

EXPERIENCE OF CREATIVITY AND INDIVIDUAL CULTURAL VALUES IN IDEATION

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ABSTRACT

The influence of culture on design is reflected in many aspects, such as design creativity, communication within design groups, and individuals' creative performance. Culture has a profound impact on design. For example, studies have identified the positive effect of a higher individualism-collectivism value on design team performance. To examine the influence of individual cultural values on the experience of creativity in ideation, we experimented by recruiting participants from different countries to complete two ideation tasks. Moreover, we collected their cultural values and experiences of creativity through two questionnaires. We also examined the connections between individuals' cultural values and their experiences of creativity in ideation. The results show five correlations between individuals' cultural values and their experiences of creativity when the country setting was a control variable. Recommendations based on the findings include that explorations of cultural influence and the relationship between culture and design or other fields unrelated to the country or society level have to measure individual cultural values (with the country setting as a control variable) instead of adopting country cultural scores.

Keywords: Collaborative design, Design practice, Creativity, Experience of creativity, Cultural influence

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1 INTRODUCTION

Numerous studies have explored the relationship between culture and creativity or the influence of culture on creativity or design (Andrés, 2007; Gong *et al.*, 2022; Gong, Wang, *et al.*, 2023; Kirjavainen and Björklund, 2019; Mattila *et al.*, 2019; Petermann *et al.*, 2007; Turner and Agyemang, 2017). For example, a barrier to design activities in East Asia (Taoka *et al.*, 2018) is not sharing ideas freely within a hierarchy (Taoka *et al.*, 2017), resulting from a higher power distance (Hofstede, 2001). However, when utilizing tools designed for Japanese to mitigate cultural influence in idea generation and evaluation, the participants showed a higher level of engagement in ideation (Taoka *et al.*, 2018). Another study recruited 32 students from 17 countries to perform a concept design and analysed the correlation between cultural variables and creativity, such as the number of ideas, which showed that individualism positively affected the number of ideas and sketches (Wodehouse *et al.*, 2011). However, they also identified a limitation of applying Hofstede's national cultural score as a variable.

Although culture and creativity are complicated topics, we explore the relationship between them from a particular perspective—the relationship between individual culture and the experience of creativity—to better understand the relationship between individuals' culture and their feelings during ideation, based on non-design students. The paper's structure is organized as follows. After developing a framework and introducing the relevant theories and terms in Section 2, we present the experiment in Section 3, which explains the applied creative methods, participants, procedures, and tasks. The analyses of reliability and correlation are reported in Section 4. A discussion related to the obtained correlations between individual culture and the experience of creativity is presented in Section 5. Moreover, we illustrate the limitations of our study and our future work in Section 6. Finally, we conclude the work and summarize the contribution of our study in Section 7.

2 BACKGROUND THEORY

Many studies focus on the influence of culture in creativity and design, such as company culture and culture of collaboration, to integrate into product development in the industry (Kirjavainen and Björklund, 2019), designing culturally aware tools for idea generation and evaluation (Taoka *et al.*, 2018) and cultural influence in a design process (Gautam and Blessing, 2007, 2009). Focusing on the relationship between individuals' culture and their experience of creativity in the ideation phase, we briefly explain the relationship between culture and creativity based on previous theories. Furthermore, we clarify the terms applied to our study (individual culture and experience of creativity).

2.1 Relationship between culture and creativity

Although examining the relationship between culture and creativity is challenging, many researchers have explored the connection between culture and creativity in design from different perspectives and have applied different measurements. To better understand the connection between culture and creativity, we attempted to build a framework based on Hofstede's cultural dimension theory and the 4Ps model of creativity, as shown in Figure 1.

Culture is included in the collective level, in human mental processes: universal as all humans common, such as laughing and eating, collective as humans learn, develop and share in localised groups and individual as "something unique to each individual and is a complex combination of learned and inherited traits" (Hofstede, 2001; Wodehouse *et al.*, 2011, p. 2), shown in Figure 1 by transparent grass green ovals. This means all human beings' mental processes (ideation phase in our study) have been influenced by culture (the collective level of mental processes, such as national culture) and, based on personality, formed our own individual culture.

Creativity refers to a person communicating a "new concept (which is the product). Mental activity (or mental process) is implicit in the definition, and of course no one could conceive of a person living or operating in a vacuum, so the term press is also implicit" (Rhodes, 1961, p. 305), one of the most well-known definition, cited by many researchers, such as Soomro *et al.* (2022). This means a person interacts with the press (a collective element based on Hofstede's cultural dimension theory), shaping his/her own individual culture (included in the individual element based on Hofstede's cultural dimension theory), as illustrated in Figure 1. Moreover, a person's thought process (ideation phase in our study) generates products (ideas) that also embody their group culture (i.e., national culture), affecting individuals. For example, a study described three collections with cultural identities, such as

pottery, that revealed a very typical Brazilian and Portuguese culture when two designers from Brazil and Portugal design together (Dornas, 2019).

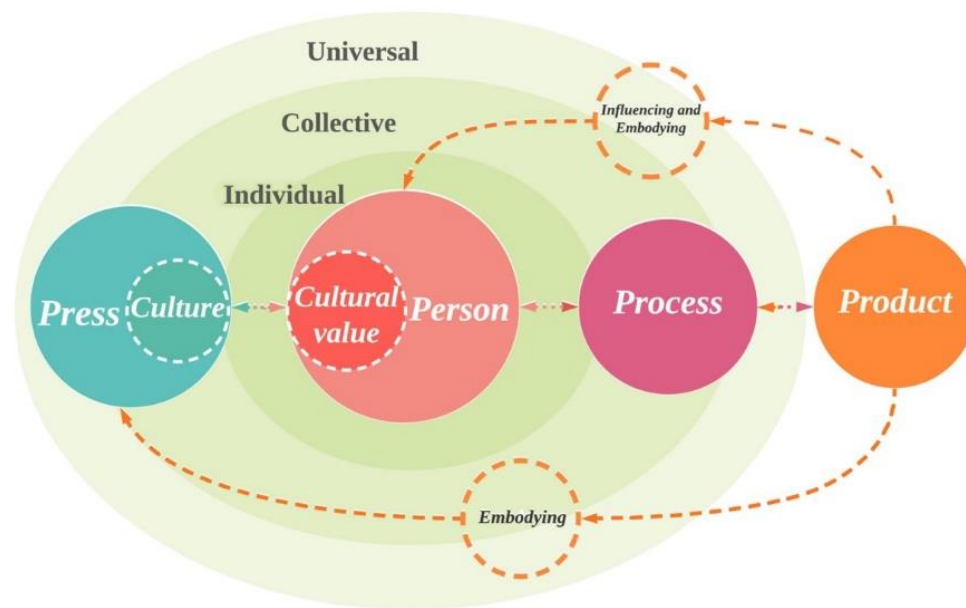


Figure 1. A framework of the relationship between culture and creativity based on Hofstede's cultural dimension theory and the 4Ps of creativity

Our current study focuses only on the relationship between individual culture and experience (feelings) during the ideation phase, as highlighted by the blue oval frame in Figure 2. Therefore, we explain the individual culture and experience of creativity separately.

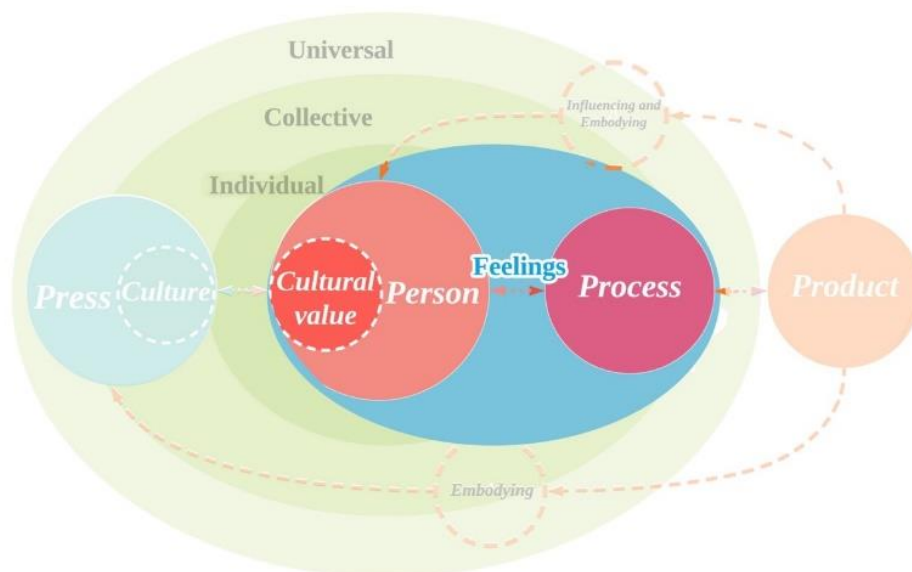


Figure 2. The focus of our study is based on the proposed framework

2.2 Individual culture

Based on Hofstede's culture theory, human mental programming is divided into three elements (universal, collective, and individual) and determined by brain cells, which cannot be observed. Our behaviours and words are the only way to understand the human mental programming (Hofstede, 2001). Culture is defined as "the collective mental programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede, 2001, p. 9), belonging to collective human mental programming. Hofstede collected cultural data within a large corporation, analysed national culture differences and identified five dimensions: power distance (PD), uncertainty

avoidance (UA), individualism versus collectivism (IC), long-term versus short-term orientation (LSO) and masculinity versus femininity (MF).

- PD is related to different expectations and acceptance regarding power being distributed unequally (Hofstede, 1991, 2011; Wodehouse *et al.*, 2011).
- UA is related to stress level and the feeling of threat in the face of uncertain or unknown situations (Hofstede, 2001).
- IC is the strength of ties in which people are integrated into primary groups (Hofstede, 2011).
- LSO is related to the choice of focus for people's efforts (for the future or present) (Hofstede, 2011).
- MF is related to the distribution of emotional roles between genders (Hofstede, 2011).

Hofstede scores are a commonly applied measurement in culture research (Hofstede, 2001). However, Hofstede (2001) mentioned that although most people in a given society are programmed similarly, we cannot deny the considerable difference between individuals in the same society; this means that it is not suitable to apply the cultural dimension index when the study is not related to the country or society (Hofstede, 2001; Yoo and Shin, 2017). Therefore, researchers such as Yoo *et al.* (2011) and Yoo and Shin (2017), created cultural measurements at the individual level to measure individual cultures, which were applied in our study for the measurement of culture at the individual level, with 26 questions for measuring five cultural dimensions with acceptable reliability and validity.

2.3 Experience of creativity

The term "experience of creativity" is regarded as one branch of research on the subjectively experienced dimension of creativity from the framework of phenomenological psychology (Rawlings and Nelson, 2007). Understanding how individuals experience the creative process is related to creativity. Nelson and Rawlings (2009) also developed an experience of creativity questionnaire in two parts: experiential and existential aspects of creativity to understand the experience of the creative process.

In our study, we only focus on the experiential aspect to explore participants' experiences during the creative process (i.e., ideation phase). For the experiential aspect, the questionnaire asked 44 questions regarding the participants' feelings during the creative process (Nelson and Rawlings, 2009). However, the original work did not provide specific validity; therefore, other researchers developed a questionnaire with acceptable reliability and validity (Gong, Nanjappan, *et al.*, 2023), which we applied in our study. The questionnaire included five categories: enlightenment, anxiety, power, engagement, and pleasure.

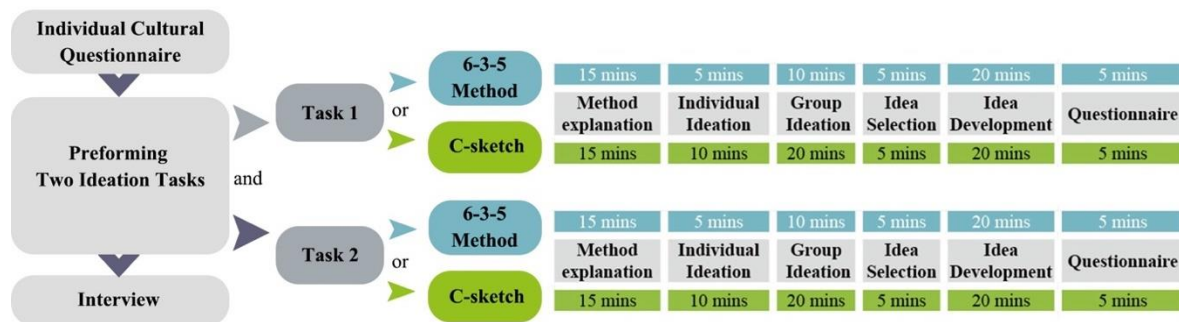
- **Enlightenment** refers to individuals experiencing a state of inspiration or enlightenment in the creative process (Gong, Nanjappan, *et al.*, 2023; Nelson and Rawlings, 2009).
- **Anxiety** relates to "a sense of vulnerability during the process and anxiety before and at the start of the process" (Nelson and Rawlings, 2009, p. 47).
- **Power** is related to being and feeling the ability and achievements in a creative process (Gong, Nanjappan, *et al.*, 2023).
- **Engagement** is related to a sense of freedom, deep immersion, the level of engagement, and individuals' sense of discovery and receptivity to the creative process (Gong, Nanjappan, *et al.*, 2023).
- **Pleasure** was a sense of pleasure and satisfaction during the creative process.

3 EXPERIMENTAL STUDY

The teams were asked to undertake concept generation activities using a variant of the 6-3-5 method and collective sketching (C-sketch), based on the study of Shah *et al.* (2001). The 6-3-5 method and C-sketch are group ideation methods where participants initially draw or write their ideas individually in the worksheet, then pass their ideas to other group members, encouraging them to contribute ideas in others' worksheets (Shah *et al.*, 2001; Törlind, 2015). The participants in this experiment were recruited from universities, with a total of 57 students from 10 countries divided into 19 teams of three group members. Participants were asked to generate ideas in two design tasks. Before the experiment, they were asked to fill in the questionnaire to collect their individual cultural values. The following experiment was broken down into two tasks with six steps (Figure 3):

- Method explanation: The instructor explained the process of the applied method.
- Individual idea generation: Participants were asked to generate three ideas on their worksheets and then pass the worksheets to other group members.
- Group idea generation: Participants were required to generate and add ideas to other group members' worksheets based on existing ideas.
- Idea selection: Participants had five minutes to ask and answer questions to avoid misunderstandings without judgment or comment.
- Idea development: Participants developed or combined the ideas on their worksheet or generated a new idea as the best idea and sketched it with annotation.
- Questionnaire: Participants were asked to fill in a questionnaire asking about their feelings during ideation.

After the two tasks, we interviewed the participants to ask about their feelings, especially when compared to previous experiences with group ideation during the experiment.



Task 1: Design a new working table that takes up as little space as possible (not in use), but provides a sufficient surface (in use).

Task 2: Arrange a small bedroom, using the space efficiently for furniture, such as the table, bed and others.

Figure 3. Experiment procedure and tasks

4 RESULTS

To analyse the relationship between individual culture and the experience of creativity, we first ran a test for each sub-scale of questionnaires to obtain the reliability of the questionnaires. We then tested the correlation between individual cultural values and their experiences of creativity.

4.1 Reliability of the applied questionnaires

The individual cultural values questionnaire had either an acceptable or good level of reliability for each sub-scale, as determined by a Cronbach's alpha of 0.74 (PD), 0.65 (UA) after removing three items with low loadings, 0.82 (IC), 0.68 (LSO) after removing two items with low loadings and 0.88 (MF) (Vaske, 2019). Also, the reliability of each sub-scale in the experience of creativity had either an acceptable or good level (Vaske, 2019), as determined by a Cronbach's alpha of 0.85, enlightenment with six items; 0.77, anxiety with five items; 0.70, power with four items; 0.71, engagement with four items; and 0.84, pleasure with two items.

4.2 Correlation between individual cultural values and the experience of creativity

Although there was a linear relationship between variables, not all variables were normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$), which means we cannot test the correlations by Pearson product-moment correlation. Alternatively, we examined the correlation between individual cultural values and the experience of creativity by Spearman's rank-order correlation. There were several statistically significant positive correlations between individual cultural values and the experience of creativity. However, we suspected these results because almost all students from one of the countries had higher scores in each subscale of experience of creativity, and the scores of the experience of creativity differed in gender, educational level and countries. Therefore, we added control variables (i.e., gender, educational level and country separately) to test the nonparametric partial correlation (Conover, 1999), as shown in Figure 4.

In Figure 4, the cell crossed by each subscale of individual cultural values and experience of creativity is divided into four smaller cells by white lines. The top-left corner is the correlation between each subscale of individual cultural values and experience of creativity without any control variable; the top-right corner is the correlation between each subscale of individual cultural values and experience of creativity when gender is set as a control variable. The lower-left corner shows the correlation between each subscale of individual cultural values and experience of creativity when the educational level is a control variable; the lower-right corner shows the correlation between each subscale of individual cultural values and experience of creativity when the country is controlled. It is clear no difference after setting gender and educational level as control variables. In contrast, when setting the country as a control variable, a few correlations were lost, which means that the county affected the sub-scales in the experience of creativity. Therefore, the results are summarised as follows, highlighted by the bold font and linear black frames in Figure 4, based on country as a control variable (cells with green background).

		Experience of Creativity									
		Enlightenment		Anxiety		Power		Engagement		Pleasure	
Individual Cultural Values	Power-Distance (PD)	.290**	.274**	.314*	.305**	.160	.133	.288**	.269**	.249**	.228*
		.281**	-.102	.307**	.229*	.150	.029	.277**	.156	.239*	.049
	Uncertainty Avoidance (UA)	-.070	-.094	-.126	-.143	.031	.000	.046	.021	.101	.076
		-.087	.021	-.130	-.085	.028	.095	.040	.123	.098	.233*
	Individualism-Collectivism (IC)	.191*	.180	-.061	-.071	-.055	-.077	-.043	-.060	-.020	.004
		.174	.141	-.073	-.107	-.069	-.113	-.069	-.111	.007	-.070
	Long-term vs Short-term Orientation (LSO)	.483*	.470**	.158	.143	.237*	.205*	.249**	.224*	.411**	.390**
		.474**	.337**	.142	.041	.221*	.105	.223*	.095	.398**	.240*
	Masculinity vs Femininity (MF)	.439**	.246**	.368**	.385**	.228**	.149	.321**	.248**	.367**	.335**
		.445**	.155	.362**	.248**	.219*	.017	.312**	.099	.359**	.045

* Correlation is significant at the 0.05 level (2-tailed).
 **Correlation is significant at the 0.01 level (2-tailed).

Figure 4. Spearman's rank-order correlation between individual cultural values and experience of creativity. A cell split into four small cells illustrating the correlation between subscales of individual cultural values and experience of creativity in four conditions. Cells with colours mean a statistical correlation between subscales of individual cultural values and experience of creativity in four conditions. Blue is no control variable (left-top corner); light orange is when gender is set as a control variable (right-top corner); pink is when the educational level is set as a control variable (left-lower corner); and green is when the country is set as a control variable (right-lower corner). The results are based on the cells with double linear black frames and the bold font when the country is set as a control variable with a green colour background (right-lower corner).

1. There was a statistically significant, moderate positive correlation between PD and anxiety ($r_s(114) = .229, p = .015$).
2. There was a statistically significant, moderate positive correlation between UA and pleasure ($r_s(114) = .233, p = .013$).
3. There was a statistically significant, moderate positive correlation between LSO and enlightenment ($r_s(114) = .337, p < .001$).
4. There was a statistically significant, moderate positive correlation between LSO and pleasure ($r_s(114) = .240, p = .011$).
5. There was a statistically significant, moderate positive correlation between MF and anxiety ($r_s(114) = .248, p = .008$).

5 DISCUSSION

There are five pairs of correlations between individual cultural values and the experience of creativity when the country is set as the control variable. Therefore, our discussion was based on the influence of cultural dimensions on the individual's feelings and experiences during ideation. Moreover, we discussed nationality as a factor influencing self-evaluation, which implies the limitation of applying the country as an independent variable in a culture-related study.

5.1 PD and anxiety

Individuals with low PD might perform better in teams, and they believe that each group member is in an equal position without stress and anxiety in design thinking (Thoring *et al.*, 2014). In comparison, individuals with high PD tend to accept social inequality, follow instructions and guidance (Thoring *et al.*, 2014) and generate ideas with lower originality in group work (Nouri *et al.*, 2015), which might be the reason for the correlation between PD and anxiety. This was especially true during the interview, when the instructor asked the participants about their feelings during the experiment. Individuals with high PD were anxious about answering questions in brief sentences (e.g., "Yes, it is good"), and individuals with low PD were more proactive in discussing the questions and expressing their feelings. For example, when the instructor asked the question, "How about your feeling during the group ideation? Especially compared to your previous experience of group ideation or group discussion?" Although almost all participants thought it was a great journey, participants with low PD tended to talk about their previous experiences more often, such as how lousy teamwork they had. However, participants with high PD only answered the question with a short reply, rather than talking about it or explaining the reasons. High PD may be the reason that they were not good at expressing or presenting their opinion, which also might be seen as the reason for the positive correlation between PD and anxiety.

5.2 UA and pleasure

The positive correlation between UA and pleasure was unexpected because the previous study demonstrated that individuals with a high UA value performed less proactively and more restlessly in ideation, and individuals with low UA appeared to be more relaxed and comfortable with ambiguous and unstructured situations (e.g., ideation) (Hofstede, 1980). However, other researchers have concluded that structured environments with strict design thinking rules and procedures might benefit individuals with a higher UA value. By contrast, individuals with a lower UA value adapt more easily to ambiguous and unstructured environments and dislike formal rules (Thoring *et al.*, 2014). Therefore, the positive correlation between UA and pleasure is more understandable because our experiment was conducted in a meeting room with clear and strict rules, timelines, and processes. In addition, we had a warm-up activity to ensure that all participants were performing tasks correctly during the explanation of the applied methods.

5.3 LSO, pleasure and enlightenment

Our analysis confirmed two positive correlations (LSO and enlightenment, LSO and pleasure), which were the same as the previous study in a single country (Gong, Nanjappan, *et al.*, 2023). In the following interview, many participants mentioned that they enjoyed group ideation by following logical steps and new creative methods. We also asked questions such as "Would you recommend or apply those group ideation methods in daily life?" One of the participants responded that he would like to recommend that other friends join our study so that next time they join group work, they could apply those methods

together. Moreover, they explained that they performed better than they thought and were joyful about joining our experiment. Our experiment let them realise that they had the ability to generate ideas, especially in design tasks they had never tried before, and they enjoyed the experiment, which might be one of the reasons for the positive relation between LSO and pleasure. In addition, in learning skills and preparing personal knowledge, an individual with a high LSO value believes it is always necessary (Kittová and Dušan, 2018), which is reasonable further to explain the positive correlation between LSO and pleasure resulting from they learned new creative methods, and they could adopt those methods for their future life. For enlightenment, there were two stages in which participants expressed inspiration from others. First, when they received others' worksheets and added ideas to others' worksheets, they were impressed and inspired by others' ideas. The second stage participants mentioned was when their worksheets were back to them and others added more creative and surprising ideas to their worksheets, inspiring them; then, they had an opportunity to develop their best ideas. Individuals with a high LSO value appreciate the future more than the present. Developing their ideas and receiving inspiration from others might explain why they have a higher score in enlightenment.

5.4 MF and anxiety

Individuals with higher MF are more aggressive and emulous and have higher task motivation than individuals with lower MF (Hofstede, 1980; Tsegaye *et al.*, 2020; Yoo *et al.*, 2011), who are more eager to succeed and perform better (Caputo *et al.*, 2019; Thoring *et al.*, 2014). In comparison, individuals with lower MF pay more attention to cooperation and caring and nurturing for others (Djamen *et al.*, 2020) rather than competition. Moreover, one study demonstrated that individuals with a higher MF were better at acting than designing, thinking and discussing (Thoring *et al.*, 2014). This might be why participants with higher MF felt more anxiety than individuals with lower MF because they were more competitive and eager to succeed; thus, under pressure, they felt anxious.

5.5 Influence of country on self-evaluation

We collected individuals' cultural values based on Hofstede's five cultural dimensions, and during the analysis, the country as another factor influenced participants' experience during ideation. Two potential inferences may explain the results; first, other cultural dimensions have not been identified, influencing participants' self-evaluation responses. Second, other factors (common actions or reactions of a country) influenced participants' replies and choices in self-evaluation. Although this requires further exploration by collecting extensive data, our results imply that setting country as an independent variable to explore the relationship between culture and creativity or design research might be inappropriate; it might be better to collect individuals' cultural data rather than applying country cultural index.

6 LIMITATIONS AND FUTURE WORK

The main limitation of this study was its non-random sample. We recruited participants from two countries, which means that most participants were natives from these countries, and only a few participants were from other countries. It would be better to conduct experiments in other countries and obtain extensive data. Another limitation is that we focused on the experience of creativity, as participants' feelings in the creative process are based on a questionnaire, which might be influenced by other factors, such as personality and country, as explained in the discussion.

For future work, we will analyse design creativity to examine the possible relation between design creativity (i.e., novelty) and the experience of creativity, as well as the influence of individual culture on design creativity. Moreover, it would be beneficial to inspire other researchers interested in designers' feelings during ideation to compare design and non-design individuals' feelings or experiences in design, such as concept design.

7 CONCLUSIONS

Our study collected individual cultural values and experience of creativity and analysed the correlation between five cultural values and the experience of creativity, which focused on individuals' cultural values and their feelings during the creative process (ideation). Our results revealed five correlations between individual cultural values and the experience of creativity: PD and anxiety, UA and pleasure, LSO and enlightenment, LSO and pleasure, and MF and anxiety. This means PD and MF values affect

individuals' feelings (anxiety); by contrast, UA and LSO values influence individuals' feelings of pleasure and enlightenment. Moreover, we discussed the reasons behind these correlations, which might assist researchers in exploring the relationship between culture and the experience of creativity or the relationship between culture and design creativity at the individual level.

Although Hofstede's cultural values scores are the mainstream measurement when researchers study cultural influence in many fields, it is better to collect data at the individual level because of the cultural difference between individuals in the same country. This means that measuring individual cultural values is more appropriate than applying national cultural values when we conduct a study to explore the influence of culture on a topic unrelated to the country or society level. Also, exploring the influence of culture and the relationship between culture and other aspects would better set the country as a control variable, because people living in the same country might have similar reactions or responses resulting from other influences rather than the identified cultural dimensions. Our study may serve as an exploratory study for helping researchers further explore this complicated topic–culture influence. Furthermore, our study verified that non-design students enjoyed concept design (ideation) and experienced feelings of pleasure and enlightenment. Although they felt anxiety during the experiment, they expressed that the feeling of anxiety drove them to generate ideas.

Overall, our study contributes to the design field from a cultural perspective by exploring the connections between culture and feelings during ideation at the individual level, which is more reasonable for studying cultural influence in design. Moreover, exploring non-designer feelings during ideation might provide a new direction for education by teaching design methods or creative methods, which not only improve individuals' creativity but also help students to solve problems in their studies and daily life.

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