strongly developed contributing to a higher aggressiveness in the people of Turkey.

6. Limitations

First, as our study has been conducted with young adults and the information is based only on them, there are still uncovered issues between culture and anger, and it is impossible to give a complete evaluation without involving people of different ages including older adults. Second, since the participants of our study were only from Turkey and Japan, the current study is valid within these two cultures. To give wider information about this theme we have to study different cultures and broaden our research by conducting it in other countries. Third, we have used only the self-report method to conduct the measurement of all constructs in this study. Thus, we think that studies by applying different measurements and gathering detailed information from various sources would not only be very important, but also would have an additional scientific value. Finally, yet importantly, our study focuses on anger regulation, but we believe that examining other emotions will provide synergistic value.

7. Conclusion

Our results highlight that across cultures, people express more of those emotions that help them to be appropriate in their culture, in the context of their daily social interactions. In addition, each culture contributes to a certain style of thinking, which has a significant impact on the emotions and character traits of a person. These results confirmed previously assumed cultural differences, and also opened up new opportunities for studying the impact of culture on the style of thinking and emotional sphere of a person.

Ethics Approval and Consent to Participate

Ethical approval for the study was acquired from the Department of Mental Health and Diseases Ethics Committee of Ankara University Faculty of Medicine

(approved the study on July 9th, 2020, reference number: I7-399-20).

In line with the Declaration of Helsinki (1964), electronic informed consent was obtained from all participants before beginning the survey, and participants were notified that they may terminate their participation in the study at any point.

Human and Animal Rights

No animals were used for studies that are the basis of this research. All the humans were used in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

Consent for Publication

Informed consent was obtained from all subjects involved in the study.

Availability of Data and Material

Data will be provided upon request.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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