

## Chapter #12

### COMPARING ONLINE AND VIRTUAL REALITY MORAL DILEMMA DISCUSSIONS: FOCUSING ON MORALITY, PERSPECTIVE-TAKING, AND COMMUNICATION SKILLS

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#### ABSTRACT

This study explored the educational effects of online and virtual reality moral dilemma discussions (OMDD and VRMDD, respectively) among university students. In Study 1, participants were randomly assigned to an OMDD or VRMDD condition, participating in both conditions in acquainted pairs. The acquainted pairs discussed Heinz's dilemmas (1) and (2). The Standards for Public Space (SPS) and Communication Skill (CS) scales were measured separately before and after the experiment. Results revealed significant differences in the main effect of both conditions for the SPS subscales. Participants scored higher on the SPS egocentric and peer standards subscales in the pre-test than in the post-test, which had significant main effects at the time of the survey. OMDD and VRMDD practice showed decreased SPS subscale scores with a narrow social perspective (egocentric and peer standards) and were not related to the subscales with a wider social perspective (regional standards, care for others, and public values) and the CS scale. Similar to Study 1, VRMDD was conducted in the same manner in Study 2. SPS and the Interpersonal Reactivity Index scales were measured before and after the experiment. The results of Study 1 were replicated, and VR perspective-taking was confirmed.

*Keywords:* online moral dilemma discussion, virtual reality moral dilemma discussion, virtual reality perspective-taking, morality

#### 1. INTRODUCTION

The frequency with which internet-based communication technologies have been used has significantly increased in the aftermath of the COVID-19 pandemic. Online conferencing system tools such as Zoom have proven particularly useful, and have facilitated a vast amount of the communication that has taken place during the pandemic (Fujisawa, 2022). Although online conferencing system tools are very useful and important, it is difficult to engage in virtual conversation that runs as smoothly as face-to-face conversation. Virtual reality (VR) technology has developed rapidly in recent years (Ademola, 2021; Faggiano & Fasanella, 2022). Consequently, the application of VR technology is no longer limited to specialized domains like gaming but has expanded to various contexts such as meetings and education (Rojas-Sánchez, Palos-Sánchez, & Folgado-Fernández, 2023). VR technology provides a highly realistic and immersive experience, allowing users to engage in conversation as if they were present in person, even though they are not in fact face-to-face. In this regard, VR technology certainly has the potential to replace online system tools. However, to date, its educational effects have not been empirically clarified in many cases.

Moral discussion has been extensively used as a teaching method worldwide, including to facilitate moral dilemma discussion (MDD). There are currently three established methods for conducting MDD: face-to-face MDD (FMDD), online MDD (OMDD), and VR moral

dilemma discussions (VRMDD), but the differences between them have yet to be explicitly clarified. Thus, the aim of this study was to compare and examine the differences between VRMDD and OMDD.

MDD (Blatt & Kohlberg, 1975) derives from Kohlberg's theory, which presents it as a teaching method for moral education. Prior to advocating for the effectiveness of MDD, Kohlberg (1971) theorized that morality has six stages of development, later contending that morality develops from Stage 1 to Stage 6 alongside cognitive development, and that MDD can be used to promote moral development (Blatt & Kohlberg, 1975). Heinz's dilemma is a key component of Kohlberg's theory. As one of the most well-known moral dilemma tasks, it is often used to facilitate MDD in moral education. In addition to Kohlberg's theory, Rest's (1979) Defining Issues Test has also been used to measure the stages of moral development (Bailey, 2011). This subsequently led to the development of the Defining Issues Test 2.

In Japan and other countries, morality develops with age in stages (e.g., Sakurai, 2011). Japanese researchers and teachers have notably collaborated, spending more than 40 years comprehensively accumulating knowledge on teaching materials that focus on moral dilemmas of interest to students, and that help to facilitate MDD that consider students' age and the educational effects of MDD (Araki, 2014). An interesting point concerning MDD is that it can encourage students to engage in free discussion by adopting moral dilemmas as teaching materials, in which multiple values conflict with each other. Although researchers have noted certain issues with MDD, in general, the conducting of MDD not only improves morality (Araki, 2014; Blatt & Kohlberg, 1975; Lind, 2019) and business ethics (Oser & Schlafli, 2010), but it also influences prosocial behavior formation (Salvador, 2019) while activating thinking and deliberating skills (Fujisawa, 2018).

As a result of these findings, Japanese researchers have spent time studying FMDD. However, to date, there has only been one study in the Nagasaki Prefecture in which the investigator conducted OMDD by connecting a group of online morality classes in elementary schools. In one study, university students accepted online discussions but reported preferring face-to-face discussions and considered online discussions supplementary to face-to-face discussions (Tiene, 2000). Hedayati-Mehdiabadi, Huang, and Oh (2020) discovered that under supportive conditions, a group of university students experienced a fresh sense of awareness after participating in ethics education using online discussions. Cain and Smith (2009) compared OMDD and FMDD in a group of pharmacy students and found that while FMDD allowed the students to ponder the subjects under discussion more effectively, the anonymity associated with OMDD opened it to criticism while hindering constructive discussion. Bell and Liu (2015) administered the Defining Issues Test 2 before and after conducting OMDD with college students, with students' scores increasing after the discussions.

Fujisawa (2018) conducted an FMDD with pairs of acquaintances at a university and administered the Standards for Public Space (SPS; Nagafusa, Sugawara, Sasaki, Fujisawa, & Azami, 2012) and the Communication Skill (CS) scales (Ueno & Okada, 2006) both before and after the FMDD took place. The SPS scale has five subscales: egocentric, peer standards, regional standards, care for others, and public values. These subscales correspond to Kohlberg's stages of moral development (Fujisawa, Azami, Sugawara, Nagafusa, & Sasaki, 2006). After the FMDD, the egocentric and peer standards subscales' scores decreased, and those relating to care for others increased.

The CS scale has four subscales: listening and speaking, non-verbal skills, assertion, and discussion. After the FMDD, the assertion and discussion scores increased. Fujisawa (2022) conducted FMDD and OMDD with pairs of acquaintances from the same university and administered the SPS and CS scales (in Microsoft Forms) before and after each discussion. Participants recorded higher scores on the SPS public values subscale after participating in OMDD than they did after FMDD, while there were no significant differences in the CS subscale scores.

As described above, OMDD using Zoom is a convenient and important resource, especially in the context of the COVID-19 pandemic; however, this type of OMDD is not entirely natural, with metaverse companies having notably accelerated their development research using VR technology. There are currently several ways to enter virtual spaces, including VR/HMD (head-mounted display), VR/desktop, and smartphones. Among these, VR/HMDs allow users to experience 3D in a form that is closest to reality. Several companies have developed VR/HMDs, with Meta's Meta quest 2 HMD (Figure 1) being the most widely used (Matthew, 2022). VR experiences are characterized by their immersiveness and interactivity. When wearing a VR/HMD, wearers are unable to see the outside world, allowing them to fully immerse themselves in the task at hand (Lee & Qiufan, 2021). Therefore, by wearing HMD, people can conduct OMDD as smoothly as if they were together in person.

*Figure 1.*  
*Individual small laboratory with VR/HMD.*



Moral studies using VR have shown that VR technology enhances perspective-taking ability with regard to empathy (Bailenson, 2018; Herrera, Bailenson, Weisz, Ogle, & Zaki, 2018; van Loon, Bailenson, Zaki, Bostick, & Willer, 2018). This has been accomplished using the Interpersonal Reactivity Index (IRI; Davis, 1983). In another study by Francis et al. (2016), VRMDD was shown to increase pulses, which predicted that non-utilitarian judgments were being conducted. Using VR technology can promote participants to care more for others (Terbeck et al., 2021) and improve children's social skills (Kellems, Yakubova, Morris, Wheatley, & Chen, 2021). VR role-playing has also been shown to enhance the degree of "fantasy" experienced in the IRI (Davis, 1983; Fujimoto, Fujisawa, & Murota, 2023). VR role-playing is the act of wearing an avatar in a virtual space and acting out that role accordingly. It is thought that this facilitates the acquisition of another person's perspective.

The above findings support the idea that the use of VR in education positively influences morality. In this way, various effects of VR technology have been partially revealed in relation to morality. However, the effects of VR technology in the conducting of MDD, one of the most commonly used teaching methods in moral education in schools, have

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yet to be clarified. It is also unclear whether CSs are enhanced through VRMDD, which is a more realistic proposal than doing so through OMDD. If CSs are enhanced in VRMDD as compared to OMDD, VR technology will be the more promising avenue in the post-COVID-19 era, with online activities now more advanced. Therefore, Study 1 examined whether VRMDD enhanced morality and CS in a group of students. Study 2 examined whether using VR technology in MDD changed perspective-taking abilities.

## 2. STUDY 1

### 2.1. Method

*Figure 2.*

*Participant wearing VR/HMD in a small laboratory.*



*Figure 3.*

*Participants wearing avatars playing VRMDD in the virtual space MQW.*



*Figure 4.*

*Participants were divided into several people and performed VRMDD in the virtual space "ayalab classroom & park".*



The study participants were 38 female university students who were randomly assigned to the OMDD or VRMDD condition. The OMDD was conducted via Zoom using individual personal computers, with participants in the VRMDD using a VR headset (Meta Quest 2; Figures 1 and 2). Pairs 1 and 2 and the experimenter participated in separate small laboratories. In the VRMDD condition, the Meta Quest Workrooms (MQW) by Meta were used as the virtual space for conducting the VRMDD (Figure 3). The participants and experimenter wore VR/head mounted displays (VR/HMD) to enter the MQW as their avatars. The avatars moved in synchronization with the realistic body movements of the participants (e.g., blinking, neck or face orientation, and hand movements). In each experiment, the assistants who conducted this experiment alongside the study author explained to each participant how to use VR. Under both conditions, after following the experimenter's instructions and practicing for a period of time, the pairs discussed Heinz's dilemmas (1) and (2). Figure 3 shows the setup for the VRMDD condition. The discussion ended when the pairs reached a conclusion. The SPS and CS scales were administered both before and after the relevant discussions. The laboratory was ventilated, and the experimental apparatus was disinfected with alcohol. VR masks were also used to prevent the spread of infections.

The SPS scale comprises 25 items including five subscales and evaluates the standards an individual considers important concerning egocentric behavior in public spaces in the pursuit of profit or freedom, without concern for the impression it creates on others. Peer standards denote the importance of alignment with peers; regional standards represent the importance of local community approval; care for others refers to the importance of caring for unrelated individuals; and public values denote concern for the public interest and fairness to society as a whole. Fujisawa et al. (2006) confirmed the reliability and relevance of the scale. These five subscales correlate with the five stages of the Defining Issues Test (Fujisawa et al., 2006). Each item calls for a response on a five-point scale (1 = "does not describe me at all"; 5 = "describes me very well"). The total scores are calculated for each subscale, with higher corresponding subscale scores indicating a greater tendency to perform to that behavioral standard.

As noted above, the CS scale (Ueno & Okada, 2006) comprises four subscales: listening and speaking, non-verbal skills, assertion, and discussion. Listening and speaking, and non-verbal skills relate to the ways in which people directly and indirectly deliver and receive conversational input from others. Assertion is a CS that can help build better relationships by openly conveying and receiving opinions with respect for others, rather than unilaterally imposing one's own opinion or having to tolerate a conversation partner who does so. Discussion ties together the other skills that comprise communication abilities. Following the scoring manual developed by Ueno and Okada (2006), synthetic scores were calculated for each field scale.

A higher score indicated better skills in that area.

## 2.2. Results and Discussion

Tables 1 and 2 present the basic statistics relating to the SPS and CS scores. After confirming the homogeneity of both conditions, an analysis of variance (ANOVA) was conducted with two factors for each subscale: condition (OMDD and VRMDD) and time of the survey (pre-test and post-test). The results obtained revealed significant differences in the main effect of time of the survey for the SPS subscales [egocentric:  $F(1,36) = 5.5, p > .05$ , biased  $\eta^2 = .13$ ; peer standards:  $F(1,36) = 5.9, p > .05$ , biased  $\eta^2 = .14$ ]. Participants recorded significantly higher scores on the SPS egocentric and peer standards subscales in the pre-test than in the post-test. The CS subscale scores showed no significant differences.

Table 1.  
SPS subscale scores for each condition.

	Condition	Egocentric		Peer standards		Regional standards		Care for others		Public values	
		M	SD	M	SD	M	SD	M	SD	M	SD
Pre-test	OMDD	9.4	3.1	11.7	3.9	19.3	3.1	21.2	1.9	22.1	2.8
	VRMDD	9.2	2.8	12.7	4.7	20.2	4.0	21.5	3.0	22.7	1.3
Post-test	OMDD	8.7	3.0	11.4	3.3	19.6	3.6	21.2	2.2	21.9	2.8
	VRMDD	8.4	2.8	11.2	4.2	20.3	4.1	21.0	3.2	22.8	1.7

Table 2.  
CS subscale scores for each condition.

	Condition	Listening and speaking		Non-verbal		Assertion		Discussion	
		M	SD	M	SD	M	SD	M	SD
Pre-test	OMDD	1.8	0.5	1.8	0.8	13.9	1.8	4.1	0.9
	VRMDD	1.9	0.7	2.0	0.5	13.8	2.0	4.0	0.7
Post-test	OMDD	1.7	0.6	1.9	0.7	13.8	2.6	4.1	0.9
	VRMDD	1.8	0.7	2.1	0.5	13.8	2.4	4.3	0.7

The author examined whether using VRMDD improved morality, CS, and FMDD. Interestingly, the findings obtained seem to indicate that OMDD and VRMDD lowered behavioral standards with a narrow social perspective (egocentric and peer standards) but were not at all related to behavioral standards with a wider social perspective (regional standards, care for others, and public value) or to CS.

Regarding the SPS scale, the findings partially confirmed those of Fujisawa (2018). The same results for the egocentric and peer standards subscales were found in this study using OMDD and VRMDD as in the study by Fujisawa using FMDD; both subscale scores decreased after all forms of MDD, which means that those relating to narrow social perspectives (egocentric and peer standards) decreased. OMDD and VRMDD did not influence behavioral standards with wider social perspectives, such as regional standards, care for others, and public value, whereas FMDD did. These results suggest that MDD reduces narrow social perspectives (egocentric and peer standards). Therefore, it can be concluded that FMDD, OMDD, and VRMDD all reduce narrow social perspectives, meaning that any style of MDD can improve narrow perspectives (egocentric and peer standards).

Concerning the CS scale, the findings did not support those of Fujisawa (2018) with regard to FMDD. Although FMDD improved assertion and discussion in Fujisawa's study, VRMDD did not improve any of the CS subscales in this study. As CS represents one of the important forms of social skills, the author assumed that FMDD would influence CS, but that VRMDD would not. In online communication, including VR and Zoom, it can be difficult to speak in turn; many people hesitate to speak up, and it is not possible to exchange opinions

with people near us in online discussions. Therefore, the author assumed that VRMDD would not affect CS scale scores, although VRMDD is more realistic than OMDD. It is difficult for VRMDD to replace FMDD as regards CS. These results highlight the fact that VRMDD, OMDD, and FMDD have their own characteristics, and that any method can be proven effective depending on the relevant needs or social situations.

Clarifying whether VR technology or OMDD enhances morality and CS is an important objective. However, as there were a relatively small number of participants in this study, future researchers should examine the effects of VRMDD on a larger group. VR technology can notably improve perspective-taking abilities (Herrera et al. 2018). Although van Loon et al. (2018) and Herrena et al. (2018) previously stated that role-playing in VR, an established teaching method for morality classes, improves perspective-taking ability, this phenomena has been fully replicated in Japan. Therefore, Study 2 examined whether using VR technology in MDD changed perspective-taking abilities in Japan.

### 3. STUDY 2

#### 3.1. Method

Study 2 examined whether using VR technology in MDD changed participants' perspective-taking ability, and whether the results in Study 1 were replicated. Specifically, it examined whether VRMDD improved morality.

The participants were 24 female university students. Each participant entered the laboratory (Figure 1) individually, wore a Meta Quest 2 HMD (Figure 2), and performed the VRMDD with a participating pair from another laboratory. Heinz dilemmas (1) and (2) were used in the VRMDD. An assistant assisted the participants to ensure that they were wearing the experimental apparatus correctly, and the operating procedures were fully explained and confirmed before the experiment commenced. The MQW was used as the virtual space for conducting VRMDD. Both the participants and experimenter wore VR/HMDs to enter the MQW (Figure 3) as their avatars. Microsoft Forms was used to administer pre- and post-tests. Before and after the discussions, the SPS scale and the IRI (Davis, 1983) were administered. The laboratory was ventilated, and the experimental apparatus was disinfected with alcohol. VR masks were also used to prevent the spread of infections.

The IRI, created by Davis (1983), measures empathy using multiple dimensions and was translated by Sakurai (1988) into Japanese. This was the version used in this study. The IRI consists of four subscales (perspective-taking, fantasy, empathic concerns, and personal distress) comprising 28 items. Responses were rated on a four-point scale (1 point = "I don't think so"; 4 points = "I think so"). The total score for each subscale was calculated as described by Sakurai (1988).

#### 3.2. Results and Discussion

Tables 3 and 4 present the basic statistics for the IRI and SPS subscale scores. The results of the ANOVA pre- and post-VRMDD concerning the IRI and SPS subscales were examined. The results revealed significant differences in the main effect for the IRI subscales [perspective-taking:  $F(1,15) = 4.3$ ,  $p < .10$ ,  $\eta^2 = .22$ ; and personal distress:  $F(1,15) = 3.7$ ,  $p < .10$ ,  $\eta^2 = .20$ ]. The perspective-taking scores were higher on the post-test than on the pre-test. The VR perspective-taking results were similar to those obtained in previous studies (Herrera et al., 2018; van Loon et al., 2018). Contrastingly, personal distress scores were higher on the pre-test than on the post-test. The results revealed significant differences in the main effect for the SPS subscales [egocentric:  $F(1,23) = 3.8$ ,  $p < .10$ ,  $\eta^2 = .14$ ]; and peer-standard  $F(1,23) = 10.4$ ,  $p < .01$ ,  $\eta^2 = .31$ ]. The scores for the egocentric and peer standards were lower in the post-test than in the pre-test.

Table 3.  
IRI subscale scores in VRMDD.

	Perspective-taking		Fantasy		Empathic concerns		Personal distress	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pre-test	22.4	2.8	20.6	4.4	21.9	3.8	20.2	3.5
Post-test	23.7	3.4	21.3	4.2	22.1	3.5	19.0	3.7

Table 4.  
SPS subscale scores in VRMDD.

	Egocentric		Peer standard		Regional standard		Care for others		Public values	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pre-test	9.3	2.8	12.3	4.6	20	3.9	21	3.4	22.7	1.4
Post-test	8.5	2.8	10.8	4.1	20.1	4.0	20.7	3.2	22.7	1.7

#### 4. CONCLUSION

This study investigated the educational effects of VR technology, which is said to provide a more immersive and realistic feeling than other comparable online tools. To this end, MDD, which is frequently used in moral education situations, was employed. Specifically, in Study 1, two conditions were established, VRMDD and OMDD, which were compared to SPS (corresponding to stages of moral development) and CS. In Study 2, IRI was measured before and after VRMDD, and reproducibility was examined to determine whether VR perspective-taking experiences (VRPT; Herrera et al., 2018; van Loon et al., 2018) are also observed in Japan.

No significant differences were found between the conditions assessed in Study 1, suggesting that OMDD and VRMDD had similar educational effects. VRMDD is said to have a more immersive and realistic feel than OMDD. As a result, it was thought that VRMDD conditions could create a more realistic discussion scene. However, the changes observed in participants' CS in Study 1 did not suggest such an outcome. In this experiment, if the sole purpose was to facilitate a moral discussion within a virtual environment, the necessity of the virtual space may not have been as evident compared to a scenario where role-playing was an essential component performed within the virtual space. Furthermore, even in virtual space, it has been confirmed that there is a slight delay in the timing of conversation. Therefore, even if VRMDD was able to offer a more realistic conversation format than OMDD, it may not have proven as realistic as FMDD. To clarify this potential issue, it would be necessary, for example, to conduct the same conversation type using FMDD, OMDD, and VRMDD formats, and to compare the results obtained in the future.

In terms of SPS, similar to the findings on FMDD in a previous study (Fujisawa, 2018), the post-test scores indicated a decrease in narrow social perspectives (egocentric and peer-standard). These results suggest that morality can be partially improved by performing



OMDD and VRMDD, and that the methodology can have educational effects when discussing values, whether in person, online, or in VR. In the future, it is expected that the spread of the COVID-19 virus will subside, and opportunities for face-to-face discussions will subsequently increase. However, discussions about values (MDD, Philosophy Café, and so on) are expected to encompass participants with diverse values. If VR or online technologies are used, it is possible to easily create a moral discussion that brings together a diverse range of participants, and it is suggested that the participants involved may subsequently become more morally minded (in some conditions, see Fujisawa, 2022). Notably in this study, VRMDD and OMDD had no effect on a broader social perspective (consideration of others). Therefore, in the future, it will be necessary to consider not only the methods and techniques to be used during MDD, but to also consider the facilitation and teaching methods used during such discussions.

Regarding Study 2, the presence of VRPT confirmed in previous studies (Herrera et al., 2018; van Loon et al., 2018) was also confirmed in the Japanese participants of this study. Japan and many other countries in Asia provide moral education as part of the standardized national education curriculum, in which children are expected to consider the feelings and positions of others. The results of this study suggest that it is possible to improve students' perspective-taking ability by using VR technology during moral education classes. Normally, in these classes, teachers instruct students to consider the feelings of someone other than themselves. However, the results of this study suggest that it may be possible to facilitate this type of learning by having students experience the feelings of someone else in a virtual space (e.g., Fujimoto et al., 2023). Although it is too soon to draw definitive conclusions, it is likely that future teaching methods will change significantly depending on how VR technology is used in educational settings (Table 4).

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