

**The offender's empathy-taking toward the victim in Online Victim-Offender Mediation**

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### **Abstract**

In juvenile and criminal justice systems worldwide, victim-offender mediation (VOM) is one of the most accessed formal forms of restorative justice. Before the COVID-19 pandemic, VOM services worldwide were provided through direct, in-person meetings or by offline indirect forms. However, practitioners had to delay VOM programmes or consider alternate ways for parties to get in contact in the context of COVID-19. As a result, the viability and efficiency of performing VOM online are currently being discussed in Europe due to the advancement of digital communication technologies. Empathy is crucial in restorative processes such as Victim-Offender Mediation. It encompasses cognitive and affective dimensions, enabling individuals to understand and empathise with the feelings and perspectives of those involved. Cognitive empathy helps comprehend the emotions of victims and offenders, leading to a deeper understanding of their experiences. Affective empathy involves an emotional connection and shared feelings with the individuals and their stories. Studies consistently demonstrate that participating in VOM has been linked to an increase in the empathy of offenders toward the victims of their crimes. This study aims to explore to what extent online mediation might affect the offender's cognitive, affective, and total empathy taking toward the victim.

A fictitious crime scenario was presented to the participants ( $n = 34$ ), they were asked to imagine themselves in the role of the offender, and they were presented with an online VOM and a face-to-face VOM in random order. We expected offenders who attend online VOM to feel less empathic toward the victim than those who attend a face-to-face VOM. Against our expectations, there was no significant difference in the offender's cognitive, affective, and total empathy between online and face-to-face mediation, indicating no difference in a face-to-face VOM or an online VOM considering the cognitive, affective, or total empathy of the offenders toward the victims. Given that the intensity of empathy of the offender did not differ in this study, it can be suggested that practitioners may consider online communication a valuable alternative to traditional face-to-face interactions. However, further research is required to examine and resolve this approach's practical elements and potential problems. In conclusion, technology can potentially improve VOM practice, but it requires thoughtful consideration and a commitment to restorative justice ideals.

**Keywords:** Empathy, cognitive empathy, affective empathy, victim-offender mediation, restorative justice, and digitalisation

## **The offender's empathy-taking toward the victim in Online Victim-Offender Mediation**

The outbreak of the COVID-19 pandemic in early 2020 resulted in an unprecedented push toward digitalisation, especially in Europe, with many organisations forced to adopt new information technology systems or rethink their entire business models (Carroll & Conboy, 2020; Surva, 2022). This shift was necessary to enable remote work and ensure business continuity amidst the disruptions of the pandemic. As a result, digital transformation has become a critical strategy for organisations seeking to remain competitive and resilient in the post-pandemic era. Carroll & Conboy (2020) state that these new technology-driven practices will now become part of "the new normal", which is why organisations must adopt these new practices and the use of technology to make them routine in order to achieve their objectives. Digital transformation impacts individuals in practically every aspect of life through new communication technologies and business structures (Bonensteffen et al., 2022; *Mabat – Die Digitale Transformation Der Freien Wohlfahrt*, 2019).

Organisations and agencies that establish restorative justice are likewise impacted by this transformation leading to significant consequences for the criminal justice system (McGarrell et al., 2020). Restorative justice is a method of approaching a crime as a complementary or alternative response to the formal criminal justice system that involves the affected parties actively in repairing harm (Saulnier & Sivasubramaniam, 2015; Surva, 2022). Restorative justice puts the need of victims and offenders before punishing the offenders, encouraging them to take responsibility while making an effort to resolve the harm that has been done (Jonas et al., 2022; Saulnier & Sivasubramaniam, 2015). To accomplish these objectives, productive communication between the parties is crucial (Bouffard et al., 2017; Jonas et al., 2022; Hansen & Umbreit, 2018; Meléndez, 2021). Restorative justice is based on principles that recognise people's interconnectedness and shared human values, their capacity to learn from mistakes, their inner strengths, their desire for peace, and the importance of speaking and acknowledging truths and having constructive interactions (Hansen & Umbreit, 2018; Kaul, 2019; Meléndez, 2021).

In juvenile and criminal justice systems worldwide, victim-offender mediation (VOM) is the formal restorative justice practice most frequently applied and thoroughly studied (Hansen & Umbreit, 2018; Umbreit & Armour, 2011). Commonly, the majority of VOM services worldwide were provided through direct, in-person meetings or by offline indirect forms like letter exchanges and shuttle mediation, in which a third party conveys the parties' messages (Bonensteffen et al., 2022; Choi & Severson, 2009; Hansen & Umbreit, 2018). However, due

to the restrictions, practitioners were asked to delay VOM programmes or think of alternate ways to establish VOM due to the COVID-19 epidemic (Surva, 2022).

As a result, the viability and efficiency of performing VOM online are currently being discussed in Europe due to the advancement of digital communication technologies. The decision to offer online mediation for specific circumstances should be based on a careful analysis of the individual circumstances as well as the requirements and preferences of the participants. While there are reasons against online mediation, Millington and Watson (2020) provide examples of when it has been useful. Some participants, particularly young individuals, reported greater involvement and comfort when using video conferencing or telephone. In a specific case example, a restorative conference on Zoom between the young person, already familiar with the online platform could express themselves more effectively (Millington & Watson, 2020). The practitioner acknowledged that if the harmed individuals were physically present, the young person would not have been able to express themselves likewise. This instance demonstrates how online mediation may be tailored to unique situations, especially when participants are familiar with and comfortable using online communication technologies.

Surva (2022) investigated the application and immediate effects of online restorative practices across several European countries. While digital mediations provide many opportunities for communicating with physically distant others, they might suffer from limitations in transferring information (Surva, 2022). These limitations arise from the reduced opportunities for nonverbal symbolic gestures, which are crucial for conveying emotional expressions and are essential to communication (Surva, 2022). Much of the facilitation is based on body language, meaningful silence, and eye contact, which are difficult in a digital setting (Chapman & Chapman, 2016; Surva, 2022). For example, a moment of meaningful silence experienced during a session may not necessarily be attributed to a participant purposefully choosing to remain silent. Instead, it could result from temporary internet connection issues or disruptions rather than a conscious act of introspection or reflection. The study by Surva (2022) shows that online restorative justice is prone to communication breakdown due to technical risks and limited online opportunities for nonverbal symbolic gestures. This sensitivity to communication breakdown and inability to communicate through nonverbal symbolic gestures, for example shaking hands, has also been highlighted in prior studies on digitalisation (Carter & Asencio, 2019; Sumathipala, 2020; Surva, 2022). In other words, developing and maintaining the conditions of active participation and a trustful and safe environment in a digital context might be a challenge that practitioners who would like to offer online VOM need to consider, since active and voluntary involvement, as well as a trusting and safe environment, are critical

for a constrictive mediation meeting (Bolitho, 2017; Chapman & Törzs, 2018). While some practitioners claim that online VOM could expand accessibility and lower expenses (Gelderman et al., 2011; Madsen & Kræmmergaard, 2016; Surva, 2022; Taherdoost, 2018), others raise worries about the potential lack of empathy and the impact on the quality of the mediation process (Bolitho, 2017; Surva, 2022).

### **The Role of Empathy Taking in VOM**

Empathy is a mental response to others influenced by inherent abilities and the current environment (Cuff et al., 2014). It involves understanding and perceiving others' emotions through our own experiences and imagining the sensations of others. It is essential to point out that empathy does not imply projecting our own emotions onto another but acknowledging that their emotions are separate from ours (Cuff et al., 2014). Importantly, the authors make a distinction between cognitive and affective empathy (Cuff et al., 2014). Cognitive empathy is the ability to understand the feelings of another person (Blair, 2005; Cuff et al., 2014). Affective empathy involves dealing with the emotional experience produced by an emotional stimulus (Cuff et al., 2014). People can empathise generally more when they understand the subjective experience and environment of another person (Shin, 2018).

Research shows that increased empathy is one of the most important effects on offenders engaging in VOM. That is, participating in VOM has been linked to an increase in the empathy of offenders toward the victims of their crimes since offenders gain more knowledge of how their actions affected their victims (Hansen & Umbreit, 2018; Meléndez, 2021). This is because offenders directly engage in the mediation process, in which they are given a chance to hear first-hand about the harm they did and the feelings and experiences of their victims (Hansen & Umbreit, 2018; Meléndez, 2021). Shared empathy with the victim can result in better accountability and responsibility (Bouffard et al., 2017; Jonas et al., 2022; Hansen & Umbreit, 2018; Meléndez, 2021).

Considering the potential application of online mediation in the future, the question arises if or how face-to-face and online mediation differ in their capacity to evoke empathy of the offender. In particular, as online communication is commonly regarded as a valuable addition to traditional communication, in the context of VOM, its application requires critical attention: Since VOM often deals with emotionally intense encounters, the application of online tools requires careful preparation and examination. Consequently, this study aims to contribute to the question of to what extent choosing to participate in online VOM instead of a face-to-face VOM affects the offender's empathy toward the victim. The following research question has been formulated: How does the type of VOM influence the offender's empathy toward the victim?

### **Challenges of Online VOM in Developing Empathy**

In the context of VOM, empathy plays a critical role in facilitating the change-making effects of the mediation process. It can be expressed in various ways, encompassing cognitive and affective dimensions. Cognitive empathy enables individuals to understand and comprehend the feelings and viewpoints of those participating in the restorative process. It includes comprehending the feelings and experiences of victims and offenders, allowing for a more complete understanding of their emotional states. On the other hand, affective empathy refers to the emotional reaction generated by other people's feelings. It implies a shared emotional connection and empathy with the victims, offenders, and their stories. Research has consistently shown that participation in VOM leads to an increase in offenders' empathy toward their victims (Hansen & Umbreit, 2018; Meléndez, 2021).

However, concerning the potential use of online mediation in the future, it is important to critically examine the differences between face-to-face and online mediation in terms of empathy. The potential impact of online VOM on empathy remains a key research subject in restorative justice. Despite the increasing interest in online VOM, there is still a lack of research on the subject. Online communication tools can limit nonverbal cues and compromise the emotional intensity of the interaction, potentially limiting the offender's ability to empathise with the victim entirely. Nonverbal signals, including facial expressions, body language, and tone of voice, are important in transmitting emotions and building empathy (Surva, 2022). These cues are more available in face-to-face conversations and can significantly influence the emotional intensity of the contact (Swaab et al., 2011). Online communication tools, like video calls may limit the visibility and accuracy of nonverbal signs, perhaps presenting a barrier to adequately feeling and comprehending the emotions of others.

The lack of a physical presence and direct emotional connection raises the question of whether online VOM can achieve the same increase in empathy as face-to-face mediation. Online communication tools are often seen as a valuable complement to traditional communication, but their use in VOM must be carefully considered due to the emotional intensity of mediation. Therefore, this study aims to investigate the capacity of online VOM to evoke empathy in offenders and compare it to face-to-face VOM. Understanding these differences is essential for ensuring the effectiveness and ethical implementation of online VOM in restorative justice practices. Therefore, the following hypotheses were formulated:

H1: Offenders who attend online victim-offender mediation feel less empathy toward the victim than offenders who attend a face-to-face victim-offender mediation.

H2: Offenders who attend online victim-offender mediation feel less cognitive empathic toward the victim than offenders who attend a face-to-face victim-offender mediation.

H3: Offenders who attend online victim-offender mediation feel less affective empathic toward the victim than offenders who attend a face-to-face victim-offender mediation.

This study contributes to the field of restorative justice by addressing a research gap and investigating the potential impact of online VOM on empathy. The findings can be used to improve the design and execution of online mediation programmes, allowing them to encourage empathy. Finally, this study aims to understand better the potential involvement of online VOM in restorative justice practices.

## Methods

### Design

This study used a quantitative method with a 2x2 mixed factors design (between-subject: offender vs victim, and within-subject design: online mediation vs face-to-face mediation). It was conducted as an online survey in a broader, collaborative project with other Bachelor students. Within the collaborative project, the perspectives of victims and offenders were investigated by asking the participants to put themselves in the respective position. However, this study exclusively focuses on the offenders. The Independent variable was online mediation and face-to-face mediation. The dependent variable was empathy talking of the offender towards the victim, divided into cognitive empathy and affective empathy.

### Participants

The survey was completed by 224 people. The informed consent form was not signed by 3 (1.34%) of the initial participants who opened the survey, resulting in their exclusion. Due to not meeting the inclusion requirements because they were under the age of 18, 4 (1.79%) participants had to be excluded. Participants who belonged to the victim's group 92 (41.07%) were also eliminated as this study focuses on the offenders, as were those who did not complete the survey 91 (40.63%). All participants were recruited by asking family and friends personally or via social media, PollPool, a website where psychology students can upload surveys to reach participants, and SONA, the internal participant recruitment site of the University of Twente community, where students can gain credits for participating, social media, and word of mouth. The final group of 34 participants consisted of 8 males aged 20 – 36 ( $M = 25$ ;  $SD = 4.72$ ) and 26 females, with ages ranging from 20 – 55 ( $M = 26.36$ ;  $SD = 10.39$ ). The majority of participants were students (29, 85.29%), had secondary education (17, 50%), and were of German nationality (22, 64.71%). Table 1 shows further participant information regarding

frequency. The University of Twente BMS ethical review of the domain humanities and social sciences has ethically approved the survey.

**Table 1**

*Frequencies of Demographics*

Variable	Label	Frequency	Percentages
Gender	Female	26	76.47%
	Male	8	23.53%
Age	19 – 30	29	85.29%
	31 – 60	5	14.71%
Nationality	Germany	22	64.71%
	Mexico	3	8.82%
	Netherlands	2	5.88%
	Other	7	20.59%
Education	Primary Education	1	2.94%
	Secondary Education	17	50 %
	Bachelor's Degree	11	32.35%
	Master's Degree	2	5.88%
	Other	3	8.82%
Employment	Employed	4	11.76%
	Student	29	85.29%
	Other	1	2.7 %

## Materials

### *Victim offender mediation*

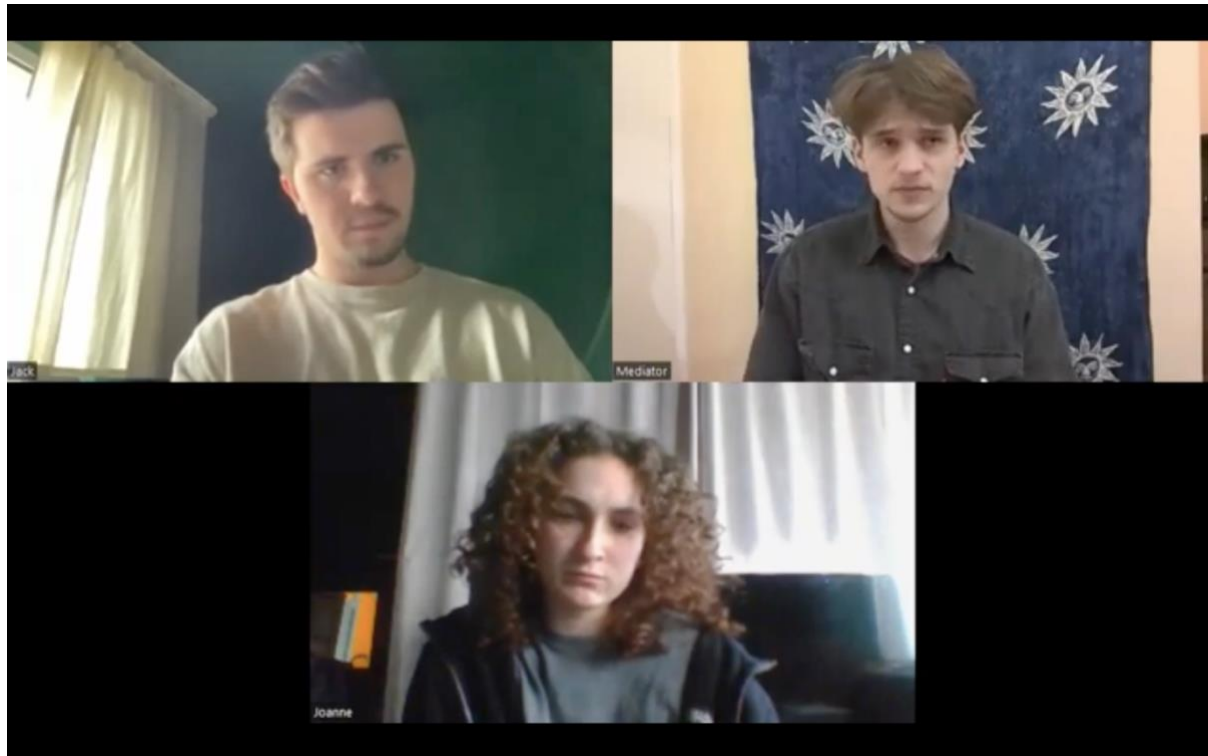
The victim-offender mediation videos were filmed by one of the researchers and actors. There were two videos in total, one was showing an online VOM using Zoom, and the other was showing a face-to-face VOM (see Figures 1 and 2). The actors were the same and dressed the same in both videos to avoid bias. In both videos, Jack, a stay-at-home parent, and Joanne, a former drug addict (Heroin) who broke into Jack's house, are talking to each other in victim-offender mediation. Additionally, there was a mediator present who was leading the conversation. During the mediation session, Joanne confesses to breaking into Jack's house and stealing jewellery to support her drug habit. Jack shares the emotional devastation caused by the loss of sentimental items. Joanne sincerely apologises and acknowledges the irreversible consequences. While Jack acknowledges the apology, he emphasises that the damage cannot



be undone. Joanne expresses her determination to make positive changes in her life. A detailed script of the videos can be found in Appendix A.

**Figure 1**

*Online victim-offender mediation*



**Figure 2**

*Face-to-face victim-offender mediation*



## **Empathy**

The *Victim Empathy Response Assessment* (VERA; Young et al., 2008) was completed by participants to assess how much empathy they felt for the victim (i.e., victim empathy; see Appendix B). *VERA* assesses cognitive and affective empathy in various crime settings, including sexual assault, car accidents, etc. *VERA* is divided into two subscales. The first subscale is concerned with affective empathy, whereas the second is concerned with cognitive empathy. The respondent's ratings of their own feelings provide a measure of affective empathy, while their ratings of how they believed the victim felt provide a measure of cognitive empathy. Participants were required to identify their feelings when viewing or reading the vignettes based on the 13 emotions, for example, "Rate how much you felt sorry while witnessing the crime." While the second subscale asks participants to assess the same items, it focuses on how the participants assume the victim of the crime felt, for example, "Rate how much you think the victim of the crime felt sorry." As a result, *VERA* has a total of 26 questions that participants have to respond to on a five-point Likert scale (1 = "not at all" to 5 = "very much so").

Furthermore, two-factor analyses for cognitive and affective empathy were conducted to assess the validity of the *VERA* scale in this research design. The *VERA cognitive empathy* indicated one underlying factor with an eigenvalue of 3.84. The factor accounted for 30% of the variance. The mean item complexity was 1, supporting that one factor is sufficient. The factor analysis showed that the variables *Happy* ( $\lambda = -0.23$ ) and *Excited* ( $\lambda = -0.16$ ) had negative factor loadings. In further analyses, these variables will be reversed. The factor loadings for the *VERA cognitive empathy* items ranged from  $\lambda = 0.09$  to 0.93, indicating moderate to high associations, with the underlying factor with the highest being comparable to the previous validity check. The *VERA affective empathy* indicated one underlying factor with an eigenvalue of 2.53. The factor accounted for 19% of the variance. Similar to the cognitive dimension, the mean item complexity was 1, supporting that one factor is sufficient. The factor loadings for the *VERA affective empathy* items ranged from  $\lambda = 0.19$  to 0.61, reflecting moderate associations with the underlying factor, being weaker than the previous validity check.

Moreover, Cronbach's alpha was used to assess the reliability of the *VERA cognitive empathy scale*, and the results showed a coefficient of 0.76. Cronbach's alpha was also calculated for the *VERA affective empathy scale* to evaluate its reliability and the results showed a coefficient of 0.7.

## **Procedure**

Through volunteer sampling, participants were recruited for the study after it was publicised on Sona, a University of Twente internal website. There, students can sign up to participate in research projects conducted by the institution. Following the participants' informed consent, they were randomly allocated to either the offender or victim condition. Participants in the offender condition were presented with a written script of a crime from an offender's point of view. At the same time, people assigned to the victim's were presented with the same written script of a crime from a victim point of view. The participants in different conditions were asked different questions. The participants in the offender condition first filled in a questionnaire about their cooperation towards the victim, followed by *State Shame and Guilt Scale (SSGS)*, and lastly, about their willingness to participate in a VOM. The participants in the victim condition first filled in a questionnaire about their cooperation towards the offender, followed by a questionnaire about punishment, and lastly, about their willingness to participate.

Afterwards, all participants watched identical videos of an online VOM and a face-to-face VOM randomly assigned which one they were presented first. After each condition, the participants in the offender condition first filled in a questionnaire about the outcome satisfaction, then about the cooperation towards the victim, and lastly, the *VERA*. Participants in the victim condition first filled in after each condition a questionnaire about the outcome satisfaction, then about the cooperation towards the offender, and lastly about their willingness to participate. After completing these, the participants were required to answer questions regarding their experiences during this study, whether they or one of their relatives and/or friends ever committed a crime or was a victim. Further, the participants answered a few control questions like "To what extent could you empathize with the scenario you read in the beginning?", "To what extent could you imagine being the victim / offender?" and "To what extent did you answer the questions seriously?". Lastly, participants were given a debrief after completing all the questionnaires. The survey took the participants 20-30 minutes to complete and can be seen in Appendix C. To better understand the survey flow, consider Appendix D. Since this was a collaboration project, not all of the questions the participants were asked in the survey were relevant to this study, which is why only the relevant questionnaires were discussed in the materials.

### **Data Analysis**

The software RStudio 2023.03.0+386 was used to analyse the collected data. The script for the analysis may be found in Appendix M. It made use of the packages *readr* (Wickham & Hester,

2020), tidyverse (Wickham et al., 2019), psych (Revelle, 2023), and dplyr (Wickham et al., 2022).

The first stage in the analysis was to clean the dataset. Later, all frequencies, means, and standard deviations of the variables were calculated. The next step was to run a factor analysis to check the validity and assess Cronbach's alpha to check reliability. After that, a paired t-test was conducted to compare the means of the different independent variables of VOM style (online and face-to-face) with the empathy scores.

## Results

### Descriptive Statistics

According to the control questionnaire, the majority of the participants were able to relate to the situation in a neutral (12, 35.29%) to moderate level (17, 50%) (see table 2). Results show that the total empathy (including cognitive and affective empathy) was only slightly lower in the online ( $M = 2.87$ ,  $SD = 1.43$ ) condition compared to the Face-to-face condition ( $M = 2.93$ ,  $SD = 1.46$ ), both were close to the midpoint of the five-point Likert scale (see table 3). A correlation analysis was performed to investigate the relationships between age, gender, control variables, total empathy, cognitive empathy, and affective empathy (see table 3). The table shows that the correlation between cognitive empathy and total empathy is statistically significant at the  $p < 0.01$  level, indicated by the value of ( $r = 0.93$ ). The correlation between affective empathy and total empathy is likewise significant at the  $p < 0.01$  level, indicated by the value of ( $r = 0.92$ ). Moreover, the correlation between cognitive empathy and affective empathy is statistically significant at the  $p < 0.05$  level, indicated by the value of ( $r = 0.72$ ).

**Table 2**

*Frequencies of Control questions*

Variable	Mean group	Frequency	Percentages
Control questions	NA	1	2.7%
	Not at all	0	0%
	Slightly	2	5.88%
	Neutral	12	35.29%
	Moderately	17	50%
	Very much so	2	5.88%

**Table 3**

*Correlation table including the means and the correlations of age, gender, total empathy, cognitive empathy, and affective empathy. Total empathy, cognitive empathy, and affective empathy were measured on a five-point Likert scale (1 = "not at all" to 5 = "very much so").*

Measure	M	SD	Age	Gender	Total empathy	Cognitive empathy	Affective empathy
Age	26.03	9.29	-				
Gender	-	0.43	0.09	-			
Total empathy	2.89	0.47	0.06	0.17	-		
Online	2.87	1.43					
Face-to-face	2.93	1.46					
Cognitive empathy	2.81	0.54	0.103	0.23	<b>0.93**</b>	-	
Online	2.77	1.36					
Face-to-face	2.88	1.39					
Affective empathy	2.98	0.49	0.009	0.09	<b>0.92**</b>	<b>0.72*</b>	-
Online	2.97	1.48					
Face-to-face	2.97	1.52					

Note \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

### Testing the hypotheses

A linear model using paired t-tests examined differences between online and face-to-face mediation groups on cognitive and affective and total empathy. The mean values for online cognitive empathy ( $M = 2.77$ ,  $SD = 1.36$ ) and face-to-face cognitive empathy ( $M = 2.88$ ,  $SD = 1.399$ ) did not differ significantly,  $t(34) = -0.7$ ,  $p = 0.49$ , 95%  $CI [-0.22, 0.11]$ . Likewise, there was no significant difference between the mean values of online affective empathy ( $M = 2.97$ ,  $SD = 1.48$ ) and face-to-face affective empathy ( $M = 2.97$ ,  $SD = 1.52$ ),  $t(33) = -0.41$ ,  $p = 0.68$ , 95%  $CI [-0.19, 0.12]$ . Additionally, the mean values of overall online empathy ( $M = 2.87$ ,  $SD = 1.43$ ) and face-to-face empathy ( $M = 2.93$ ,  $SD = 1.46$ ) did not significantly differ,  $t(33) = -0.79$ ,  $p = 0.43$ , 95%  $CI [-0.18, 0.08]$ .

### Discussion

With the outbreak of Covid-19, we faced an extraordinary situation, which resulted in the need for digitalisation in many societal domains. In restorative justice systems, many victim-offender mediations had to be postponed, or online alternatives had to be considered. Now, even beyond Covid-19, online sessions might be a valuable alternative to face-to-face VOM, particularly in exceptional situations, for example, if the offender and the victim are not in the same country or other reasons prevent victims and offenders from face-to-face participation. Participating in VOM has been linked to an increase in the empathy of offenders toward the victims of their crimes (Hansen & Umbreit, 2018; Meléndez, 2021). When offenders can take the victim's perspective and experience feelings of empathy, it can lead to the

development of pro-social behaviours. Therefore, focusing on empathy within the VOM framework contributes to the offender's sense of accountability and responsibility for their actions, potentially reducing the likelihood of reoffending (Dijk et al., 2020). As a result, by paying attention to empathy in the context of VOM, this study hopes to provide a further understanding of its function in fostering suitable behavioural adjustments and decreasing the likelihood of future criminal behaviour.

The purpose of this study is to see if the type of VOM has an impact on the empathy of the offender towards the victim. To make a direct comparison, face-to-face VOM was examined in direct relation to online VOM. Overall empathy, as well as cognitive and affective empathy, were examined in the study. It was ensured that the validity and reliability of the survey were also maintained in this study. Against expectations, no statistical significance was found as to whether the total empathy, cognitive empathy, or affective empathy of the offenders towards the victims is higher in a face-to-face VOM than in an online VOM. Therefore, the hypothesis that offenders who attend online victim-offender mediation feel less empathic toward the victim than offenders who attend a face-to-face victim-offender mediation needs to be rejected, as well as the hypothesis that offenders who attend online victim-offender mediation feel less cognitively empathic toward the victim than offenders who attend a face-to-face victim-offender mediation and that offenders who attend online victim-offender mediation feel less affective empathic toward the victim than offenders who attend a face-to-face victim-offender mediation.

According to Rhoads (2010), general face-to-face interactions are commonly associated with higher levels of satisfaction, suggesting that face-to-face VOM might be expected to stimulate greater empathy from offenders. The current study's finding challenges this expectation by demonstrating that online VOM can be equally effective in evoking empathy. Further, according to the communication orientation model proposed by Swaab et al. (2012), face-to-face meetings are generally considered the most comprehensive and rich form of communication, offering high levels of non-verbal cues. In contrast, nonverbal indicators may be lacking in communication methods such as video chat, phone calls, or letter exchanges, thereby restricting the capacity to understand and empathise with others effectively. It implies that face-to-face interactions are expected to elicit a higher level of empathy in individuals compared to other communication methods such as video chat, phone calls, or letter exchanges.

Contrary to this expectation, the study by Bonensteffen et al. (2021) shows that online and face-to-face meetings can elicit empathy taking in the offender, which is usually associated with richer forms of communication. Additionally, Rhoads (2010) remarks that perceptions and

attitudes towards technology could change over time and that confidence in virtual collaboration can be created through mindful methods. Furthermore, Millington and Watson's (2020) findings imply that online Restorative Justice has the potential to be beneficial in situations where face-to-face contact is not possible. It supports the notion that online VOM has the potential to be a viable alternative, as it allows for more people to be involved in the restorative process. The study acknowledges the role of technology in facilitating Restorative Justice practises, notably video conferencing. These findings are consistent with the current study's finding that there is no significant difference in empathy between face-to-face VOM and online VOM, implying that online VOM can effectively facilitate Restorative Justice processes. They also acknowledge that online VOM may only be appropriate for specific instances, especially those that are complex and sensitive. Thus, the study and the literature highlight the possible advantages and considerations associated with online VOM, reinforcing that it can be a practical and suitable approach in certain contexts.

### **Limitations and strengths**

This study is not without limitations. First, methodological limitations need to be addressed. The small number of participants is the project's primary concern. Unfortunately, due to the study's short duration, only a small number of participants were recruited, making it difficult to claim generalisability. As a result, follow-up research should consider a bigger sample size, as expressed by Cohen (1992), "to detect a medium difference between two independent sample means ... requires  $N = 64$  in each group" (p.158).

In addition, after talking to many participants, it was communicated to us that the study as a whole took quite a long time and was complicated for someone unfamiliar with the subject (Kost & Da Rosa, 2018). In addition, most of the participants conducted the study in a foreign language, which led to more effort, complications, and intense concentration, which could lead to incorrect answers when conducting a more comprehensive study in front of a laptop without being able to ask questions (Squires, 2009). Based on this, it could be suggested that for a replication study, simplifying the study processes along with providing more straightforward instructions could avoid any difficulties and provide an easier process for participants. It is additionally beneficial to provide participants with the choice of completing the research in their native language or having access to translation support if necessary. Finally, combining quantitative measurements with qualitative data approaches, such as interviews, can give a more thorough insight into participants' experiences.

However, several methodological strategies were used in the study to ensure standardisation and to reduce potential biases. A standardised online survey format was used to

collect data from participants. The study ensured consistency in the delivery of questions and response options by using an online survey, allowing for standardised data collection across all participants. Furthermore, specific measures were taken in the creation of the videos used in the study to minimise potential biases. The videos were carefully created to be as similar as possible, with factors such as clothing, people, and other visual elements remaining consistent.

### **Implications for future practice**

The study's findings have significant value for restorative justice and VOM practitioners. Practitioners may consider online communication a helpful alternative to traditional face-to-face interactions since the intensity of empathy of the offender does not differ. Geographic distance and logistical constraints can be overcome by online mediation, making it more accessible and convenient for participants. It can potentially enhance VOM participation rates, particularly among those uncertain or incapable of attending in-person sessions. Furthermore, those who find face-to-face encounters overly confrontational may find the apparent safety of online contact appealing (Bonensteffen, 2021). By using online VOM, practitioners have the opportunity to reach a broader range of people and encourage the digitisation process of the restorative justice system.

It is important to consider the complexity of VOM/ Restorative Justice. Restorative justice prioritises the need of the persons involved before punishing the offenders, encouraging them to take responsibility while working to repair the damage done (Jonas et al., 2022; Saulnier & Sivasubramaniam, 2015). To achieve these goals, productive communication between the parties is essential to many participants. Therefore, it is of great importance to ensure that this communication is also productive in each format of the VOM (Bouffard et al., 2017; Jonas et al., 2022; Hansen & Umbreit, 2018; Meléndez, 2021). While the current study's findings suggest that online VOM can be a valid alternative in fostering empathy in the offender toward the victim, it is essential to explore and consider all potential differences and aspects of this adaptation to ensure its effectiveness and ethical implementation in practice.

Further, facial emotion processing is widely acknowledged as an important element of daily living (Chaby et al., 2017). Nonverbal communication requires facial emotion processing and the capacity to appropriately read emotions from facial expressions (Chaby et al., 2017). Facial expressions play an important role in transmitting emotions, and individuals are competent at interpreting emotions through facial signals, particularly in the upper face area, which includes the eyes and eyebrows (Bonensteffen et al., 2020). Hence, participants in both face-to-face and online meetings may have been able to successfully identify and understand emotional cues based on the visual information provided. As a result, even in online meetings,



when visual signals are restricted, participants may be able to recognise and interpret emotions through visible facial expressions, providing a comparable level of empathy between online and face-to-face VOM. However, it is essential to note that the presence of visual cues and their impact on empathy should be further examined and clarified in the context of online VOM.

According to Swaab et al. (2012) computer-mediated communication does not carry social cues at the same speed as face-to-face conversation (Swaab et al., 2012). It implied that computer-mediated communication, such as online meetings, may initially experience difficulty communicating social cues and forming meaningful relationships due to the lack of visual contact, audible contact, and synchrony. However, Swaab et al. (2012) emphasise that individuals can adjust to these constraints over time and effectively form meaningful interpersonal connections, implying that participants in online meetings may have overcome initial obstacles and developed a degree of empathy that matches face-to-face VOM. Furthermore, participants may have already been involved in online communication due to the COVID-19 pandemic, which may have aided their adaptation to online interactions and possibly influenced their ability to establish meaningful connections and exhibit similar levels of empathy in online VOM. This ability could be a possible moderator, which should be further investigated in future research.

Additionally, we suggest re-enacting the VOM situations. In this study, face-to-face VOM and online VOM were displayed as a video. This could have resulted in an insufficient effect of the difference between a real conversation and an online conversation, and both situations could have had a similar influence on the participants. Moreover, the participants were not involved in the conversation of any VOM, which could have made empathy differences less likely to be perceived. While most participants could empathise neutrally to moderately with the scenario, re-enacting the VOM could reinforce this even more.

However, when adopting online VOM, practitioners must consider several factors. For example, making eye contact with the other party is not possible, which might imply that anything expressed, such as an apology, might feel dishonest (Millington & Watson, 2020). Further investigation is needed to examine and resolve this approach's practical elements and potential problems. It involves ensuring that mediators have enough training for effectively leading online mediation sessions and that they appreciate the benefits and value of this format. Convincing stakeholders, including offenders and victims, of the use and effectiveness of online VOM may also be an essential task. Furthermore, ethical and security considerations should be carefully evaluated, and suitable procedures should be established to ensure the confidentiality and safety of digital participants. By identifying these consequences and actively working to

resolve them, practitioners may maximise the potential of online VOM and contribute to the growth of restorative justice practices.

### **Conclusion**

In conclusion, technology can potentially improve VOM practice, but it needs thoughtful consideration and commitment to restorative justice ideals. According to Freitas and Palermo (2016), while selecting online platforms or similar tools, the protection and adherence to the essential principles of restorative justice should be prioritised throughout the whole design and implementation process. Technology has the ability to develop new restorative environments and procedures, consequently improving accessibility and involvement, but it must adhere to the essential values and concepts that motivate VOM. Restorative justice's ethical and moral foundations should govern technology's use, ensuring it facilitates transformational and healing processes, encouraging empathy, accountability, and meaningful conversation between victims and offenders. The current study shows that online forms of communication, such as online VOM, can contribute to core aspects of restorative justice, including increased empathy of offenders towards their victims. We may utilise the potential of technology to improve the field of VOM and contribute to more inclusive and successful restorative practices by incorporating it ethically and in accordance with restorative justice ideals.

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## Appendix

### Appendix A

#### *Script of the Videos*

Mediator:

“We are here to discuss the burglary, which took place on the 24<sup>th</sup> of March at the house of Jack.”

“Now, this meeting is not to decide whether Joanne is a good or a bad person. It is to focus about what she has done, and how her behaviour has affected you.”

“Hopefully, through this process, we can all help to heal the harm that has been caused by the burglary.”

“Joanne, would you like to tell Jack what happened?”

Joanne:

*(Looks at the ground before talking)*

“Uhm, on the 23<sup>rd</sup> of March, I broke into your house”.

“Uhm, I just gotten through a window, knocked on the door to check if anybody was in”.

*(Deep breath)*

“I can’t remember a lot about it *(deep exhale)*, but I remember going in and taking a jewellery box (...) and I remember putting it into a carrier bag.”

*(Not knowing what to say, looking to the mediator)*

Mediator:

*(Professional, making notes during the conversation)*

“What were you thinking about at the time, Joanne?”

Joanne:

*(Thinking intensively)*

“Just thinking about to get some money to fund my drug habit. Just wanted to get in and out there quick. Just ... I don’t know.”

Mediator:

*(Looking to Jack)*

“Do you want to talk about how this has been for you?”

Jack:

“For me the hardest part was that you took my jewellery.”

*(Shaking her head, using hand while talking)*

“You didn’t take things that had no emotional value in my house, like the laptops and cameras. You took **all** my jewellery (*getting emotional*), some of it (*sobbing, slightly crying*) things my family have gifted me. These are gone and are irreplaceable. My children and I were gone half an hour when you were in my house, so I was devastated. Absolutely devastated.”

Joanne:

“I’m sorry.”

“I know what I say can’t really replace any of the things I stole. I just want to apologize. I didn’t ever think about the consequences.”

Jack:

“I think that’s the problem.”

Joanne:

“Yeah.”

Jack:

“You know, your actions have affected me and my family a lot.”

Joanne:

“I do actually think that the time in prison has really helped me to sort myself out. I’m really sorry. If I could replace any of the jewellery, (*stumbling*) I would.”

Jack:

(*abruptly*)

“But you can’t.”

(*Small pause*)

Mediator:

“What would make things better for you personally? What would you like to come out of today’s meeting?”

Jack:

“Well, I suppose I’ve had it. Joanne has apologized. She can’t make up for what she did, I know that, but you have apologized. I won’t give up of what I have lost, but I think...

(*Small pause*)

Yeah, I think she understands.”

Joanne:

“I do.”

Mediator:



“Joanne, can you see that the choices that you made have caused harm?”

Joanne:

“Yeah, I do. Yeah, definitely. I just want to get my life back on track and just want to apologize once again for doing what I did.”

**Appendix B*****Victim Empathy Response Assessment (VERA)***

Please rate how much you felt the following emotions while participating in the victim-offender mediation from a scale of 1 = "Not at all" to 5 = "Very much so".

1. Worried
2. Sad
3. Upset inside
4. Distressed
5. Sorry
6. Disturbed
7. Angry
8. Disgusted
9. Frightened
10. Thrilled
11. Interested
12. Happy
13. Excited

Please rate how much you think the victim felt the following emotions while participating in the victim-offender mediation from a scale of 1 = "Not at all" to 5 = "Very much so".

1. Worried
2. Sad
3. Upset inside
4. Distressed
5. Sorry
6. Disturbed
7. Angry
8. Disgusted
9. Frightened
10. Thrilled
11. Interested
12. Happy
13. Excited

## **Appendix C**

### *The complete Survey*

#### **Informed Consent.**

### **INFORMED CONSENT**

#### **"Start the Meeting – The Effects of Victim-Offender Mediation"**

#### **Purpose**

Welcome and thank you for participating in this study which is part of my Bachelor thesis at the University of Twente. This study is about victim-offender Mediation (VOM). VOM gives victims and offenders of crimes the chance to communicate about the crime that has been committed. The goal of this study is to learn more about the effects of VOM and the likelihood of participation based on different factors of the individual.

#### **Procedure**

In the following study, you are going to be presented with several questions and a video of a victim-offender mediation session. The participation will take approximately 20 minutes and your participation is voluntary. If there are questions that you feel are too sensitive or you feel uncomfortable answering, you do not have to do so. There are no consequences for refusing to answer or withdrawing from the study at any time. If you would like to withdraw from the study after your responses have already been recorded, feel free to contact the researcher within 10 days after participation.

The study is going to contain some sensitive topics that may be distressing for some participants. There is going to be mentioning of the topic of crime and offences as well as issues about the punishment of offenders. Individuals that were involved in a crime, either as a victim or an offender may find the following study distressing.

#### **Confidentiality**

The conduction of this study, collection of responses and analysis of the data is only going to be used for educational purposes. The data given will be handled anonymously and stored on the personal devices of the researchers. The data will be deleted one year after the conduction of the study.

## **Participant Rights**

Your participation is voluntary. You may choose not to take part in the study or to stop participating at any time, for any reason, without any consequences. You will receive the full compensation also if you stop participating. To withdraw participation at a later time, please inform the principal investigator via email within 10 days of your participation.

If you have questions about your rights as a research participant, wish to obtain information, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee, [ethicscommittee-bms@utwente.nl](mailto:ethicscommittee-bms@utwente.nl).

For further information about this study, contact one of the investigators:

Alex Schapowal: [a.schapowal@student.utwente.nl](mailto:a.schapowal@student.utwente.nl)

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The supervisor of this study is: [f.bonensteffen@utwente.nl](mailto:f.bonensteffen@utwente.nl)

The study advisors: [studyadvisor-psy@utwente.nl](mailto:studyadvisor-psy@utwente.nl)

## **Consent and Authorization Provisions for “Start the Meeting – The Effects of Victim-Offender Mediation”**

Your consent indicates that:

- I understand that any information given by me may be used in future reports, articles, publications or presentations by the researcher/s, but that my data will not be identifiable.
- I understand that anonymized data will be kept according to University guidelines for up to 10 years after the end of the study.
- I agree to take part in the study.
- I understand that my participation is voluntary and that I am free to withdraw my participation, without explaining, until 10 days after my participation.
- I confirm that I am at least 18 years old.
- I consent to participate in the following study

o Yes

o No

**Situation of the crime offender's view.**

You (Joanne) are in your mid-twenties and have been battling heroin addiction and unemployment. You have been struggling to make enough money to survive as a result of your addiction, and you have turned to illegal activities to support your habit.

Recently, you broke into a stranger's (Jack) house alone by climbing through a window with the intention of finding valuable items to sell and make some money. Your main objective was to buy more drugs with the money you made. However, your actions were unlawful and resulted in your detention by law enforcement, you were sentenced to one year in jail.

**Situation of the crime victim's view.**

You (Jack) are a stay-at-home parent in your mid-40s, and you have multiple children. You live in a beautiful, wealthy house, but unfortunately, your home was recently burglarized. The worst part was that the break-in occurred while your children and you were away attending a family funeral. When you returned home, you were shocked to find that your home had been broken into and robbed.

The thief (Joanne) has taken many valuable items, including some jewelry that was very dear to you. These pieces of jewellery had sentimental value because they reminded you of memories. Losing them was devastating, and you felt emotionally hurt that someone would take something that had so much personal meaning.

**Cooperation towards the victim.**

The following section contains items about your cooperative attitude towards the victim. Please indicate how much you relate to the statements below on a scale from 1 (Very Unrelatable) to 5 (Very Relatable) and answer them as honest and precise as possible.

1. I would actively listen to ideas and opinions of the victim during a conversation
2. When working together with the victim, I would be willing to make compromises and concessions
3. In a disagreement I would establish common ground and work towards a resolution that benefits everyone involved

4. I would express appreciation and gratitude towards the victim for their contributions and efforts
5. I would willingly help the victim with their work, even if it means sacrificing my own time and/or resources
6. When working with the victim, I communicate my thoughts and ideas well
7. I am likely to take initiative and take on additional responsibilities when working together with the victim on a task
8. I would refrain my own interests or desires for the sake of the victim
9. I perceive the victim as trustworthy
10. I believe there are two sides to an argument and try to take both views into account

#### **Cooperation Towards the offender.**

The following section contains items about your cooperative attitude towards the Offender. Please indicate how much you relate to the statements below on a scale from 1 (Very Unrelatable) to 5 (Very Relatable) and answer them as honest and precise as possible.

1. I would actively listen to ideas and opinions of the offender during a conversation
2. When working together with the offender, I would be willing to make compromises and concessions
3. In a disagreement I would establish common ground and work towards a resolution that benefits everyone involved
4. I would express appreciation and gratitude towards the offender for their contributions and efforts
5. I would willingly help the offender with their work, even if it means sacrificing my own time and/or resources
6. When working on a task with the offender, I communicate my thoughts and ideas well
7. I am likely to take initiative and take on additional responsibilities when working together with the offender on a task
8. I would refrain my own interests or desires for the sake of the offender
9. I perceive the offender as trustworthy
10. I believe there are two sides to an argument and try to take both views into account

#### **State Shame and Guilt Scale (SSGS).**

In the following, you will be asked about the feelings you have in the imagined situation.

Imagine you are in that situation right now. The following statements may or may not describe your feelings in the moment of that situation. Please rate each statement using the 5-point scale below. Remember to rate each statement based on the feelings you have in the moment of that situation.

Thinking about the moment of that situation...

1. I want to sink into the floor and disappear.
2. I feel remorse, regret.
3. I feel small.
4. I feel tension about something I have done.
5. I feel like I am a bad person.
6. I cannot stop thinking about something bad I have done.
7. I feel humiliated, disgraced.
8. I feel like apologizing, confessing.
9. I feel worthless, powerless.
10. I feel bad about something I have done.

#### **Willingness to participate.**

There are different ways of conducting Victim-Offender Mediation (VOM). The traditional way is face-to-face mediation in which an victim, offender and mediator meet physically. The digital equivalence would be computer-based VOM which takes place in an online environment (online video chat). These forms constitute a synchronous form of mediation.

Asynchronous forms of VOM also exist. One would be the exchange of video messages that have been recorded beforehand and send to the other party. Similarly, the affected parties can send each other written letters and share their narrative.

While having the situation in mind, please indicate how likely you, as the victim, are to participate in the following forms of Victim-Offender Mediation (1 = strongly disagree; 5 = strongly agree):

1. I would like to participate in face-to-face VOM.
2. I would like to participate in an online video chat.
3. I would like to exchange video messages.
4. I would like to exchange letters.

#### **Punishment and Restorative Justice.**

Generally, there are different approaches to punishment, the best known may be restorative justice and retributive justice.

Restorative justice includes the rehabilitation of the offender and remedying the damage done to the community and the victim. Retributive justice focuses less on the victim and community and more on the offender by imposing adequate punishment.

Rehabilitation is a one of the building blocks of restorative justice. It focuses on influencing the offender's behaviour and attitude. These can be tackled in different kinds of treatment or educational programmes in order to get the offender's life back on track.

Retribution soothes the victim and society by assuring that the offender has been punished effectively and adequately. This can, for instance, include incapacitation, which means to impose a prison sentence, curfew or electronic monitoring but also measures like restricting driving in response to driving under the influence.

Following, you will be presented with some statements about punishment. Please indicate to what extent you agree to these statements.

Please indicate how much you agree with the following items (1 = disagree strongly; 4 = strongly agree).

1. The primary concern with this criminal should be to make sure he is severely punished for his crime.
2. If the only way this criminal and others like him can be locked up is to build more prisons, then so be it.
3. The only way to prevent this criminal from committing future crimes is to keep him locked up.
4. The courts are generally too easy on people who commit this sort of crime.

Please indicate how much you agree with the following items (1 = strongly disagree; 4 = strongly agree).

1. Trying to rehabilitate this person would probably be a waste of time.
2. This offender would probably benefit from the psychological counseling programs offered in the prison.



3.If this offender received educational and vocational training in prison, he probably would not commit crimes in the future.

4.More effort needs to be made to expand and improve programs that would give this offender the chance to change his life.

### **Outcome satisfaction.**

The following statements relate to the imagined mediation result. Please indicate your personal satisfaction with the outcome on a scale from 1 - strongly disagree to 5 - strongly agree.

1. I would consider a VOM, if I find myself in an applicable situation.
2. I am satisfied with the overall result of the imagined mediation.
3. It was satisfying to envision the apology from the offender.
4. I would not recommend VOM to a friend.
5. It was satisfying to visualize that the offender promises not to repeat his wrongdoing.

### **Control variables.**

Please honestly answer the following questions regarding your experiences during this study from a scale of 1 = "Not at all" to 5 = "Very much so".

1. To what extent could you empathize with the scenario you read in the beginning?
2. To what extent could you imagine being the victim / offender?
3. To what extent could you empathize with the feelings of the victim / offender?
4. To what extent could you empathize with the thoughts of the victim / offender?
5. To what extent did you answer the questions seriously?
6. To what extent did you read the scenarios thoroughly?
7. To what extent did you feel that someone observed you?
8. To what extent did you feel confident to act as naturalistic as you would in real-life?

How often did you engage with the Videos presented to you?

1. Number of times of the online victim-offender mediation

2. Number of times of the face-to-face  
victim-offender mediation

Please rate your motivation during this study on a scale from 1 = "Not at all" to 5 = "Very much". Please pick the answer that best describes the way you feel.

How motivated were you during this study?

Lastly, we would like you to answer some questions about yourself. Please answer the questions as honestly and accurately as you can.

Did you ever commit a crime yourself in your life?

- Yes, a rather minor crime (e.g. vandalism)
- Yes, a rather severe crime (e.g. robbery)
- No
- I don't want to answer this question

Has one of your relatives and/or friends ever committed a crime?

- Yes, a rather minor crime (e.g. vandalism)
- Yes, a rather severe crime (e.g. robbery)
- No
- I don't want to answer this question

Did you ever been a victim of a crime in your life?

- Yes, a rather minor crime (e.g. vandalism)
- Yes, a rather severe crime (e.g. robbery)
- No
- I don't want to answer this question

Has one of your relatives and/or friends ever been a victim of a crime?

- Yes, a rather minor crime (e.g. vandalism)
- Yes, a rather severe crime (e.g. robbery)
- No
- I don't want to answer this question

**Debrief.**

**Debrief**

**"Start the meeting" - The effects of victim-offender mediation**

**Study objective**

In the past two years the pandemic enormously accelerated the global, digital transformation of our communication infrastructure and people in all societal domains needed to identify new ways to communicate with each other amid the pandemic; online connectivity increased substantially. Similarly, mediation agencies had to find alternative solutions for conflicting parties to communicate, since face-to-face meetings could not be held. Yet, there is not much known about the effects of online communication in victim-offender mediation in the long term. Will it even be a better, more efficient and cost saving way for victims and offenders to communicate, for example, if both parties live far away or are too afraid to meet in person, but still have high needs to receive information from or about the other party? This research will contribute to the question if digital communication might be a necessary addition that deserves systematic implementation in practice. The research assesses different factors that might determine the willingness to participate in (digital) VOM and which differences exist between the different forms.

**How did it work?**

As a participant in this study you observed a victim-offender mediation either in form of a face-to-face mediation or an online mediation. In the presented scene you observed three human actors engage in a victim-offender mediation. The variable we manipulated was your role in the victim-offender mediation, where at random you have been assigned to either of the two options of being an offender or a victim. After observing each scene in a random order you answered questions about four different types of variables:

Empathy Offender: Offenders who attend online victim-offender mediation feel less empathic toward the victim than offenders who attend a face to face victim offender mediation.

Attitudes Victims: To what extent does the victim's attitude influence the willingness to participate in (digital) Victim-Offender Mediation?

Guilt/Shame Offender: To what extent do offender's feelings of guilt/shame affect their willingness to participate in digital VOM/video messages?

Cooperation Participants: The study observes how cooperation of a participant towards the other negotiation Partner influences Outcome satisfaction and whether the form of VOM has effects on the cooperation Level of the participants.

**Why is this important?**

By participating in this study, you contributed your part to research online victim offender mediation. This research adds to the existing pool of knowledge on victim-offender mediation by examining the methodology used when conducting research in this field.

**Withdrawing Policy.**

If you decide that you want to withdraw from this research, please contact us (researchers) within 10 days and quote your participation number to allow us to locate your data and withdraw it.

Your participation number is: ...

If you have questions about your rights as a research participant, wish to obtain information, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee, [ethicscommittee-bms@utwente.nl](mailto:ethicscommittee-bms@utwente.nl)

For further information about this study, contact one of the investigators:

Alex Schapowal: [a.schapowal@student.utwente.nl](mailto:a.schapowal@student.utwente.nl)

Judith Steinhauer: [j.steinhauer@student.utwente.nl](mailto:j.steinhauer@student.utwente.nl)

Leonie Vosse: [l.vosse@student.utwente.nl](mailto:l.vosse@student.utwente.nl)

Lara Bekemeier: [l.c.bekemeier@student.utwente.nl](mailto:l.c.bekemeier@student.utwente.nl)

The supervisor of this study is: [f.bonensteffen@utwente.nl](mailto:f.bonensteffen@utwente.nl)

**Many thanks for taking the time to participate in our research!**

**Appendix D*****Survey Flow*****Table 1***Survey flow of the participants*

	<b>Offender</b>	<b>Victim</b>
	Situation of a crime; Offender view	Situation of a crime; victim view
	Cooperation towards Victim	Cooperation towards Offender
	State Shame and Guilt Scale (SSGS)	Punishment
	Willingness to participate; Offender	Willingness to participate; Victim before
<b>Online</b>	Outcome satisfaction	Outcome satisfaction
<b>Online</b>	Cooperation towards Victim	Cooperation towards Offender
<b>Online</b>	VERA	Willingness to participate; Victim (CBC)
<b>Face-to-Face</b>	Outcome satisfaction	Outcome satisfaction
<b>Face-to-Face</b>	Cooperation towards Victim	Cooperation towards Offender
<b>Face-to-Face</b>	VERA	Willingness to participate; Victim (FTF)
	About filling out the study; Offender	About filling out the study; Victim
	Control variables	Control variables
	Debrief	Debrief



## Appendix E

**Table 4**

*Descriptive statistics for DV per Control Variable*

Measure	Online					F2F				
	Not at all	Slightly	Neutral	Moderately	Very much so	Not at all	Slightly	Neutral	Moderately	Very much so
Total empathy	NA	M = 2.39, SD = 1.18	M = 2.84, SD = 1.33	M = 3.25, SD = 1.39	M = 3.308, SD = 1.606	NA	M = 2.39, SD = 1.18	M = 2.84, SD = 1.33	M = 3.25, SD = 1.39	M = 3.309, SD = 1.37
Cognitive empathy	NA	M = 2.24, SD = 1.07	M = 2.86, SD = 1.28	M = 3.36, SD = 1.3	M = 3.45, SD = 1.63	NA	M = 2.24, SD = 1.07	M = 2.86, SD = 1.28	M = 3.36, SD = 1.3	M = 3.45, SD = 1.63
Affective empathy	NA	M = 2.54, SD = 1.24	M = 2.904, SD = 1.35	M = 3.404, SD = 1.37	M = 3.79, SD = 1.49	NA	M = 2.54, SD = 1.24	M = 2.904, SD = 1.35	M = 3.404, SD = 1.37	M = 3.79, SD = 1.49

## Appendix F

### *R Code*

```
#Load the required packages
library(tidyverse)
library(psych)
library(dplyr)
library(readr)

citation("tidyverse")
citation("psych")
citation("dplyr")
citation("readr")

#Open dataset
Mediation_Data <- read_csv("Desktop/Bachelor Theisis/Mediation_Data.csv")

#Rename the Questions
Mediation <- rename(Mediation_Data, ResponseID = 9,
  Consent = 18,
  Age = 19,
  Gender = 20,
  Nationality = 21,
  Education = 22,
  EducationText = 23,
  Employment = 24,
  EmploymentTextStudent = 25,
  EmploymentText = 26,
  CognitiveWorriedOnline = 70,
  CognitiveSadOnline = 71,
  CognitiveUpsetinsideOnline = 72,
  CognitiveDistressedOnline = 73,
  CognitiveSorryOnline = 74,
  CognitiveDisturbedOnline = 75,
  CognitiveAngryOnline = 76,
```



CognitiveDisgustedOnline = 77,  
CognitiveFrightenedOnline = 78,  
CognitiveThrilledOnline = 79,  
CognitiveInterestedOnline = 80,  
CognitiveHappyOnline = 81,  
CognitiveExcitedOnline = 82,  
AffectiveWorriedOnline = 83,  
AffectiveSadOnline = 84,  
AffectiveUpsetinsideOnline = 85,  
AffectiveDistressedOnline = 86,  
AffectiveSorryOnline = 87,  
AffectiveDisturbedOnline = 88,  
AffectiveAngryOnline = 89,  
AffectiveDisgustedOnline = 90,  
AffectiveFrightenedOnline = 91,  
AffectiveThrilledOnline = 92,  
AffectiveInterestedOnline = 93,  
AffectiveHappyOnline = 94,  
AffectiveExcitedOnline = 95,  
CognitiveWorriedF2F = 115,  
CognitiveSadF2F = 116,  
CognitiveUpsetinsideF2F = 117,  
CognitiveDistressedF2F = 118,  
CognitiveSorryF2F = 119,  
CognitiveDisturbedF2F = 120,  
CognitiveAngryF2F = 121,  
CognitiveDisgustedF2F = 122,  
CognitiveFrightenedF2F = 123,  
CognitiveThrilledF2F = 124,  
CognitiveInterestedF2F = 125,  
CognitiveHappyF2F = 126,  
CognitiveExcitedF2F = 127,  
AffectiveWorriedF2F = 128,  
AffectiveSadF2F = 129,

AffectiveUpsetinsideF2F = 130,  
 AffectiveDistressedF2F = 131,  
 AffectiveSorryF2F = 132,  
 AffectiveDisturbedF2F = 133,  
 AffectiveAngryF2F = 134,  
 AffectiveDisgustedF2F = 135,  
 AffectiveFrightenedF2F = 136,  
 AffectiveThrilledF2F = 137,  
 AffectiveInterestedF2F = 138,  
 AffectiveHappyF2F = 139,  
 AffectiveExcitedF2F = 140,  
 ControlQuestion\_Empathize\_Scenario = 141,  
 ControlQuestion\_imagine\_being\_offender = 142,  
 ControlQuestion\_empathize\_with\_feelings\_of\_offender = 143,  
 ControlQuestion\_empathize\_with\_thoughts\_of\_offender = 144,  
 ControlQuestion\_answer\_questions\_seriously = 145,  
 ControlQuestion\_read\_scenarios\_thoroughly = 146,  
 ControlQuestion\_feel\_confident\_to\_act\_as\_naturalistic\_as\_you\_would\_real\_life  
 = 148,  
 ControlQuestion\_motivation\_during\_this\_study = 151)

#Determine final data set

#Omit unnecessary information

```

Mediation2 <- Mediation %>% select(ResponseID, Consent, Age, Gender, Nationality,
Education, EducationText, Employment, EmploymentTextStudent, EmploymentText,
CognitiveWorriedOnline, CognitiveSadOnline, CognitiveUpsetinsideOnline,
CognitiveDistressedOnline, CognitiveSorryOnline, CognitiveDisturbedOnline,
CognitiveAngryOnline, CognitiveDisgustedOnline, CognitiveFrightenedOnline,
CognitiveThrilledOnline, CognitiveInterestedOnline, CognitiveHappyOnline,
CognitiveExcitedOnline, AffectiveWorriedOnline, AffectiveSadOnline,
AffectiveUpsetinsideOnline, AffectiveDistressedOnline, AffectiveSorryOnline,
AffectiveDisturbedOnline, AffectiveAngryOnline, AffectiveDisgustedOnline,
AffectiveFrightenedOnline, AffectiveThrilledOnline, AffectiveInterestedOnline,
AffectiveHappyOnline, AffectiveExcitedOnline, CognitiveWorriedF2F, CognitiveSadF2F,

```

```

CognitiveUpsetinsideF2F, CognitiveDistressedF2F, CognitiveSorryF2F,
CognitiveDisturbedF2F, CognitiveAngryF2F, CognitiveDisgustedF2F,
CognitiveFrightenedF2F, CognitiveThrilledF2F, CognitiveInterestedF2F,
CognitiveHappyF2F, CognitiveExcitedF2F, AffectiveWorriedF2F, AffectiveSadF2F,
AffectiveUpsetinsideF2F, AffectiveDistressedF2F, AffectiveSorryF2F,
AffectiveDisturbedF2F, AffectiveAngryF2F, AffectiveDisgustedF2F,
AffectiveFrightenedF2F, AffectiveThrilledF2F, AffectiveInterestedF2F, AffectiveHappyF2F,
AffectiveExcitedF2F, ControlQuestion_Empathize_Scenario,
ControlQuestion_imagine_being_offender,
ControlQuestion_empathize_with_feelings_of_offender,
ControlQuestion_empathize_with_thoughts_of_offender,
ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,
ControlQuestion_motivation_during_this_study)

```

```
#Exclude participants
```

```
Mediation <- Mediation2 %>% filter(Consent == 1, Age >= 18)
```

```
#Create a new data frame with only the observations that have non-missing values in VERA
```

```
Mediation <- Mediation[complete.cases(Mediation$CognitiveSadOnline), ]
```

```
#Transformed the data form character to numeric
```

```
Mediation$Consent <- as.numeric(Mediation$Consent)
```

```
Mediation$Age <- as.numeric(Mediation$Age)
```

```
Mediation$Gender <- as.numeric(Mediation$Gender)
```

```
Mediation$Nationality <- as.numeric(Mediation$Nationality)
```

```
Mediation$Education <- as.numeric(Mediation$Education)
```

```
Mediation$Employment <- as.numeric(Mediation$Employment)
```

```
Mediation$EmploymentTextStudent <- as.numeric(Mediation$EmploymentTextStudent)
```

```
Mediation$EmploymentText <- as.numeric(Mediation$EmploymentText)
```

```
Mediation$CognitiveWorriedOnline <- as.numeric(Mediation$CognitiveWorriedOnline)
```

```
Mediation$CognitiveSadOnline <- as.numeric(Mediation$CognitiveSadOnline)
```

```
Mediation$CognitiveUpsetinsideOnline <-
as.numeric(Mediation$CognitiveUpsetinsideOnline)
```

```

Mediation$CognitiveDistressedOnline <- as.numeric(Mediation$CognitiveDistressedOnline)
Mediation$CognitiveSorryOnline <- as.numeric(Mediation$CognitiveSorryOnline)
Mediation$CognitiveDisturbedOnline <- as.numeric(Mediation$CognitiveDisturbedOnline)
Mediation$CognitiveAngryOnline <- as.numeric(Mediation$CognitiveAngryOnline)
Mediation$CognitiveDisgustedOnline <- as.numeric(Mediation$CognitiveDisgustedOnline)
Mediation$CognitiveFrightenedOnline <- as.numeric(Mediation$CognitiveFrightenedOnline)
Mediation$CognitiveThrilledOnline <- as.numeric(Mediation$CognitiveThrilledOnline)
Mediation$CognitiveInterestedOnline <- as.numeric(Mediation$CognitiveInterestedOnline)
Mediation$CognitiveHappyOnline <- as.numeric(Mediation$CognitiveHappyOnline)
Mediation$CognitiveExcitedOnline <- as.numeric(Mediation$CognitiveExcitedOnline)
Mediation$AffectiveWorriedOnline <- as.numeric(Mediation$AffectiveWorriedOnline)
Mediation$AffectiveSadOnline <- as.numeric(Mediation$AffectiveSadOnline)
Mediation$AffectiveUpsetinsideOnline <-
as.numeric(Mediation$AffectiveUpsetinsideOnline)
Mediation$AffectiveDistressedOnline <- as.numeric(Mediation$AffectiveDistressedOnline)
Mediation$AffectiveSorryOnline <- as.numeric(Mediation$AffectiveSorryOnline)
Mediation$AffectiveDisturbedOnline <- as.numeric(Mediation$AffectiveDisturbedOnline)
Mediation$AffectiveAngryOnline <- as.numeric(Mediation$AffectiveAngryOnline)
Mediation$AffectiveDisgustedOnline <- as.numeric(Mediation$AffectiveDisgustedOnline)
Mediation$AffectiveFrightenedOnline <- as.numeric(Mediation$AffectiveFrightenedOnline)
Mediation$AffectiveThrilledOnline <- as.numeric(Mediation$AffectiveThrilledOnline)
Mediation$AffectiveInterestedOnline <- as.numeric(Mediation$AffectiveInterestedOnline)
Mediation$AffectiveHappyOnline <- as.numeric(Mediation$AffectiveHappyOnline)
Mediation$AffectiveExcitedOnline <- as.numeric(Mediation$AffectiveExcitedOnline)
Mediation$CognitiveWorriedF2F <- as.numeric(Mediation$CognitiveWorriedF2F)
Mediation$CognitiveSadF2F <- as.numeric(Mediation$CognitiveSadF2F)
Mediation$CognitiveUpsetinsideF2F <- as.numeric(Mediation$CognitiveUpsetinsideF2F)
Mediation$CognitiveDistressedF2F <- as.numeric(Mediation$CognitiveDistressedF2F)
Mediation$CognitiveSorryF2F <- as.numeric(Mediation$CognitiveSorryF2F)
Mediation$CognitiveDisturbedF2F <- as.numeric(Mediation$CognitiveDisturbedF2F)
Mediation$CognitiveAngryF2F <- as.numeric(Mediation$CognitiveAngryF2F)
Mediation$CognitiveDisgustedF2F <- as.numeric(Mediation$CognitiveDisgustedF2F)
Mediation$CognitiveFrightenedF2F <- as.numeric(Mediation$CognitiveFrightenedF2F)
Mediation$CognitiveThrilledF2F <- as.numeric(Mediation$CognitiveThrilledF2F)

```

```

Mediation$CognitiveInterestedF2F <- as.numeric(Mediation$CognitiveInterestedF2F)
Mediation$CognitiveHappyF2F <- as.numeric(Mediation$CognitiveHappyF2F)
Mediation$CognitiveExcitedF2F <- as.numeric(Mediation$CognitiveExcitedF2F)
Mediation$AffectiveWorriedF2F <- as.numeric(Mediation$AffectiveWorriedF2F)
Mediation$AffectiveSadF2F <- as.numeric(Mediation$AffectiveSadF2F)
Mediation$AffectiveUpsetinsideF2F <- as.numeric(Mediation$AffectiveUpsetinsideF2F)
Mediation$AffectiveDistressedF2F <- as.numeric(Mediation$AffectiveDistressedF2F)
Mediation$AffectiveSorryF2F <- as.numeric(Mediation$AffectiveSorryF2F)
Mediation$AffectiveDisturbedF2F <- as.numeric(Mediation$AffectiveDisturbedF2F)
Mediation$AffectiveAngryF2F <- as.numeric(Mediation$AffectiveAngryF2F)
Mediation$AffectiveDisgustedF2F <- as.numeric(Mediation$AffectiveDisgustedF2F)
Mediation$AffectiveFrightenedF2F <- as.numeric(Mediation$AffectiveFrightenedF2F)
Mediation$AffectiveThrilledF2F <- as.numeric(Mediation$AffectiveThrilledF2F)
Mediation$AffectiveInterestedF2F <- as.numeric(Mediation$AffectiveInterestedF2F)
Mediation$AffectiveHappyF2F <- as.numeric(Mediation$AffectiveHappyF2F)
Mediation$AffectiveExcitedF2F <- as.numeric(Mediation$AffectiveExcitedF2F)
Mediation$ControlQuestion_Empathize_Scenario <-
as.numeric(Mediation$ControlQuestion_Empathize_Scenario)
Mediation$ControlQuestion_imagine_being_offender <-
as.numeric(Mediation$ControlQuestion_imagine_being_offender)
Mediation$ControlQuestion_empathize_with_feelings_of_offender <-
as.numeric(Mediation$ControlQuestion_empathize_with_feelings_of_offender)
Mediation$ControlQuestion_empathize_with_thoughts_of_offender <-
as.numeric(Mediation$ControlQuestion_empathize_with_thoughts_of_offender)
Mediation$ControlQuestion_answer_questions_seriously <-
as.numeric(Mediation$ControlQuestion_answer_questions_seriously)
Mediation$ControlQuestion_read_scenarios_thoroughly <-
as.numeric(Mediation$ControlQuestion_read_scenarios_thoroughly)
Mediation$ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life
<-
as.numeric(Mediation$ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life)
Mediation$ControlQuestion_motivation_during_this_study <-
as.numeric(Mediation$ControlQuestion_motivation_during_this_study)

```

```

# Calculate the standard deviation for each variable
# Subset the data for male participants
male_data <- Mediation[Mediation$Gender == 1, ]

# Calculate the standard deviation and mean for the relevant variables
sd_age <- sd(male_data$Age)
mean_age <- mean(male_data$Age)

# Print the standard deviation and mean
print(sd_age)
print(mean_age)

# Subset the data for female participants
female_data <- Mediation[Mediation$Gender == 2, ]

# Calculate the standard deviation and mean for the relevant variables
sd_age <- sd(female_data$Age)
mean_age <- mean(female_data$Age)

# Print the standard deviation and mean
print(sd_age)
print(mean_age)

# Determine validity and reliability
# Select the items for factor analysis1 (cognitive empathy)
VERACognitiveOnline <- select(Mediation, ResponseID, CognitiveWorriedOnline,
CognitiveSadOnline, CognitiveUpsetinsideOnline, CognitiveDistressedOnline,
CognitiveSorryOnline, CognitiveDisturbedOnline, CognitiveAngryOnline,
CognitiveDisgustedOnline, CognitiveFrightenedOnline, CognitiveThrilledOnline,
CognitiveInterestedOnline, CognitiveHappyOnline, CognitiveExcitedOnline)
VERACognitiveF2F <- select(Mediation, ResponseID, CognitiveWorriedF2F,
CognitiveSadF2F, CognitiveUpsetinsideF2F, CognitiveDistressedF2F, CognitiveSorryF2F,

```

CognitiveDisturbedF2F, CognitiveAngryF2F, CognitiveDisgustedF2F,  
 CognitiveFrightenedF2F, CognitiveThrilledF2F, CognitiveInterestedF2F,  
 CognitiveHappyF2F, CognitiveExcitedF2F)

#merge data

```
VERACognitive <- merge(VERACognitiveOnline, VERACognitiveF2F, by = "ResponseID",
all = TRUE)
```

```
VERACognitive$CombinedWorried <- rowSums(VERACognitive[,
c("CognitiveWorriedOnline", "CognitiveWorriedF2F")])
```

```
VERACognitive$CombinedSad <- rowSums(VERACognitive[, c("CognitiveSadOnline",
"CognitiveSadF2F")])
```

```
VERACognitive$CombinedUpsetinside <- rowSums(VERACognitive[,
c("CognitiveUpsetinsideOnline", "CognitiveUpsetinsideF2F")])
```

```
VERACognitive$CombinedDistressed <- rowSums(VERACognitive[,
c("CognitiveDistressedOnline", "CognitiveDistressedF2F")])
```

```
VERACognitive$CombinedSorry <- rowSums(VERACognitive[, c("CognitiveSorryOnline",
"CognitiveSorryF2F")])
```

```
VERACognitive$CombinedDisturbed <- rowSums(VERACognitive[,
c("CognitiveDisturbedOnline", "CognitiveDisturbedF2F")])
```

```
VERACognitive$CombinedAngry <- rowSums(VERACognitive[,
c("CognitiveAngryOnline", "CognitiveAngryF2F")])
```

```
VERACognitive$CombinedDisgusted <- rowSums(VERACognitive[,
c("CognitiveDisgustedOnline", "CognitiveDisgustedF2F")])
```

```
VERACognitive$CombinedFrightened <- rowSums(VERACognitive[,
c("CognitiveFrightenedOnline", "CognitiveFrightenedF2F")])
```

```
VERACognitive$CombinedThrilled <- rowSums(VERACognitive[,
c("CognitiveThrilledOnline", "CognitiveThrilledF2F")])
```

```
VERACognitive$CombinedInterested <- rowSums(VERACognitive[,
c("CognitiveInterestedOnline", "CognitiveInterestedF2F")])
```

```
VERACognitive$CombinedHappy <- rowSums(VERACognitive[,
c("CognitiveHappyOnline", "CognitiveHappyF2F")])
```

```
VERACognitive$CombinedExcited <- rowSums(VERACognitive[,
c("CognitiveExcitedOnline", "CognitiveExcitedF2F")])
```

```

VERACognitive <- VERACognitive[, !names(VERACognitive) %in% c("ResponseID",
"CognitiveWorriedOnline", "CognitiveWorriedF2F", "CognitiveSadOnline",
"CognitiveSadF2F", "CognitiveUpsetinsideOnline", "CognitiveUpsetinsideF2F",
"CognitiveDistressedOnline", "CognitiveDistressedF2F", "CognitiveSorryOnline",
"CognitiveSorryF2F", "CognitiveDisturbedOnline", "CognitiveDisturbedF2F",
"CognitiveAngryOnline", "CognitiveAngryF2F", "CognitiveDisgustedOnline",
"CognitiveDisgustedF2F", "CognitiveFrightenedOnline", "CognitiveFrightenedF2F",
"CognitiveThrilledOnline", "CognitiveThrilledF2F", "CognitiveInterestedOnline",
"CognitiveInterestedF2F", "CognitiveHappyOnline", "CognitiveHappyF2F",
"CognitiveExcitedOnline", "CognitiveExcitedF2F")]

```

```

# Perform factor analysis to assess validity

```

```

fa(VERACognitive, nfactors = 1, rotate = "varimax")

```

```

# Perform factor analysis

```

```

factor_analysis <- fa(r = VERACognitive, nfactors = 1, rotate = "varimax")

```

```

# Get eigenvalue

```

```

eigenvalue <- factor_analysis$values[1]

```

```

# Print eigenvalue and loadings

```

```

print(eigenvalue)

```

```

# Select the items for factor analysis1 (affective empathy)

```

```

VERAAffectiveOnline <- select(Mediation, ResponseID, AffectiveWorriedOnline,
AffectiveSadOnline, AffectiveUpsetinsideOnline, AffectiveDistressedOnline,
AffectiveSorryOnline, AffectiveDisturbedOnline, AffectiveAngryOnline,
AffectiveDisgustedOnline, AffectiveFrightenedOnline, AffectiveThrilledOnline,
AffectiveInterestedOnline, AffectiveHappyOnline, AffectiveExcitedOnline)

```

```

VERAAffectiveF2F <- select(Mediation, ResponseID, AffectiveWorriedF2F,
AffectiveSadF2F, AffectiveUpsetinsideF2F, AffectiveDistressedF2F, AffectiveSorryF2F,
AffectiveDisturbedF2F, AffectiveAngryF2F, AffectiveDisgustedF2F,

```



```
AffectiveFrightenedF2F, AffectiveThrilledF2F, AffectiveInterestedF2F, AffectiveHappyF2F,
AffectiveExcitedF2F)
```

```
#merge data
```

```
VERAAffective <- merge(VERAAffectiveOnline, VERAAffectiveF2F, by = "ResponseID",
all = TRUE)
```

```
VERAAffective$CombinedWorried <- rowSums(VERAAffective[,
c("AffectiveWorriedOnline", "AffectiveWorriedF2F")])
```

```
VERAAffective$CombinedSad <- rowSums(VERAAffective[, c("AffectiveSadOnline",
"AffectiveSadF2F")])
```

```
VERAAffective$CombinedUpsetinside <- rowSums(VERAAffective[,
c("AffectiveUpsetinsideOnline", "AffectiveUpsetinsideF2F")])
```

```
VERAAffective$CombinedDistressed <- rowSums(VERAAffective[,
c("AffectiveDistressedOnline", "AffectiveDistressedF2F")])
```

```
VERAAffective$CombinedSorry <- rowSums(VERAAffective[, c("AffectiveSorryOnline",
"AffectiveSorryF2F")])
```

```
VERAAffective$CombinedDisturbed <- rowSums(VERAAffective[,
c("AffectiveDisturbedOnline", "AffectiveDisturbedF2F")])
```

```
VERAAffective$CombinedAngry <- rowSums(VERAAffective[, c("AffectiveAngryOnline",
"AffectiveAngryF2F")])
```

```
VERAAffective$CombinedDisgusted <- rowSums(VERAAffective[,
c("AffectiveDisgustedOnline", "AffectiveDisgustedF2F")])
```

```
VERAAffective$CombinedFrightened <- rowSums(VERAAffective[,
c("AffectiveFrightenedOnline", "AffectiveFrightenedF2F")])
```

```
VERAAffective$CombinedThrilled <- rowSums(VERAAffective[,
c("AffectiveThrilledOnline", "AffectiveThrilledF2F")])
```

```
VERAAffective$CombinedInterested <- rowSums(VERAAffective[,
c("AffectiveInterestedOnline", "AffectiveInterestedF2F")])
```

```
VERAAffective$CombinedHappy <- rowSums(VERAAffective[, c("AffectiveHappyOnline",
"AffectiveHappyF2F")])
```

```
VERAAffective$CombinedExcited <- rowSums(VERAAffective[,
c("AffectiveExcitedOnline", "AffectiveExcitedF2F")])
```

```
VERAAffective <- VERAAffective[, !names(VERAAffective) %in% c("ResponseID",
"AffectiveWorriedOnline", "AffectiveWorriedF2F", "AffectiveSadOnline",
```

```
"AffectiveSadF2F", "AffectiveUpsetinsideOnline", "AffectiveUpsetinsideF2F",
"AffectiveDistressedOnline", "AffectiveDistressedF2F", "AffectiveSorryOnline",
"AffectiveSorryF2F", "AffectiveDisturbedOnline", "AffectiveDisturbedF2F",
"AffectiveAngryOnline", "AffectiveAngryF2F", "AffectiveDisgustedOnline",
"AffectiveDisgustedF2F", "AffectiveFrightenedOnline", "AffectiveFrightenedF2F",
"AffectiveThrilledOnline", "AffectiveThrilledF2F", "AffectiveInterestedOnline",
"AffectiveInterestedF2F", "AffectiveHappyOnline", "AffectiveHappyF2F",
"AffectiveExcitedOnline", "AffectiveExcitedF2F"]]
```

```
# Perform factor analysis to assess validity
```

```
fa(VERAAffective, nfactors = 1, rotate = "varimax")
```

```
# Perform factor analysis
```

```
factor_analysis <- fa(r = VERAAffective, nfactors = 1, rotate = "varimax")
```

```
# Get eigenvalue
```

```
eigenvalue <- factor_analysis$values[1]
```

```
# Print eigenvalue and loadings
```

```
print(eigenvalue)
```

```
# Perform Cronbach's alpha to assess reliability
```

```
alpha(x = VERAAffective, check.keys = TRUE)
```

```
alpha(x = VERACognitive, check.keys = TRUE)
```

```
# Filter columns for the online group
```

```
Online <- Mediation %>%
```

```
  select(ResponseID, CognitiveWorriedOnline:AffectiveExcitedOnline)
```

```
OnlineC <- Mediation %>%
```

```
  select(ResponseID, CognitiveWorriedOnline:CognitiveExcitedOnline)
```

```
OnlineA <- Mediation %>%
```

```
  select(ResponseID, AffectiveWorriedOnline:AffectiveExcitedOnline)
```

```

# Filter columns for the face-to-face group
F2F <- Mediation %>%
  select(ResponseID, CognitiveWorriedF2F:AffectiveExcitedF2F)

F2FC <- Mediation %>%
  select(ResponseID, CognitiveWorriedF2F:CognitiveExcitedF2F)

F2FA <- Mediation %>%
  select(ResponseID, AffectiveWorriedF2F:AffectiveExcitedF2F)

# Reshape the data from wide to long format
# Reshape Online data
Online_long <- Online %>%
  pivot_longer(
    cols = -ResponseID,
    names_to = "Variable",
    values_to = "Value")

OnlineC_long <- OnlineC %>%
  pivot_longer(
    cols = -ResponseID,
    names_to = "Variable",
    values_to = "Value")

OnlineA_long <- OnlineA %>%
  pivot_longer(
    cols = -ResponseID,
    names_to = "Variable",
    values_to = "Value")

# Reshape F2F data
F2F_long <- F2F %>%
  pivot_longer(

```

```

cols = -ResponseID,
names_to = "Variable",
values_to = "Value")

F2FC_long <- F2FC %>%
  pivot_longer(
    cols = -ResponseID,
    names_to = "Variable",
    values_to = "Value")

F2FA_long <- F2FA %>%
  pivot_longer(
    cols = -ResponseID,
    names_to = "Variable",
    values_to = "Value")

# Calculate descriptive statistics per condition
#Online Total
mean_value <- mean(Online_long$Value, na.rm = TRUE)
sd_value <- sd(Online_long$Value, na.rm = TRUE)
#Online Cognitive
mean_value <- mean(OnlineC_long$Value, na.rm = TRUE)
sd_value <- sd(OnlineC_long$Value, na.rm = TRUE)
#Online Affective
mean_value <- mean(OnlineA_long$Value, na.rm = TRUE)
sd_value <- sd(OnlineA_long$Value, na.rm = TRUE)

#F2F total
mean_value <- mean(F2F_long$Value, na.rm = TRUE)
sd_value <- sd(F2F_long$Value, na.rm = TRUE)
#F2F Cognitive
mean_value <- mean(F2FC_long$Value, na.rm = TRUE)
sd_value <- sd(F2FC_long$Value, na.rm = TRUE)
#F2F Affective

```

```

mean_value <- mean(F2FA_long$Value, na.rm = TRUE)
sd_value <- sd(F2FA_long$Value, na.rm = TRUE)

#Descriptives per Gender
# Filter columns for the online group
Online <- Mediation %>%
  select(ResponseID, Gender, CognitiveWorriedOnline:AffectiveExcitedOnline)

OnlineC <- Mediation %>%
  select(ResponseID, Gender, CognitiveWorriedOnline:CognitiveExcitedOnline)

OnlineA <- Mediation %>%
  select(ResponseID, Gender, AffectiveWorriedOnline:AffectiveExcitedOnline)

# Reshape the data from wide to long format
Online_long <- Online %>%
  pivot_longer(
    cols = -c(ResponseID, Gender),
    names_to = "Variable",
    values_to = "Value")

OnlineC_long <- OnlineC %>%
  pivot_longer(
    cols = -c(ResponseID, Gender),
    names_to = "Variable",
    values_to = "Value")

OnlineA_long <- OnlineA %>%
  pivot_longer(
    cols = -c(ResponseID, Gender),
    names_to = "Variable",
    values_to = "Value")

```

```

descriptive_stats_Online <- Online_long %>%
  group_by(Gender) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

```

```

descriptive_stats_OnlineC <- OnlineC_long %>%
  group_by(Gender) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

```

```

descriptive_stats_OnlineA <- OnlineA_long %>%
  group_by(Gender) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

```

```
# Filter columns for the face-to-face group
```

```

F2F <- Mediation %>%
  select(ResponseID, Gender, CognitiveWorriedF2F:AffectiveExcitedF2F)

```

```

F2FC <- Mediation %>%
  select(ResponseID, Gender, CognitiveWorriedF2F:CognitiveExcitedF2F)

```

```
F2FA <- Mediation %>%
  select(ResponseID, Gender, AffectiveWorriedF2F:AffectiveExcitedF2F)

# Reshape the data from wide to long format
F2F_long <- F2F %>%
  pivot_longer(
    cols = -c(ResponseID, Gender),
    names_to = "Variable",
    values_to = "Value")

F2FC_long <- F2FC %>%
  pivot_longer(
    cols = -c(ResponseID, Gender),
    names_to = "Variable",
    values_to = "Value")

F2FA_long <- F2FA %>%
  pivot_longer(
    cols = -c(ResponseID, Gender),
    names_to = "Variable",
    values_to = "Value")

descriptive_stats_F2F <- F2F_long %>%
  group_by(Gender) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

descriptive_stats_F2FC <- F2FC_long %>%
  group_by(Gender) %>%
  summarize(
```

```

Mean = mean(Value, na.rm = TRUE),
Median = median(Value, na.rm = TRUE),
SD = sd(Value, na.rm = TRUE),
Min = min(Value, na.rm = TRUE),
Max = max(Value, na.rm = TRUE))

```

```

descriptive_stats_F2FA <- F2FA_long %>%
  group_by(Gender) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

```

```
#Descriptives for control questions Online
```

```

Online <- Mediation %>%
  select(ResponseID, ControlQuestion_Empathize_Scenario,
  ControlQuestion_imagine_being_offender,
  ControlQuestion_empathize_with_feelings_of_offender,
  ControlQuestion_empathize_with_thoughts_of_offender,
  ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
  ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,
  ControlQuestion_motivation_during_this_study,
  CognitiveWorriedOnline:AffectiveExcitedOnline)

```

```

OnlineC <- Mediation %>%
  select(ResponseID, ControlQuestion_Empathize_Scenario,
  ControlQuestion_imagine_being_offender,
  ControlQuestion_empathize_with_feelings_of_offender,
  ControlQuestion_empathize_with_thoughts_of_offender,
  ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
  ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,

```



```
ControlQuestion_motivation_during_this_study,
CognitiveWorriedOnline:CognitiveExcitedOnline)
```

```
OnlineA <- Mediation %>%
  select(ResponseID, ControlQuestion_Empathize_Scenario,
ControlQuestion_imagine_being_offender,
ControlQuestion_empathize_with_feelings_of_offender,
ControlQuestion_empathize_with_thoughts_of_offender,
ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,
ControlQuestion_motivation_during_this_study,
AffectiveWorriedOnline:AffectiveExcitedOnline)
```

```
Online$ControlMean <- rowMeans(Online[, c("ControlQuestion_Empathize_Scenario",
"ControlQuestion_imagine_being_offender",
"ControlQuestion_empathize_with_feelings_of_offender",
"ControlQuestion_empathize_with_thoughts_of_offender",
"ControlQuestion_answer_questions_seriously",
"ControlQuestion_read_scenarios_thoroughly",
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
"ControlQuestion_motivation_during_this_study")], na.rm = TRUE)
```

```
OnlineC$ControlMean <- rowMeans(OnlineC[, c("ControlQuestion_Empathize_Scenario",
"ControlQuestion_imagine_being_offender",
"ControlQuestion_empathize_with_feelings_of_offender",
"ControlQuestion_empathize_with_thoughts_of_offender",
"ControlQuestion_answer_questions_seriously",
"ControlQuestion_read_scenarios_thoroughly",
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
"ControlQuestion_motivation_during_this_study")], na.rm = TRUE)
```

```
OnlineA$ControlMean <- rowMeans(OnlineA[, c("ControlQuestion_Empathize_Scenario",
"ControlQuestion_imagine_being_offender",
"ControlQuestion_empathize_with_feelings_of_offender",
"ControlQuestion_empathize_with_thoughts_of_offender",
"ControlQuestion_answer_questions_seriously",
```

```
"ControlQuestion_read_scenarios_thoroughly",
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
"ControlQuestion_motivation_during_this_study")], na.rm = TRUE)
```

```
# Divide the ControlMean values into groups around specific values
```

```
Online$ControlMeanGroup <- round(Online$ControlMean)
OnlineC$ControlMeanGroup <- round(OnlineC$ControlMean)
OnlineA$ControlMeanGroup <- round(OnlineA$ControlMean)
```

```
# Reshape the data from wide to long format
```

```
Online_long <- Online %>%
  pivot_longer(
    cols = -c(ResponseID, ControlMeanGroup),
    names_to = "Variable",
    values_to = "Value")
```

```
OnlineC_long <- OnlineC %>%
  pivot_longer(
    cols = -c(ResponseID, ControlMeanGroup),
    names_to = "Variable",
    values_to = "Value")
```

```
OnlineA_long <- OnlineA %>%
  pivot_longer(
    cols = -c(ResponseID, ControlMeanGroup),
    names_to = "Variable",
    values_to = "Value")
```

```
control_descriptive_stats_Online <- Online_long %>%
  group_by(ControlMeanGroup) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
```

```

Min = min(Value, na.rm = TRUE),
Max = max(Value, na.rm = TRUE))

```

```

control_descriptive_stats_OnlineC <- OnlineC_long %>%
  group_by(ControlMeanGroup) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

```

```

control_descriptive_stats_OnlineA <- OnlineA_long %>%
  group_by(ControlMeanGroup) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))

```

```

#Descriptives for control questions F2F

```

```

F2F <- Mediation %>%
  select(ResponseID, ControlQuestion_Empathize_Scenario,
    ControlQuestion_imagine_being_offender,
    ControlQuestion_empathize_with_feelings_of_offender,
    ControlQuestion_empathize_with_thoughts_of_offender,
    ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
    ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,
    ControlQuestion_motivation_during_this_study,
    CognitiveWorriedOnline:AffectiveExcitedOnline)

```

```

F2FC <- Mediation %>%

```

```

select(ResponseID, ControlQuestion_Empathize_Scenario,
ControlQuestion_imagine_being_offender,
ControlQuestion_empathize_with_feelings_of_offender,
ControlQuestion_empathize_with_thoughts_of_offender,
ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,
ControlQuestion_motivation_during_this_study,
CognitiveWorriedOnline:CognitiveExcitedOnline)

```

```
F2FA <- Mediation %>%
```

```

select(ResponseID, ControlQuestion_Empathize_Scenario,
ControlQuestion_imagine_being_offender,
ControlQuestion_empathize_with_feelings_of_offender,
ControlQuestion_empathize_with_thoughts_of_offender,
ControlQuestion_answer_questions_seriously, ControlQuestion_read_scenarios_thoroughly,
ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life,
ControlQuestion_motivation_during_this_study,
AffectiveWorriedOnline:AffectiveExcitedOnline)

```

```

F2F$ControlMean <- rowMeans(F2F[, c("ControlQuestion_Empathize_Scenario",
"ControlQuestion_imagine_being_offender",
"ControlQuestion_empathize_with_feelings_of_offender",
"ControlQuestion_empathize_with_thoughts_of_offender",
"ControlQuestion_answer_questions_seriously",
"ControlQuestion_read_scenarios_thoroughly",
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
"ControlQuestion_motivation_during_this_study")], na.rm = TRUE)
F2FC$ControlMean <- rowMeans(F2FC[, c("ControlQuestion_Empathize_Scenario",
"ControlQuestion_imagine_being_offender",
"ControlQuestion_empathize_with_feelings_of_offender",
"ControlQuestion_empathize_with_thoughts_of_offender",
"ControlQuestion_answer_questions_seriously",
"ControlQuestion_read_scenarios_thoroughly",

```

```

"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
"ControlQuestion_motivation_during_this_study")], na.rm = TRUE)
F2FA$ControlMean <- rowMeans(F2FA[, c("ControlQuestion_Empathize_Scenario",
"ControlQuestion_imagine_being_offender",
"ControlQuestion_empathize_with_feelings_of_offender",
"ControlQuestion_empathize_with_thoughts_of_offender",
"ControlQuestion_answer_questions_seriously",
"ControlQuestion_read_scenarios_thoroughly",
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
"ControlQuestion_motivation_during_this_study")], na.rm = TRUE)

# Divide the ControlMean values into groups around specific values
F2F$ControlMeanGroup <- round(F2F$ControlMean)
F2FC$ControlMeanGroup <- round(F2FC$ControlMean)
F2FA$ControlMeanGroup <- round(F2FA$ControlMean)

# Reshape the data from wide to long format
F2F_long <- F2F %>%
  pivot_longer(
    cols = -c(ResponseID, ControlMeanGroup),
    names_to = "Variable",
    values_to = "Value")

F2FC_long <- F2FC %>%
  pivot_longer(
    cols = -c(ResponseID, ControlMeanGroup),
    names_to = "Variable",
    values_to = "Value")

F2FA_long <- F2FA %>%
  pivot_longer(
    cols = -c(ResponseID, ControlMeanGroup),
    names_to = "Variable",
    values_to = "Value")

```

```
control_descriptive_stats_F2F <- F2F_long %>%
  group_by(ControlMeanGroup) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))
```

```
control_descriptive_stats_F2FC <- F2FC_long %>%
  group_by(ControlMeanGroup) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))
```

```
control_descriptive_stats_F2FA <- F2FA_long %>%
  group_by(ControlMeanGroup) %>%
  summarize(
    Mean = mean(Value, na.rm = TRUE),
    Median = median(Value, na.rm = TRUE),
    SD = sd(Value, na.rm = TRUE),
    Min = min(Value, na.rm = TRUE),
    Max = max(Value, na.rm = TRUE))
```

```
#Age
```

```
unique(Mediation$Age)
```

```
Age1 <- Mediation[Mediation$Age >= 19 & Mediation$Age <= 30, ]
```

```
Age2 <- Mediation[Mediation$Age >= 31 & Mediation$Age <= 40, ]
```

```
Age3 <- subset(Mediation, Age >= 41)

#control mean counts
control_mean_counts <- Online %>%
  group_by(ControlMeanGroup) %>%
  count()

print(control_mean_counts)

#female and male
unique(Mediation$Gender)

female <- Mediation[Mediation$Gender == 2, ]
summary(female)

male <- Mediation[Mediation$Gender == 1, ]
summary(male)

#nationality
unique(Mediation$Nationality)

Canada <- Mediation[Mediation$Nationality == 31, ]
summary(Canada)

Germany <- Mediation[Mediation$Nationality == 65, ]
summary(Germany)

Israel <- Mediation[Mediation$Nationality == 83, ]
summary(Israel)

Japan <- Mediation[Mediation$Nationality == 86, ]
summary(Japan)

Mexico <- Mediation[Mediation$Nationality == 111, ]
```

```
summary(Mexico)
```

```
Netherlands <- Mediation[Mediation$Nationality == 122, ]  
summary(Netherlands)
```

```
Poland <- Mediation[Mediation$Nationality == 137, ]  
summary(Poland)
```

```
Republic_of_Moldova <- Mediation[Mediation$Nationality == 141, ]  
summary(Republic_of_Moldova)
```

```
Russian_Federation <- Mediation[Mediation$Nationality == 143, ]  
summary(Russian_Federation)
```

```
Ukraine <- Mediation[Mediation$Nationality == 183, ]  
summary(Ukraine)
```

```
UK <- Mediation[Mediation$Nationality == 185, ]  
summary(UK)
```

```
#Education
```

```
Primary <- Mediation[Mediation$Education == 1, ]  
summary(Primary)
```

```
Secondary <- Mediation[Mediation$Education == 2, ]  
summary(Secondary)
```

```
Bachelorsdegree <- Mediation[Mediation$Education == 3, ]  
summary(Bachelorsdegree)
```

```
Mastersdegree <- Mediation[Mediation$Education == 4, ]  
summary(Mastersdegree)
```

```
Otheredu <- Mediation[Mediation$Education == 9, ]
```



```
summary(Otheredu)
```

```
#Employment
```

```
Employed <- Mediation[Mediation$Employment == 1, ]
```

```
summary(Employed)
```

```
Student <- Mediation[Mediation$Employment == 3, ]
```

```
summary(Student)
```

```
Otheremp <- Mediation[Mediation$Employment == 6, ]
```

```
summary(Otheremp)
```

```
#Correlation table
```

```
# Extract columns from the Mediation data set
```

```
age_gender <- Mediation[, c("Age", "Gender", "ResponseID")]
```

```
control_variable <- Mediation [, c("ResponseID", "ControlQuestion_Empathize_Scenario",
```

```
"ControlQuestion_imagine_being_offender",
```

```
"ControlQuestion_empathize_with_feelings_of_offender",
```

```
"ControlQuestion_empathize_with_thoughts_of_offender",
```

```
"ControlQuestion_answer_questions_seriously",
```

```
"ControlQuestion_read_scenarios_thoroughly",
```

```
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
```

```
"ControlQuestion_motivation_during_this_study")]
```

```
control_variable$ControlMean <- rowMeans(control_variable[,
```

```
c("ControlQuestion_Empathize_Scenario", "ControlQuestion_imagine_being_offender",
```

```
"ControlQuestion_empathize_with_feelings_of_offender",
```

```
"ControlQuestion_empathize_with_thoughts_of_offender",
```

```
"ControlQuestion_answer_questions_seriously",
```

```
"ControlQuestion_read_scenarios_thoroughly",
```

```
"ControlQuestion_feel_confident_to_act_as_naturalistic_as_you_would_real_life",
```

```
"ControlQuestion_motivation_during_this_study"]), na.rm = TRUE)
```

```
# Extract columns for empathy total
```

```

empathy_total <- Mediation [, c("ResponseID", "CognitiveWorriedOnline",
"CognitiveSadOnline", "CognitiveUpsetinsideOnline", "CognitiveDistressedOnline",
"CognitiveSorryOnline", "CognitiveDisturbedOnline", "CognitiveAngryOnline",
"CognitiveDisgustedOnline", "CognitiveFrightenedOnline", "CognitiveThrilledOnline",
"CognitiveInterestedOnline", "CognitiveHappyOnline", "CognitiveExcitedOnline",
"AffectiveWorriedOnline", "AffectiveSadOnline", "AffectiveUpsetinsideOnline",
"AffectiveDistressedOnline", "AffectiveSorryOnline", "AffectiveDisturbedOnline",
"AffectiveAngryOnline", "AffectiveDisgustedOnline", "AffectiveFrightenedOnline",
"AffectiveThrilledOnline", "AffectiveInterestedOnline", "AffectiveHappyOnline",
"AffectiveExcitedOnline", "CognitiveWorriedF2F", "CognitiveSadF2F",
"CognitiveUpsetinsideF2F", "CognitiveDistressedF2F", "CognitiveSorryF2F",
"CognitiveDisturbedF2F", "CognitiveAngryF2F", "CognitiveDisgustedF2F",
"CognitiveFrightenedF2F", "CognitiveThrilledF2F", "CognitiveInterestedF2F",
"CognitiveHappyF2F", "CognitiveExcitedF2F", "AffectiveWorriedF2F", "AffectiveSadF2F",
"AffectiveUpsetinsideF2F", "AffectiveDistressedF2F", "AffectiveSorryF2F",
"AffectiveDisturbedF2F", "AffectiveAngryF2F", "AffectiveDisgustedF2F",
"AffectiveFrightenedF2F", "AffectiveThrilledF2F", "AffectiveInterestedF2F",
"AffectiveHappyF2F", "AffectiveExcitedF2F")]
empathy_total$TotalMean <- rowMeans(empathy_total[, c("CognitiveWorriedOnline",
"CognitiveSadOnline", "CognitiveUpsetinsideOnline", "CognitiveDistressedOnline",
"CognitiveSorryOnline", "CognitiveDisturbedOnline", "CognitiveAngryOnline",
"CognitiveDisgustedOnline", "CognitiveFrightenedOnline", "CognitiveThrilledOnline",
"CognitiveInterestedOnline", "CognitiveHappyOnline", "CognitiveExcitedOnline",
"AffectiveWorriedOnline", "AffectiveSadOnline", "AffectiveUpsetinsideOnline",
"AffectiveDistressedOnline", "AffectiveSorryOnline", "AffectiveDisturbedOnline",
"AffectiveAngryOnline", "AffectiveDisgustedOnline", "AffectiveFrightenedOnline",
"AffectiveThrilledOnline", "AffectiveInterestedOnline", "AffectiveHappyOnline",
"AffectiveExcitedOnline", "CognitiveWorriedF2F", "CognitiveSadF2F",
"CognitiveUpsetinsideF2F", "CognitiveDistressedF2F", "CognitiveSorryF2F",
"CognitiveDisturbedF2F", "CognitiveAngryF2F", "CognitiveDisgustedF2F",
"CognitiveFrightenedF2F", "CognitiveThrilledF2F", "CognitiveInterestedF2F",
"CognitiveHappyF2F", "CognitiveExcitedF2F", "AffectiveWorriedF2F", "AffectiveSadF2F",
"AffectiveUpsetinsideF2F", "AffectiveDistressedF2F", "AffectiveSorryF2F",
"AffectiveDisturbedF2F", "AffectiveAngryF2F", "AffectiveDisgustedF2F",

```

```
"AffectiveFrightenedF2F", "AffectiveThrilledF2F", "AffectiveInterestedF2F",
"AffectiveHappyF2F", "AffectiveExcitedF2F"), na.rm = TRUE)
```

```
# Extract columns for cognitive empathy
```

```
cognitive_empathy <- Mediation [, c("ResponseID", "CognitiveWorriedOnline",
"CognitiveSadOnline", "CognitiveUpsetinsideOnline", "CognitiveDistressedOnline",
"CognitiveSorryOnline", "CognitiveDisturbedOnline", "CognitiveAngryOnline",
"CognitiveDisgustedOnline", "CognitiveFrightenedOnline", "CognitiveThrilledOnline",
"CognitiveInterestedOnline", "CognitiveHappyOnline", "CognitiveExcitedOnline",
"CognitiveWorriedF2F", "CognitiveSadF2F", "CognitiveUpsetinsideF2F",
"CognitiveDistressedF2F", "CognitiveSorryF2F", "CognitiveDisturbedF2F",
"CognitiveAngryF2F", "CognitiveDisgustedF2F", "CognitiveFrightenedF2F",
"CognitiveThrilledF2F", "CognitiveInterestedF2F", "CognitiveHappyF2F",
"CognitiveExcitedF2F")]
```

```
cognitive_empathy$CognitiveMean <- rowMeans(cognitive_empathy[,
c("CognitiveWorriedOnline", "CognitiveSadOnline", "CognitiveUpsetinsideOnline",
"CognitiveDistressedOnline", "CognitiveSorryOnline", "CognitiveDisturbedOnline",
"CognitiveAngryOnline", "CognitiveDisgustedOnline", "CognitiveFrightenedOnline",
"CognitiveThrilledOnline", "CognitiveInterestedOnline", "CognitiveHappyOnline",
"CognitiveExcitedOnline", "CognitiveWorriedF2F", "CognitiveSadF2F",
"CognitiveUpsetinsideF2F", "CognitiveDistressedF2F", "CognitiveSorryF2F",
"CognitiveDisturbedF2F", "CognitiveAngryF2F", "CognitiveDisgustedF2F",
"CognitiveFrightenedF2F", "CognitiveThrilledF2F", "CognitiveInterestedF2F",
"CognitiveHappyF2F", "CognitiveExcitedF2F"), na.rm = TRUE)
```

```
# Extract columns for affective empathy
```

```
affective_empathy <- Mediation [, c("ResponseID", "AffectiveWorriedOnline",
"AffectiveSadOnline", "AffectiveUpsetinsideOnline", "AffectiveDistressedOnline",
"AffectiveSorryOnline", "AffectiveDisturbedOnline", "AffectiveAngryOnline",
"AffectiveDisgustedOnline", "AffectiveFrightenedOnline", "AffectiveThrilledOnline",
"AffectiveInterestedOnline", "AffectiveHappyOnline", "AffectiveExcitedOnline",
"AffectiveWorriedF2F", "AffectiveSadF2F", "AffectiveUpsetinsideF2F",
"AffectiveDistressedF2F", "AffectiveSorryF2F", "AffectiveDisturbedF2F",
"AffectiveAngryF2F", "AffectiveDisgustedF2F", "AffectiveFrightenedF2F",
```

```

"AffectiveThrilledF2F", "AffectiveInterestedF2F", "AffectiveHappyF2F",
"AffectiveExcitedF2F")]
affective_empathy$AffectiveMean <- rowMeans(affective_empathy[,
c("AffectiveWorriedOnline", "AffectiveSadOnline", "AffectiveUpsetinsideOnline",
"AffectiveDistressedOnline", "AffectiveSorryOnline", "AffectiveDisturbedOnline",
"AffectiveAngryOnline", "AffectiveDisgustedOnline", "AffectiveFrightenedOnline",
"AffectiveThrilledOnline", "AffectiveInterestedOnline", "AffectiveHappyOnline",
"AffectiveExcitedOnline", "AffectiveWorriedF2F", "AffectiveSadF2F",
"AffectiveUpsetinsideF2F", "AffectiveDistressedF2F", "AffectiveSorryF2F",
"AffectiveDisturbedF2F", "AffectiveAngryF2F", "AffectiveDisgustedF2F",
"AffectiveFrightenedF2F", "AffectiveThrilledF2F", "AffectiveInterestedF2F",
"AffectiveHappyF2F", "AffectiveExcitedF2F")], na.rm = TRUE)

# Combine all the extracted columns into a single data frame
correlation_df <- cbind(age_gender, control_variable, empathy_total, cognitive_empathy,
affective_empathy)

correlation_df$Age <- as.numeric(correlation_df$Age)
correlation_df$Gender <- as.numeric(correlation_df$Gender)
correlation_df$ControlMean <- as.numeric(correlation_df$ControlMean)
correlation_df$TotalMean <- as.numeric(correlation_df$TotalMean)
correlation_df$CognitiveMean <- as.numeric(correlation_df$CognitiveMean)
correlation_df$AffectiveMean <- as.numeric(correlation_df$AffectiveMean)

correlation_df <- correlation_df[, c("Age", "Gender", "ControlMean", "TotalMean",
"CognitiveMean", "AffectiveMean")]

# Calculate the correlation matrix without NAs
correlation_matrix <- cor(correlation_df, use = "complete.obs")

# Print the correlation matrix
print(correlation_matrix)

# Create an empty matrix to store the p-values

```

```
p_values <- matrix(NA, nrow = ncol(correlation_matrix), ncol = ncol(correlation_matrix))

# Loop through each pair of variables
for (i in 1:(ncol(correlation_matrix) - 1)) {
  for (j in (i + 1):ncol(correlation_matrix)) {
    # Extract the variables for correlation test
    var1 <- correlation_matrix[, i]
    var2 <- correlation_matrix[, j]

    # Remove rows with NA values for the correlation test
    na_indices <- is.na(var1) | is.na(var2)
    var1 <- var1[!na_indices]
    var2 <- var2[!na_indices]

    # Perform the correlation test and store the p-value
    result <- cor.test(var1, var2)
    p_values[i, j] <- result$p.value
    p_values[j, i] <- result$p.value
  }
}

# Print the p-values
print(p_values)

# Calculate the means of each variable
means <- colMeans(correlation_df, na.rm = TRUE)

# Calculate the standard deviations of each variable
sds <- apply(correlation_df, 2, sd, na.rm = TRUE)

# Print the means and standard deviations
print(means)
print(sds)
```

```
#Linear Regression Cognitive
# Add a condition variable to each dataset
OnlineC_long$Condition <- "Online"
F2FC_long$Condition <- "Face-to-Face"
# Combine the separate datasets
combined_data <- rbind(OnlineC_long, F2FC_long)

# Fit a linear regression model
model <- lm(Value ~ Condition, data = combined_data)

# Print the summary of the regression model
summary(model)

#Linear Regression Affective
# Add a condition variable to each dataset
OnlineA_long$Condition <- "Online"
F2FA_long$Condition <- "Face-to-Face"
# Combine the separate datasets
combined_data <- rbind(OnlineA_long, F2FA_long)

# Fit a linear regression model
model <- lm(Value ~ Condition, data = combined_data)

# Print the summary of the regression model
summary(model)

#Linear Regression Total
# Add a condition variable to each dataset
Online_long$Condition <- "Online"
F2F_long$Condition <- "Face-to-Face"
# Combine the separate datasets
combined_data <- rbind(Online_long, F2F_long)
```

```

# Fit a linear regression model
model <- lm(Value ~ Condition, data = combined_data)

# Print the summary of the regression model
summary(model)

#T-Test1 Cognitive
VERACognitiveF2F <- VERACognitiveF2F %>%
  mutate(CognitiveHappyF2F = desc(CognitiveHappyF2F),CognitiveExcitedF2F =
desc(CognitiveExcitedF2F))

MeansVERACognitiveF2F <- VERACognitiveF2F %>%
  select(-ResponseID) %>%
  rowwise() %>%
  mutate(mean_value = mean(c_across(where(is.numeric)))) %>%
  ungroup()
MeansVERACognitiveF2F <- cbind(VERACognitiveF2F["ResponseID"],
MeansVERACognitiveF2F["mean_value"])

VERACognitiveOnline <- VERACognitiveOnline %>%
  mutate(CognitiveHappyOnline = desc(CognitiveHappyOnline),CognitiveExcitedOnline =
desc(CognitiveExcitedOnline))

MeansVERACognitiveOnline <- VERACognitiveOnline %>%
  select(-ResponseID) %>%
  rowwise() %>%
  mutate(mean_value = mean(c_across(where(is.numeric)))) %>%
  ungroup()

MeansVERACognitiveOnline <- cbind(VERACognitiveOnline["ResponseID"],
MeansVERACognitiveOnline["mean_value"])

```

```

# Perform paired t-test between MeansVERACognitiveOnline and
MeansVERACognitiveF2F
ttest_result <- t.test(MeansVERACognitiveOnline$mean_value,
MeansVERACognitiveF2F$mean_value, paired = TRUE)

# Print the t-test results
print(ttest_result)

#T-Test2 Affective
MeansVERAAffectiveF2F <- VERAAffectiveF2F %>%
  select(-ResponseID) %>%
  rowwise() %>%
  mutate(mean_value = mean(c_across(where(is.numeric)))) %>%
  ungroup()
MeansVERAAffectiveF2F <- cbind(VERAAffectiveF2F["ResponseID"],
MeansVERAAffectiveF2F["mean_value"])

VERAAffectiveOnline <- VERAAffectiveOnline %>%
  mutate(AffectiveHappyOnline = desc(AffectiveHappyOnline),AffectiveExcitedOnline =
desc(AffectiveExcitedOnline))

MeansVERAAffectiveOnline <- VERAAffectiveOnline %>%
  select(-ResponseID) %>%
  rowwise() %>%
  mutate(mean_value = mean(c_across(where(is.numeric)))) %>%
  ungroup()

MeansVERAAffectiveOnline <- cbind(VERAAffectiveOnline["ResponseID"],
MeansVERAAffectiveOnline["mean_value"])

# Perform paired t-test between MeansVERACognitiveOnline and
MeansVERACognitiveF2F

```



```

ttest_result <- t.test(MeansVERAAffectiveOnline$mean_value,
MeansVERAAffectiveF2F$mean_value, paired = TRUE)

# Print the t-test results
print(ttest_result)

#T-Test3 Total
MeansVERATotalF2F <- merge(MeansVERACognitiveF2F, MeansVERAAffectiveF2F, by
= "ResponseID")
MeansVERATotalF2F$total_mean_value <- (MeansVERATotalF2F$mean_value.x +
MeansVERATotalF2F$mean_value.y) / 2

# Remove the mean_value.x and mean_value.y columns
MeansVERATotalF2F <- MeansVERATotalF2F %>%
  select(ResponseID, total_mean_value)

MeansVERATotalOnline <- merge(MeansVERACognitiveOnline,
MeansVERAAffectiveOnline, by = "ResponseID")
MeansVERATotalOnline$total_mean_value <- (MeansVERATotalOnline$mean_value.x +
MeansVERATotalOnline$mean_value.y) / 2

# Remove the mean_value.x and mean_value.y columns
MeansVERATotalOnline <- MeansVERATotalOnline %>%
  select(ResponseID, total_mean_value)

# Perform paired t-test between MeansVERACAffectiveOnline and
MeansVERAAffectiveF2F
ttest_result <- t.test(MeansVERATotalOnline$total_mean_value,
MeansVERATotalF2F$total_mean_value, paired = TRUE)

# Print the t-test results
print(ttest_result)

```

```
# Calculate the standard deviation, ignoring missing values
```

```
onlineC_sd <- sd(OnlineC_long$Value, na.rm = TRUE)
```

```
f2fC_sd <- sd(F2FC_long$Value, na.rm = TRUE)
```

```
# Calculate the standard deviation, ignoring missing values
```

```
onlineA_sd <- sd(OnlineA_long$Value, na.rm = TRUE)
```

```
f2fA_sd <- sd(F2FA_long$Value, na.rm = TRUE)
```

```
# Calculate the standard deviation, ignoring missing values
```

```
online_sd <- sd(Online_long$Value, na.rm = TRUE)
```

```
f2f_sd <- sd(F2F_long$Value, na.rm = TRUE)
```