Bachelor Thesis: Practicing VOM in VR – Predictors of the Intention to Use VR

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Abstract

The study deals with factors predicting the Use of Virtual Reality (VR) as preparation for Victim-offender Mediation (VOM). It is useful in order to remove occurring insecurities about the process and feelings of anger and anxiety. Factors are taken from the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB). Additionally, the factors knowledge and involvement with VR and personal innovativeness in the domain of technology are tested which were included in neither TAM nor TPB. It was part of the research to find out if those factors predict the intention to use VR to get acquainted with VOM, as limited knowledge about this specific topic is known so far. The factors perceived ease of use, perceived behavioural control, perceived usefulness, personal innovativeness and knowledge and involvement of the user were expected to predict the intention to use VR to get acquainted with VOM. Furthermore, an interaction effect with anxiety and anger was predicted. An online survey was conducted with students and people from the researcher's network (N=110). An imaginary crime scenario was presented to them, and they were introduced to the VR application. Afterward, they had to answer questions regarding their opinion on this technology and their intention to use the VR application and intention to participate in VOM in general. Results were in line with the expectations, perceived ease of use of the VR application, perceived usefulness of the VR application and personal innovativeness in the domain of technology are positive predictors for the intention to use VR to get acquainted with VOM. However, perceived behavioural control of the VR application and knowledge and involvement with VR were no predictors. An interaction effect between the knowledge and involvement and Anger and was found. A revision of the study by actually using VR would be useful to complement other studies and add to the further development of VOM as proper preparation is an important factor for sufficient participation in the process.

Keywords: VR TAM VOM

Already in the 1970s, many criminal justice systems offered opportunities regarding restorative justice (RJ), which gave victims and offenders the possibility to have voluntary contact together with a mediator who supports and leads the conversation (Hansen & Umbreit, 2018). RJ defines a process which focuses on the victim, offender, and the surrounding community instead of simply punishing the offender (Zehr, 2015). It should lead to a more sustainable outcome (Zehr, 2015. One form of restorative justice is called Victim-Offender Mediation (VOM) (Zebel, Schreurs, & Ufkes, 2017).

VOM is useful to help victims to meet the offender in a secure and organized environment, in which the offender is made accountable for his/her behaviour (Umbreit, Coates, & Vos, 2004). VOM reduced the chance of reoffending in cases, in which both victim and offender were willing to meet each other for mediation (Sherman, Strang, Mayo-Wilson, Woods, & Ariel, 2015). Sherman et al. (2015) even made clear that Victim-offender conferencing is applicable in both minor assaults and mayor assault, as especially in more emotional and more violent crimes (compared to property crimes), the effect size of restorative justice increased, and the higher intensity of the process could reduce recidivism. As conferencing and mediation have some similarities, those findings could also be used for VOM. The positive effects for both victim and offender which are resulting from VOM are, therefore, for example, the emotional restoration of the crime and also a decreasing danger of reoffending (Zebel et al., 2017).

Also, it is possible to restore the victim's sense of justice during mediation, and the possibility is given to reach a certain degree of safety. Thus, the victim can deal with the crime happened appropriately (Paul & Schenck-Hamlin, 2017). In addition, it can be assumed that the offender can compensate for his behaviour in an emotional and a material manner as it is common that VOM causes a restitution agreement or an apology (Hansen & Umbreit, 2018). According to research, over 90% of VOM sessions result in a restitution agreement (Umbreit et al., 2004). The process itself facilitates closure and an open conversation about what has happened. The victim might have the desire to cope with the experience, move on, and the uncertainty about the situation through, e.g., social support can be decreased (Paul & Schenck-Hamlin, 2017). Needs of victims might differ, and the experiences might require different approaches.

Overall, the responses to VOM are positive, as mediation leads to mutual agreements in 70% of the cases in the Netherlands (Doorverwijzen., n.d.). Furthermore, Hansen & Umbreit (2018) found out that in the Netherlands 70%-80% of the victims who took part in a

restorative justice process received an apology and the minority stated that they felt worse after taking part (6-10%).

However, responses to VOM are not necessarily positive, always. Daly (2006) declares that to conduct VOM, a set of ideals about justice based on empathy and generosity has to be established. Additionally, it is not generalised which practices are part of the restorative justice process, and it is difficult to define restorative justice. Therefore, responses can differ as it might also be difficult to adapt the procedure to all the different kinds of cases (Daly, 2006; Choi, Green, & Kapp, 2010). As victims might expect a different behaviour of the offender, the disappointment of an unfulfilled expectation could lead to a negative outcome of the process; reasons for this could be missing preparation for example (Daly, 2006; Choi et al., 2010). The overall process is limited by the abilities and interests of the offender and the victim. Insensitive treatment of the victim might lead to feelings of guilt of the victim. The victim might not show its true emotions and it should be prevented that he/she is pressured or intimidated by the mediator, the offender or relatives (Choi et al., 2010; Choi, Gilbert, & Green, 2013). Therefore, it is unclear if either restorative justice or conventional justice leads to a better outcome, and further research is needed at this point (Sherman et al., 2015). Although Hansen & Umbreit (2018) revealed that VOM is broadly effective, more recent research has to be conducted, to get a new impression of the positive aspects for victim and offender and the cost-effectiveness.

For example, it can be argued that it is needed to define factors influencing the participation of victims, as the process can be adapted to those predictors, and more people might decide to take part (Wyrick & Constanzo, 1999). Therefore, it is necessary that participation is voluntarily, and participants should not be manipulated or forced to take part in VOM as this could impact the process negatively (Paul & Schenck-Hamlin, 2017). Hansen & Umbreit (2018) show that voluntariness is needed in order to ensure that the process is victim-centered. The needs of the victims have to be researched, as they might be of emotional and informal nature and can positively impact the victim's further coping with the crime, while for the offender it might cause less criminal behaviour in the future by focusing on both victim's and offender's needs (Umbreit et al., 2004). The information about the needs of the victim and offender can promote participation and adopt the process towards those needs.

Even though the participation rates are rising, participation rates of victims are just in the range between 40 and 60 percent (Hansen & Umbreit, 2018). Participants often consider the mediation process as helpful, and rates of reoffending decrease (Umbreit et al., 2004).

Also, levels of anxiety can be removed during the process (Doorverwijzen., n.d.). Therefore, further effort should be made to promote this kind of restorative justice and define predictors to participate. Additionally, other support can be useful to prepare the victim for the process, as other factors can prevent the victim from not taking part. Those factors need to be targeted and solved to promote easy participation. For example, Paul and Schenck-Hamlin (2017) found out that some victim-related factors that hinder participation are uncertainty about the process, including being nervous or angry (inability to control emotions). Also, anxiety can be assumed to be a factor preventing victims from taking part as they are still emotionally unstable due to the crime (Paul & Schenck-Hamlin, 2017). Another important stressor is that feelings of anger and isolation might cause the need for social support and therefore, the process would be needed in order to promote closure and restoration (Paul & Schenck-Hamlin, 2017; Hansen & Umbreit, 2018; Choi et al., 2010). Hansen & Umbreit (2018) found out that common reasons to not participate were that the crime seems too trivial to invest time, fear, that the victim preferred a harder punishment for the offender and also, a long time gap after the crime provided as a reason for not participating. The negative points should be discussed and the development of VOM should be accelerated.

Insecurities might exist about the process itself as victims might be badly prepared regarding the procedure and the possible outcomes (Daly, 2006; Choi et al., 2010). Therefore, unachievable hopes and expectations might lead to disappointment (Hansen & Umbreit, 2018). Also, it is possible that the victim is pressured to agree or had the feeling that emotional expressions are not accepted, and those hinder them from benefiting from the process (Hansen & Umbreit, 2018). Thus, an in-person preparation for the mediation would be useful to discuss the concerns and emotions of the victim, as lack of preparation might impact the victim negatively (Hansen & Umbreit, 2018; Choi et al., 2010). This meeting would be between the mediator and the victim and hopes, expectations, fears, and voluntariness can be discussed (Hansen & Umbreit, 2018). Additionally, the individual competence of the mediator is important to lead a sensitive and efficient process with good mediation outcomes (Choi et al., 2010).

As costs for the process might occur as an issue, cost-effectivity needs to be targeted by searching for innovative ways to prepare the victim for the mediation process. One idea would be the use of new technologies as Virtual Reality (VR). VR describes a simulated interactive environment (Shen, Ho, Ly, & Kuo, 2018). While using VR, the user can explore an imaginary situation, and the understanding of otherwise unobservable circumstances might be facilitated (Shen et al., 2018).

VR is already commonly used in the context of psychotherapy. VR was established in the past years as a tool for the assessment and management of psychological disorders (Srivastava, Das, & Chaudhury, 2014). It is useful to learn new skills which can be applied afterward in the real world. Thus, VR can be described as an interactive, three dimensional and computer-generated environment which can focus, as it would be useful in the context of VOM, on interaction (Srivastava et al., 2014).

Furthermore, Riva (2005) makes clear that VR has as a main advantage that the user can interact with the interface and that a naturalistic environment is created, which the user is part of. Also, similar to real-life conditions, different inputs and data sets can be collected and integrated into the VR application (Riva, 2005). In the context of psycho-therapeutic treatment the problematic, for example, anxiety related situation can be created artificially, and the patient is feeling more secure than directly being confronted with the feared stimulus and can show feelings and thoughts and discuss them with a (e.g.) supervisor (Riva, 2005). In that way the needs of the victim could be targeted successfully or perhaps more specifically, and VR can support a stable atmosphere and promote responsible dealing with the situation (Riva, 2005). By using technology in the clinical context, the treatment of diverse mental problems is possible, e.g. anxiety disorders, specific phobias, and fears. Therefore, there is the possibility that also feelings of anxiety before VOM could be decreased through VR, and the victim could be prepared sufficiently for the process.

According to research, feelings of anxiety in Post-Traumatic-Stress-Disorders could be reduced through VR treatment, and symptoms of anxiety were lowered (Rothbaum et al., 2001). The patient can be exposed to the causing stimulus, and a realistic situation is created (Jerdan, Grindle, van Woerden & Boulos, 2018). Realistic reactions to the feared stimulus can be induced and both audio and interactive visual stimuli enhance a realistic situation. Thus, also CBT showed positive results for patients suffering from problematic psychological behaviour (Jerdan et al., 2018). VR serves as an alternative for exposure therapy, where the patient is confronted with the feared stimulus instead of avoiding it. This is supposed to decrease the level of anxiety (Riva, 2005). VR is aimed to be more controlled and cost-effective (Riva, 2005). Also, VR showed positive results as exposure therapy in most of the cases (Jerdan et al., 2018). In Anxiety and Phobia treatment VR is already used in Virtual Reality Exposure Therapy (VRET), in which the victim is confronted with the stimulus which he/she is afraid of in a virtual environment (Parsons & Rizzo, 2008). The therapy is helpful and negative affective symptoms are lowered, while anxiety and phobia symptoms are reduced in VRET (Parsons & Rizzo, 2008).

However, Srivastava et al. (2014) mention that VR is rather expensive and therefore, ways have to be established in order to integrate it in the therapeutic setting. The barrier has to be targeted. Also, some patients suffered from VR-induced sickness and therefore, it might not be applicable for everyone (Srivastava et al., 2014). Still, Riva (2005) views this as rather mild for the majority of patients. Due to the positive effect of VR on phobias to treat anxiety, it can be concluded that VR might also lower the fear of the victim to participate in VOM. The component fear is perceived as one of the strongest inhibitors to take part in the process as it was found out in the study of Paul & Schenck-Hamlin (2017). However, also other factors might hinder the victim from taking part in VOM. Still, VR could be a good overall preparation, which would also target the uncertainty about the process (Paul & Schenck-Hamlin, 2017). As VR promotes the confrontation with strong emotions, it can be concluded that it would also be useful to deal with feelings of anger. It can be assumed that VR is helpful in coping with anger, as it was used in CBT where the patients were exposed to a stimulus which caused feelings of anger and thereby, anger management was trained (Miyahira, Folen, Stetz, Rizzo, & Kawasaki, 2010).

The VR application can be tailored to the victim, and the victim can envision the situation better and might feel less nervous and better prepared due to the safe environment and the support through an expert. Furthermore, VR seems more applicable than other kinds of preparation as through VR the case can be set in a safe environment, situations which are hard to implement in real life can be reproduced (Pan & Hamilton, 2018). It can be assumed that through the safe setting, it might be easier for the victims to take part in VR, instead of taking directly part in VOM. Also, because victims might not want to take part in VOM due to different inhibiting reasons, VR could prepare them sufficiently to get acquainted with VOM.

Still, research needs to be done on the predictors to use VR, as it might be another challenge to convince victims to use a new kind of technology to prepare for VOM. In the study of Garcia-Palacios, Hoffman, Kwong See, Tsai, & Botella (2001), patients were more likely to use VR treatment over invivo exposure, being directly exposed to real-world conditions, the stronger the fear against the stimulus was, and the number of patients who refused to take part was lower for VR than for invivo. This could be transferred to VR in VOM, as victims with a higher amount of fear are possibly more likely to take part in VR, as they are not meeting the offender directly. Thus, there might also be the possibility that people do not want to take part in VOM and therefore, also do not see the need to take part in VR.

Therefore, the intervention might be more successful as a preparation for people who are unsure about participating and would like to get acquainted with VOM.

Based on the explanation about the usefulness of VR to prepare for VOM, predicting factors should be explored which promote the victim's participation in VR. Therefore, several theories are used, and predictors are extracted which shall be tested in the current thesis.

The Theory of Planned Behaviour (TPB) by Ajzen (1991) was used, and the component Perceived Behavioural Control was used as a predictor in further analyses (Venkatesh, Morris, Davis, & Davis, 2003). The model is used to predict intention and presume behaviour in different settings and defines individual acceptance and usage of different technologies (Venkatesh et al., 2003). It consists of the components Attitude, Subjective Norm and Perceived Behavioural Control, of which Perceived Behavioural Control is used to describe the perceived ease or difficulty in the performance of a behaviour (Venkatesh et al., 2003). This includes also occurring perceived problems when carrying out the desired behaviour (Venkatesh et al., 2003). Therefore, it can be assumed that it could be an important predictor for the willingness to use VR to get acquainted with VOM due to the definition of intentions and presumed behaviour, in the domain of technologies.

The second model used is the Technology Acceptance Model (TAM) by Davis (1989), which serves to find factors facilitating the use of technology. As Venkatesh et al. (2003) say, it is used to predict information technology acceptance and usage and should define occurring intentions. Furthermore, it should be a theoretical model which explains the usage behaviours in the implementation of information systems, while the attitude is excluded and it is focused on intentions (Legris, Ingham, & Colerette, 2001). It includes the factors perceived usefulness, perceived ease of use, and subjective norm (Legris et al., 2001). Based on this model, the predictors perceived ease of use (TAM) and perceived usefulness are chosen. Perceived ease of use is described by Venkatesh and Davis (1996) as the degree to which a particular system can be used without significant effort, while the predictor perceived usefulness (TAM) describes how a person perceives the enhancement of a particular system on one's (job)performance and to which amount an information system would increase one's Job performance (Davis, 1989; Venkatesh et al., 2003). The predictors can be adapted to the use of VR (in research TAM focuses on information systems) and therefore, can be useful for the following research due to its universal application. This was done by Fagan, Kilmon & Pandey (2012) who used the TAM in the context of implementing a VR simulation for nursing students and found out that perceived ease of use and perceived usefulness predicted students' participation in VR.

The third predictor is taken from the User Information satisfaction (UIS) model (Treacy, 1985). Compared to the other models, it is less popular. Knowledge and involvement of the user are one factor of UIS, together with staff and services, the quality of the information product (Treacy, 1985). UIS is seen as useful to look at measuring computer system's success or failure and how the information meets the individual expectations towards information (Treacy, 1985). Additionally, it is said that user satisfaction is an important criterion to define a computer systems assessment (Powers & Dickson, 1973). As knowledge and involvement of the user are crucial for user satisfaction it is used in the current thesis. Even though it is rather old and focused on computers, due to its broad description, it can be easily adapted to VR.

Finally, personal innovativeness explains connections in TAM (Agarwal & Prasad, 1998). It is used to define individuals innating the trait who can perform information technology innovations earlier compared to others (Agarwal & Prasad, 1998). Therefore, it is useful for the process of adopting new information and technology, and it can be an essential predictor for the use of VR (Fagan et al., 2012).

As more serious crimes caused more intense emotions, it should be tested if feelings as anxiety or anger might have an impact on the relationship between the predictors and the willingness to participate in VR as preparation for VOM (Sherman et al.,2015). Furthermore, research showed that high distress would make the possibility more likely that the victim would remain angry and fearful after the process (Daly, 2006). Victims who do not suffer from crime as sincerely might be more easily be convinced to take part in VR to get acquainted with VOM (Daly, 2006). Thus, it should be tested if feelings of anxiety or anger inhibit the intention to participate. It can be assumed in line with Miyahira et al. (2010) that VR is useful to cope with feelings of anger and therefore, it should be tested how anger impacts the intention to participate in VR. Due to the positive impact of VR on anxiety treatment, victims might be more likely to have the intention to participate in VR when feelings of anxiety occur than participating directly in VOM. However, it could be assumed that feelings of anxiety could impact the relationship negatively as anxiety might hinder victims in taking part due to their anxiety towards the offender.

Therefore, the following research question is developed "To what extent can factors of the TAM and TPB, UIS and personal innovativeness be used to predict whether crime victims will participate in VR to get acquainted with VOM and how do the emotions anger and anxiety moderate this relationship?". Based on the just mentioned following hypotheses are predicted:

I. Perceived Ease of Use of the VR application about VOM positively predicts the victim's intention to use VR to get acquainted with VOM.

II. Perceived Behavioural Control of the VR application about VOM positively predicts the intention to use VR to prepare for VOM.

III. Perceived Usefulness of the VR application about VOM positively predicts the intention to use VR to prepare for VOM.

IV. Knowledge and involvement with VR of the user positively predicts the intention to use VR.

V. Personal innovativeness in the domain of technology positively predicts the intention to use VR to prepare for VOM.

VI. The variables anxiety and anger influence the relationship between the independent variables and the dependent variables negatively (moderation).

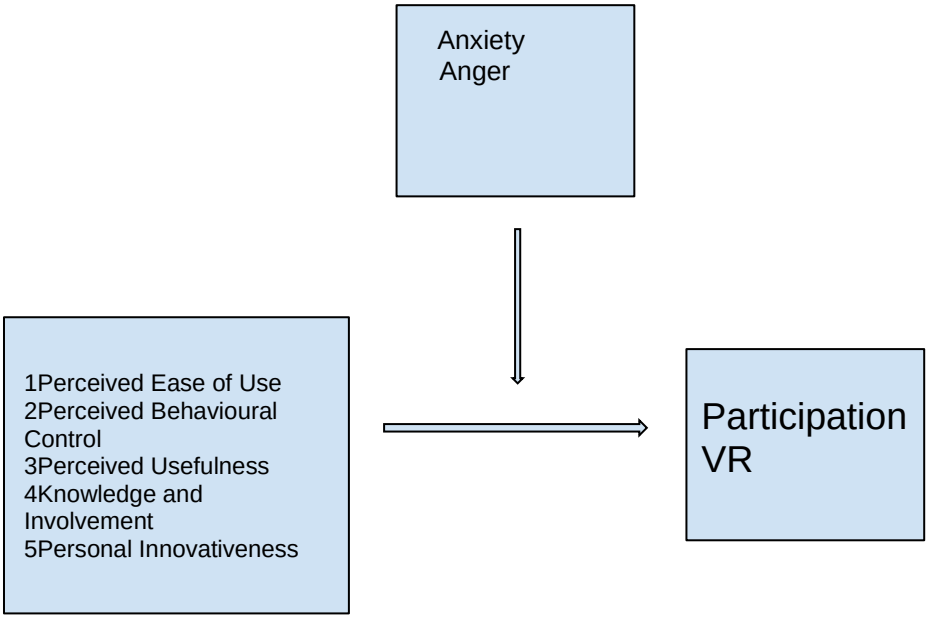

Figure 1. Figure to display the assumed relationship between the independent variables and the dependent variable intention to use VR, including the moderator's anxiety and anger. Participation VR refers in this case to the dependent variable intention to use VR to get acquainted with VOM.

Method

Design

To examine the predictors for using VR to prepare for VOM, a correlational survey study was conducted. The dependent variable is the intention to use VR to get acquainted with VOM. Five predictors are tested which are perceived ease of use of the VR application, perceived behavioural control of the VR application, perceived usefulness of the VR application, knowledge and involvement with VR of the user and personal innovativeness in the domain of technology. Furthermore, anxiety and anger are used as moderators to explain these relationships.

Participants

The study included a sample of 111 participants from the researcher's network and students from the University of Twente who took part via SONA.[1] The analyses were conducted with 110 of the 111 participants. The participants had a mean age of 22.06 (SD=7.12). 27 males (22.7%) and 83 females (75.5%) participated. Furthermore, 91 (82.7%) were German, 12 (10.9%) were Dutch and 7 (6.4%) had a different nationality. Of the 110 participants, 101 were students (91.8%), nine were working (8.2%).

Furthermore, the procedure was explained to the participants in informed consent, in which also the confidentiality of the taken data was ensured. The study was approved by the ethics committee (Faculty of Behavioural, Management and Social Sciences). To find out if the participants took the study seriously and answered the question honestly, three control questions were used at the end of the survey, e.g. "I participated seriously in the study.".

Materials

An online study was conducted by using Qualtrics, including an informed consent.

Crime Scenario. The crime scenario described a situation, in which the participant was on a bus and got attacked by an unknown offender by being insulted, and a beer bottle was thrown towards him. In the end, the participant had to imagine being hit by the bottle. A picture of a bus was included to imagine the situation more easily (Appendix 2).

Information about VOM and VR. It is explained that the offender offered VOM to the victim, two weeks after the crime and the background and purpose of VOM was explained, to introduce the topic to the participant. Especially, the fact that research showed good results for this kind of restorative justice was mentioned (Appendix 3). Furthermore, a

[1] To define the final data set it was checked if there was a different result of the analyses if the one person who gave a 'wrong' answer in the manipulation check (control questions < 4) was excluded. Therefore, different regression analyses were conducted. As no difference based on the significance of the data could be seen, the person was included in the final data set. The other person was excluded due to missing values.

VR application was introduced. The VR application would include an imaginary scenario of a mediation, including a head-mounted device which shows the situation with the mediator and the offender and they are acting based on information from a database based on the suiting kind of scenario to make it as realistic as possible.

Perceived Ease of Use of the VR Application. The predictor perceived ease of use was measured using four items, such as "I think I could use this VR application without consulting the User Manual.". The scale ranged from 1 ("strongly disagree") to 7 ("strongly agree"). The items were taken originally from Davis (1989). However, of the 14 items, four were used and adapted to VR, and a new scale was created measuring perceived ease of use of the VR application. Varimax Rotation indicated an underlying construct which explains 81.08% of the variance. All the items loaded on one component (all loadings >.63, n=110). Based on these findings, reliability was assessed (Perceived Ease of Use; α=.72, Guttman's λ^2=.73).

Perceived Behavioural Control of the VR application. The predictor perceived behavioural control was measured using two items, such as "I think I would be capable of using this VR application about VOM.". The questions were based on Sheeran, Trafimow & Armitage (2003) and adapted to fit into the VR related questionnaire. They were answered on a 7-point-Likert scale (1 "strongly disagree" to 7 "strongly agree"). The two items correlated significantly (r=.62, p<.01, n=110).

Perceived Usefulness of the VR application. The variable perceived usefulness of the VR application consisted of five items in the questionnaire; for example, "Using this VR application would save me time to get information about VOM.". The scale was a 7-point-Likert scale and was created by adapting items of Davis (1989). Five items were created, of which one item (Q9_4) was omitted (to increase reliability). Varimax Rotation showed a variance of 57.56%. All the items loaded strongly on one component (all loadings >.64, n=110). The assessed reliability was α=.74, Guttman's λ^2=.75.

Knowledge and Involvement with VR. Three items were constructed, to measure Knowledge and Involvement with VR of the user, such as "I have the feeling that I already know a lot about VR.". Those questions were based on the UIS model (Treacy, 1985). Participants answered on a scale ranging from 1("strongly disagree") to 7("strongly agree"). Varimax Rotation was used. They loaded on one construct (all loadings >.85, n=110), and 75.54% of the variance can be explained. Reliability was assessed (α=.82, Guttman's λ^2=.83).

Personal Innovativeness in the domain of technology. The predictor personal innovativeness consisted of four items, such as "If I hear about new information technology, I

would look for ways to experiment with it.". The items were taken from Agarwal & Prasad (1998). It was answered on a 7-point-Likert scale. Varimax Rotation showed that two constructs were extracted. Construct 1 had an explained Variance of 57.29%, while construct 2 had an explained variance of 25.15%. Three items loaded on construct 1 (all loadings > .83, n=110), whereas one item loaded on construct 2 (=.996). However, the variable which loaded on construct 2 (Q11_3) was recoded in advance to be able to compare it with the other variables as it was negatively worded. This could be an explanation of why two factors were extracted. Based on these findings, reliability was tested of all items together (α=.65, Guttman's λ^2=.71), and based on this it was decided to include all items in one scale.

Anxiety. Anxiety was measured to be the moderator, and six items were taken from an inventory measuring anxiety and were adapted to fit the current research (Beck, Epstein, Brown & Steer, 1988). An example of an item is "I can imagine feeling unsteady because of the offender.". Like the other items, it had to be answered on a scale ranging from 1 to 7. Varimax Rotation showed one underlying factor (all loadings >.69, n=110) and 68.73% of the variance could be thereby explained. The scale had a reliability of α=.91, Guttman's λ^2=.92.

Anger. The second moderator included four items which were constructed by the researcher, such as "I can imagine feeling angry towards the offender." which was answered on a 7-point-Likert scale. Varimax Rotation was conducted. The variables loaded strongly on one factor (all loadings >.71, n=110), of which 70.57% of the Variance could be explained. Reliability was very good (α=.86, Guttman's λ^2=.87).

Intention to use VR to get acquainted with VOM. To measure the intention to use VR, six items were constructed, but one item (Q14_2) was omitted because the researcher decided that it was formulated to general. One question was for example, "I would participate in this VR application about VOM." The participant's answers were rated on a scale between 1 and 7. Varimax Rotation showed that 63.80% of the variance could be explained by the 1 component. The 5 items loaded strongly on one factor (all loadings >.62, n=110). Reliability was measured (α=.86, Guttman's λ^2=.88).

Intention to participate in VOM. The scale should provide results on the view of the participants towards VOM. The scale had three items, such as "At this point in time, I would accept the mediation proposal of the offender.". Of those items, one item was omitted (Q15_3) (to increase reliability). The items were measured on a scale ranging from 1 to 7. The remaining two items correlated significantly (r=.67, p<.01, n=110).

Behavioural Participation in VR to get acquainted with VOM. In order to measure if participants would like to schedule a meeting with the researcher to try VR, one question

was included which measures the participation in VR. It is a dichotomous variable. And it was asked for their reasons if they indicated 'no'.

Control questions. To find out if the participants took part seriously, three control questions were included, such as "I answered the questions honestly.". The participant's answers were measured on a scale, ranging from 1 to 7. One construct was extracted (all loadings >.71, n=110) using Varimax Rotation which explained 64.91% of the variance. Reliability was tested (α=.68, Guttman's λ^2=.68).

Demographics. The participant was asked to provide information about their demographics, which included age, gender, nationality, and main activity.

Procedure

The study was based on an Online Questionnaire. The participants had to read an informed consent, and by clicking on proceed, they assured their participation (Appendix 1). Afterward, a written crime scenario was presented to the participants. On the next page, it was described that the offender offered VOM to the victim and the procedure was explained further.

Underneath, the participant is also offered to take part in a special VR application to get acquainted with VOM (Appendix 3). This should prepare the participant and answer questions about VOM. Furthermore, the participant is asked to answer some questions afterward and offered to make an appointment with the researcher at the end of the questionnaire, in order to try out this kind of VR application. This information was deception, which was used to make the procedure more realistic and enhance the quality of the self-report.

After the Introductory slides, questions about the independent variables followed (Appendix 4). Those were measured with 18 items on a 7-point-Likert scale. To find out more about the moderators, anxiety was measured using six items, and anger was measured using four items (Appendix 4). To measure the independent variable willingness to participate in VR, six items were included, and additionally, the intention to participate in VOM, in general, was measured with three items (Appendix 5). Then, the question was asked if a meeting with the researcher should be scheduled. Three control questions regarding the seriousness of the participation in the survey followed (Appendix 6). The participant had to choose their demographics. Afterward, it was asked if anything about the VR application remains unclear, and if they answered yes, they were asked to explain what. And they had to report if they also participated in another questionnaire on SONA, which dealt with a similar topic (Appendix 6). In the end, the participant was debriefed, and the deception was explained that no meeting

with the researcher would take place and the purpose of the study that it aims at defining factors facilitating the participation in VR to prepare for VOM was mentioned (Appendix 7).

Results

Descriptives and Correlations

In table 1 it is visible that on the one hand, positive Correlations were found between the variables perceived ease of use of the VR application, perceived behavioural control of the VR application, perceived usefulness of the VR application, personal innovativeness in the domain of technology, knowledge and involvement with VR, intention to participate in VOM, participation in VR (scheduling a meeting) and the dependent variable intention to use VR to get acquainted with VOM. Therefore, if one of those items increases, the intention to use VR to get acquainted with VOM increases as well. Furthermore, positive correlations were found between perceived ease of use of the VR application, perceived behavioural control of the VR application, and the participation in VR. Knowledge and involvement with VR, anxiety, and anger show no significant correlational relationship with the intention to use VR, neither with the participation in VR.

The mean scores showed moderately high values in all the independent variables, except for knowledge and involvement with VR. Participants did not consider themselves as having already a lot of knowledge about VR applications in general but rated their ability to use it as rather high. Also, the crime incident which was described caused high feelings of anxiety and moderately high feelings of anger in the participant. The variables indicated a moderately high intention to use VR to get acquainted with VOM and relatively high interest in the intention to participate in VOM but lower interest in the participation in VR.

Table 1

Descriptives and Correlations of the five Independent Variables and the Dependent Variables (intention and use of VR), Moderators, and the variable intention to participate in VOM.

	M	SD	Range	Min	Max	1	2	3	4	5	6	7	8	9	10
1.Perceived ease of use of the VR application	4.79	.87	5.50	1.50	7.00	1									
2.Perceived behavioural control of the VR application	4.95	1.06	5.00	2.00	7.00	.67*	1								
3.Perceived usefulness of the VR application	5.18	.69	4.50	2.00	6.50	.35 *	.29*	1							
4.Knowledge and Involvement with VR	2.94	1.51	5.67	1.00	6.67	.40*	.30*	.09	1						
5.Personal Innovativeness in the domain of technology	4.23	1.02	4.75	1.50	6.25	.37*	.33*	.17	.32*	1					
6.Anxiety	5.15	1.13	5.00	2.00	7.00	-.32*	-.29*	-.07	-.37*	-.22*	1				
7.Anger	4.79	1.25	5.25	1.75	7.00	-.08	-.01	-.00	-.01	.06	.16	1			
8.Participation VR to get acquainted with VOM	1.23	.42	1	1	2	.32*	.26*	.17	.14	.13	-.15	-.03	1		
9.Intention to participate in VOM	4.64	1.25	5.50	1.00	6.50	.47*	.52*	.30*	.17	.22*	-.25*	-.13	.36*	1	
10.Intention to use VR to get acquainted with VOM	4.36	1.16	5.40	1.20	6.60	.49 *	.42*	.45*	.19	.41*	-.09	.03	.45*	.47*	1

Note. *correlation is significant at the .05 level (2-tailed)

Hypotheses Testing

Both dependent variables were used in the Analyses, measured in two different ways. One was defining the intention to use VR to get acquainted with VOM, the other measured if the participants would participate in VR (behavioural measure).

In order to test which independent variables predict the intention to use VR to get acquainted with VOM, multiple regression analysis was conducted. A significant model was observed. 44% of the variance in the dependent variable can be explained by the predictors. Perceived usefulness of the VR application contributes to the greatest prediction of variance in the dependent variable and age the least. The findings supported the hypotheses that perceived ease of use of the VR application, perceived usefulness of the VR application and personal innovativeness in the domain of technology predicted the intention to use VR to get acquainted with VOM. The variables perceived ease of use (B=.29; p=.04), perceived usefulness (B=.46; p<.001), personal innovativeness (B=.34;p<.001), age (B=.03; p=.01) and the intention to participate in VOM (B=.26; p<.001) are significant predictors for the dependent variable. The other variables were no significant predictors. By looking at the B value, it is visible that the relationship between the predictors is positive. Therefore, if those five variables increase, the willingness to participate does as well. Perceived behavioural control and knowledge and involvement with VR, anxiety, anger, and gender are no significant predictors for the intention to use VR to get acquainted with VOM due to a p-value ≥.05. Therefore, the hypotheses that perceived behavioural control and knowledge and involvement with VR predict the intention to use VR to get acquainted with VOM were rejected.

Table 2

Regression coefficients for the independent variables, the moderator variables, the variable for the intention to participate in VOM as predictors of the intention to use VR to get acquainted with VOM (n=110).

	B	SE	b	p
Perceived ease of use of the VR application	.29	.14	.22	.04
Perceived behavioural control of the VR application	-.03	.11	-.02	.82
Perceived usefulness of the VR application	.46	.14	.27	.00

Knowledge and involvement with VR	.02	.07	.02	.80
Personal innovativeness in the domain of technology	.34	.10	.30	.00
Anxiety	.08	.08	.08	.34
Anger	.05	.07	.05	.49
Gender	.44	.22	.17	.05
Age	.03	.01	.21	.01
Intention to participate in VOM	.26	.08	.29	.00

Note. Model was found to be statistically significant [F(10,99)=9.66; p<.001], with an adjusted RSquare of 0.44.

Further, it was found out that 25 participants (22.7%) wanted to schedule a meeting with the researcher to try out the VR application, and 85 (77.3%) refused to schedule such a meeting. In order to test which impact the independent variables had on this dichotomous variable, participation in VR to get acquainted with VOM was used as a second dependent variable, in order to test if the assumptions from the multiple regression analysis are supported. A logistic regression analysis was used to find the effect of perceived ease of use of the VR application, perceived behavioural control of the VR application, perceived usefulness of the VR application, knowledge and involvement with VR, personal innovativeness in the domain of technology, anxiety, anger, intention to participate in VOM, age, gender on the participation in VR (0= no; 1 = yes). The model explained 37.4% of the variance (NagelkerkeR^2) in the dependent variable. The logistic regression model was statistically significant. The variables intention to participate in VOM and age were significant predictors, *Exp (B)* = 2.41, *p* = .017, and *Exp (B)* = 1.14, *p* = .013, respectively. Therefore, the participants who were willing to participate in VOM were more like to schedule a meeting with the researcher to try out VR and the higher the age, the more likely was the chance to participate in the meeting. None of the other predictors was significant, all *Exp (Bs)* between .80 and 2.19, *ps* >.14.

By comparing both the logistic regression analysis and the multiple regression analysis, different results can be seen. In the logistic model, age and intention to participate in VOM are extracted as Predictors for the participation in VR. However, the multiple regression analysis revealed that the variables perceived ease of use, perceived usefulness, personal

innovativeness, age and the intention to participate in VOM are significant predictors for the intention to use VR.

Different reasons were given why participants would not want to schedule a meeting with the Researcher to try out VR. Answers were given as "I do not feel comfortable with VR." The Frequencies can be seen in the table underneath. 84 responses were given. Of the 85 people who would not want to schedule a meeting, some gave no reasons and others provided several answers.

Table 3

Frequencies of different reasons which hindered participants from using the VR application.

Reason to refuse the offer to schedule a meeting	
No time to schedule a meeting	34 (40.46%)
No Sona credits needed	2 (2.38%)
Physical symptoms	4 (4.76%)
Difficulties to relate to the situation	2 (2.38%)
Feeling uncomfortable in the situation/Anxiety	10 (11.9%)
Lack of trust in VR	5 (5.95%)
Personal reasons	4 (4.76%)
Anger	2 (2.38%)
Distance from the place where the meeting would be scheduled	5 (5.95%)
Feeling of being well prepared	1 (1.19%)
No interest	15 (17.85%)

In order to test the last hypothesis that the variables Anger and Anxiety moderate the relation between the Independent Variables and the Dependent Variable intention to participate in VR to get acquainted with VOM, ten Moderation Analyses were conducted by using PROCESS (Hayes, 2012). Model 1 was used to test if the variables Anger and Anxiety for each of the independent variables, perceived ease of use of the VR application, perceived behavioural control of the VR application, perceived usefulness of the VR application, knowledge and involvement with VR, and personal innovativeness in the domain of technology moderate their relationship with the intention to use VR. Furthermore, the variables gender, age were used as additional covariates.

The Moderator anxiety was tested with each of the independent variables perceived ease of use, perceived behavioural control, perceived usefulness, knowledge and involvement with VR and personal innovativeness in the domain of technology, and the covariates gender and age were used additionally. Therefore, all of the variables were part of each analysis. Also, the other moderator anger was used as a covariate. A two-way interaction was expected. However, the findings were against the expectations as no significant Interactions were revealed, due to p-values of the interaction effects being >.19, and b <.12. Therefore, anxiety did not moderate the effect of the variables perceived ease of use, perceived behavioural control, perceived usefulness, knowledge and involvement with VR and personal innovativeness in the domain of technology on the intention to use VR to get acquainted with VOM.

Secondly, the moderator anger was also tested with each of the independent variables and the covariates gender and age. The other moderator anxiety was used as a covariate in each of the five analyses, a two-way interaction was expected between the independent variables and the moderator anger. Anger did not moderate the relationship between the variables perceived ease of use of the VR application, perceived behavioural control of the VR application, perceived usefulness of the VR application and personal innovativeness in the domain of technology on the intention to use VR due to p-values >.38, b<.06 of the interaction effect. However, a significant interaction effect was found for the variable knowledge and involvement with VR, and the moderator anger; $F(1,99)=5.73$, $p<.02$. Figure 2 displays the impact of anger as a moderator on the relationship between knowledge and involvement and the intention to participate in VR. But it has to be indicated that the slopes of knowledge and involvement at different levels of anger are not significant; effects of knowledge and involvement at different levels of anger are significantly different from each other but not-significant on their own. As it is visible in the figure, the slopes go in different directions depending on the values of the moderator. Thus, it shows that no main effect exists between knowledge and involvement with VR, and intention to use VR, moderated by anger.[2]

[2] Exploratory Analysis: A Mediation Analysis was conducted for the independent variables perceived ease of use, perceived usefulness, personal innovativeness which were significant predictors in the multiple regression analysis. It was tested if the variable intention to participate in VOM would explain the relationship with the intention to use VR. The relationship was not found to be significant.

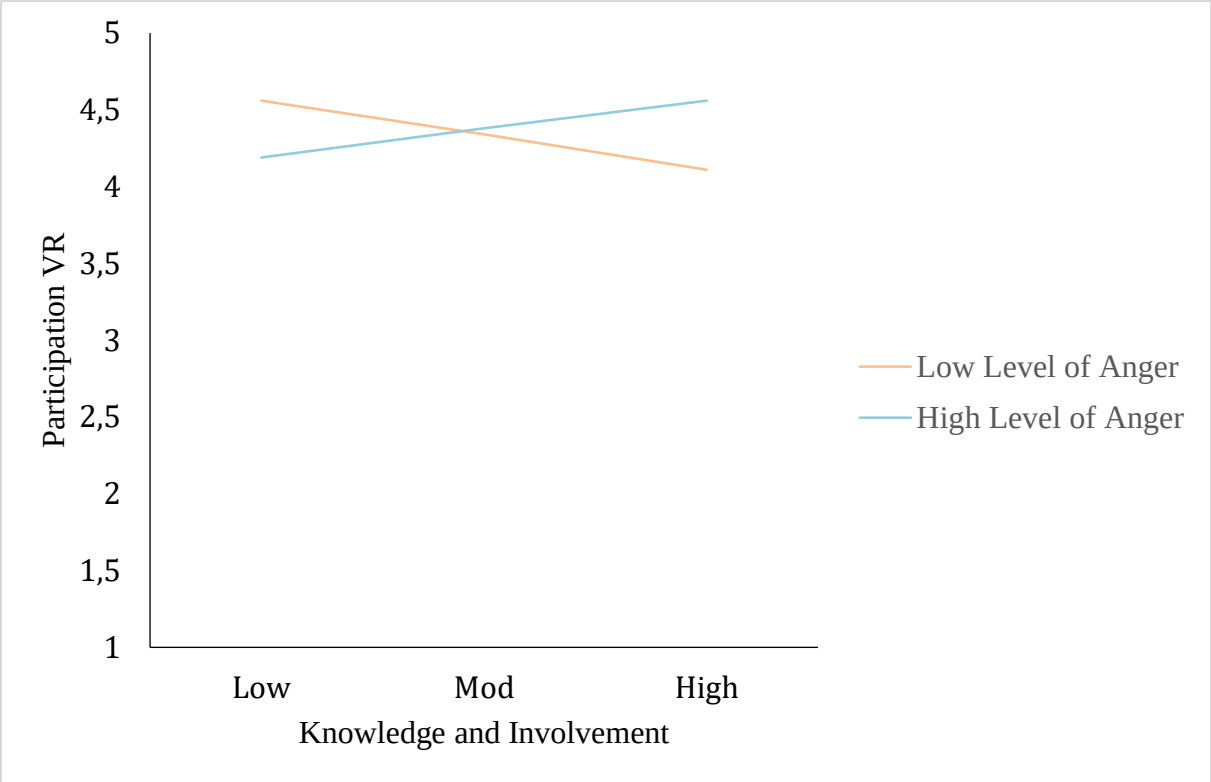

Figure 2. Impact of the Moderator Anger on the Relationship of Knowledge and Involvement with VR and the intention to use VR to get acquainted with VOM. Participation VR refers in this case to the variable intention to use VR to get acquainted with VOM.

Discussion

VOM is a worldwide more and more practiced process of restorative justice, and therefore, it is increasingly present in the literature. However, participation rates are still not as high as desired, even though good results could be seen after the process (Hansen & Umbreit, 2018). Problems arise due to different reasons, ranging from anxiety and uncontrolled emotions to insecurities concerning the process which might hinder people from participating (Paul & Schenck-Hamlin, 2017; Daly, 2006). The occurring insecurities might lead to victims not participating in VOM. In order to prepare victims sufficiently and decrease feelings of anger and anxiety, VR might be useful as it is also successfully used in the domain of anxiety disorders and treatment of anger (Miyahira et al., 2010).

Therefore, the current study was conducted to impact the effectiveness of the process and to find ways to prepare the victim sufficiently as the persisting insecurities need to be targeted. Due to VR, feelings of insecurity, anxiety, and anger towards meeting the offender can be treated. In order to give victims the chance to use VR as a preparation to get acquainted with VOM, factors need to be found which impact people on participating in VR. It should be examined to what extent the factors from the Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), User Information Satisfaction (UIS) model, and the character trait personal Innovativeness predict whether crime victims would have the intention to use VR to get acquainted with VOM, and which impact the emotions anger and anxiety have on these relationships. It was expected that perceived ease of use of the VR application, perceived behavioural control of the VR application, perceived usefulness of the VR application, knowledge and involvement with VR, personal innovativeness in the domain of technology predict the intention to use VR.

As a result of the research, it was found out, in line with the expectations, that (1) perceived ease of use, (2) perceived usefulness, (3) personal innovativeness predict the intention to use VR to get acquainted with VOM. The findings are in line with the TAM (Davis, 1989) proposing perceived ease of use and perceived usefulness as predictors for the use of technology. Furthermore, based on Fagan et al. (2012), the just mentioned are also predictors for the use of VR in a different context than the domain of restorative justice, together with the predictor personal innovativeness. They found out that those three factors predict nursing students' intention to use a VR based simulation for practicing some study-related practices (Fagan et al., 2012). By using the TAM, they showed that perceived ease of use, and perceived usefulness predicted the use of VR in the study-related context of nursing students, whose behavioural intention and the perception of this technology was higher when

perceived ease of use and perceived usefulness were high (Fagan et al., 2012). Also, the research shows, as in the findings of the current research, that personal innovativeness in the field of technology predicted the intention to use the application (Fagan et al., 2012). Furthermore, Herzallah & Mukhtar (2016) showed in their study on the factors predicting the intention to use and the perception of electronic commerce (EC) services of managers, that perceived usefulness had an impact on the intention to use the application. As the TAM was used, it can be assumed that the study also partly goes in line with the current research, but the different context of this study has to be taken into account. Finally, the current study adds to the study of Fang, Shao and Lan (2009) as they tested the impact of the factor of personal innovativeness on participants' intention to use web surveys in different kinds of fields. Fang et al. (2009) suggest that personal innovativeness had a positive impact on the intention to participate in web surveys. Thus, the intention to use VR to get acquainted with VOM depends on perceived ease of use, perceived usefulness, and personal innovativeness, respectively.

Additionally, it is found in the current study that (4) intention to participate in VOM and (5) age are predictors for the variable intention to use VR to get acquainted with VOM and the variable participation in VR, as in the study both intention and behaviour were tried to be measured. Interestingly, this finding could explain that the intention to use VR to get acquainted with VOM is given if the victim is rather willing to participate in VOM at all. Furthermore, Czaja & Lee (2007) show that there might occur changes in cognitive abilities which are related to age. Those are important for the design of VR applications as it helps to make VR suitable for the majority of people. The results of Czaja & Lee (2007) say that older people perceive more anxiety towards using these systems than younger people, and less confidence is felt towards one's ability to use them in a successful way (Czaja & Lee, 2007). Therefore, the attitude and technical support and other factors as the type of application and ease of access have to be taken into account (Czaja & Lee, 2007). However, the current study supports the opposite findings that age predicts intention to use VR positively. According to Czaja & Lee (2007), older people would be inhibited to use technology due to anxiety or less confidence. Different reasons could account for these findings. On the one hand, the majority of the sample of the current study was below 25, and thus, the factor age might be not as meaningful. Still, the predictor age on one's willingness to use technology as VR might need to be researched further as the cognitive difficulties of older people should be taken into account and the system should be adapted to reach both old and young participants. This might impact the attitude positively, which again would be an

important predictor for the use of technology in general (Czaja & Lee, 2007). Thus, it would be useful to define the different needs of older and younger people towards VR and adapt it accordingly.

Contrary to the expectations, it was concluded that perceived behavioural control of the VR application and knowledge and involvement with VR are no predictors for the intention to use VR to get acquainted with VOM. Those hypotheses were refused, which differs from previous research. Venkatesh et al. (2003) evaluated TPB (Ajzen, 1991) and showed that perceived behavioural control is supposed to predict the willingness to use information systems. Also, knowledge and involvement is assumed to predict the use of information systems (Treacy, 1985). Possible reasons for differing results might be the focus on information systems, which is not as specific as VR. Also, in the domain of VR, less knowledge might be initiated from the participants, and also the lack of experience might lead to a decrease in perceived behavioural control and usage might be perceived as rather difficult. It can be assumed that most participants have not used VR before. Contrary findings were also shown by Harrison, Mykytyn & Riemenschneider (1997). It was shown that perceived behavioural control predicted if small businesses would implement some sort of information systems (Harrison et al., 1997). No study was found which could predict perceived behavioural control and knowledge and involvement as predictors for the use of VR. Even though the results of the current study are negative, it might contribute to existing knowledge and impact future studies. It needs to be mentioned that Mathieson (1991) compares TAM with TPB which could give further insight into why perceived ease of use and perceived usefulness predict the intention to use VR to get acquainted with VOM, while perceived behavioural control did not. It can be concluded that TAM is focused on the domain of technology, while TPB was initially derived to predict behaviour in general (Mathieson, 1991). Even though TPB was also used in the technological domain, it might need to be adapted more specifically to VR by e.g. adding components focusing on specific behaviours regarding the usage of technology. TAM which is developed from TPB shows predictors for the intention to use VR and therefore, perceived behavioural control might show which perceived barriers occur to the participants by using the system but should not be as meaningful (Mathieson, 1991). The research presented was mainly conducted in the context of information systems and more generally than it was done in the researcher's study.

Lastly, anger and anxiety do not moderate the relationship between the predictors perceived ease of use, perceived behavioural control, perceived usefulness, personal innovativeness and the intention to use VR. However, an interaction effect was found between

knowledge and involvement of the user and anger. It was assumed, based on Wyrick & Constanzo (1999), that anger might inhibit participants' willingness to participate in VOM and based on Paul & Schenck-Hamlin (2017) that anxiety could also show an interaction effect. Therefore, it was concluded that the moderators impact the intention to use the VR application to get acquainted with VOM negatively. An interaction effect was found in just one case. It can be assumed that participants might perceive feelings of anger and anxiety but rather saw VR as a tool to get acquainted with VOM as support. Still, anxiety and anger had no direct effect on the intention to participate in VR. The interaction effect which was found might explains that feelings of anger influence the relationship between the knowledge and involvement level of the user and the intention to participate in VR. However, more research needs to be done in order to be able to generalise those findings, taking the impact of knowledge and involvement with VR into account. This would be also important in order to test if the found interaction effect occurred as a coincidence.

Finally, some qualitative data was used to explore the reasons why participants decided not to take part in VR. Those are important as this would impact the implementation of VR and it would be easier to develop an application which would find wide support in the society. Often it was said that the participants were afraid to feel uncomfortable in the situation or be anxious or did not trust the VR application. This could implicate that the participants need good support during the use of such an application and the procedure needs to be explained carefully to them.

Limitations

Some limitations also have to be indicated, which might have an impact on the current study. One limitation is that the participants were no real victims, and this could make it possible that they were not able to make accurate judgments regarding the crime.

Also, the crime scenario could be hard to imagine as it was just described through a text. The participants had to guess if they would participate, and this could differ from their feelings towards such a decision in reality. As both, crime scenario and VR scenario did not take place and were just described, also difficulties could evolve through misunderstanding towards the VR application. It can be concluded that it might impact the generalizability of the study.

An online questionnaire was implemented, which makes it difficult to control for outside variables. Therefore, it could be possible that due to emotional arousal based on a crime situation they might have had difficulties. Also, the participation in the questionnaire

might indicate that the participants are generally more open to this kind of technology and would answer accordingly. And concentration issues might be possible.

Finally, participants took part voluntarily by using the implemented platform SONA of the University of Twente or were from the researcher's social network. This could make the initial motivation to the willingness to participate in VR higher because the participants choose voluntarily to participate. Thus, it would be interesting to replicate the study with an unknown sample from a different context.

Implications

It would be from great importance to replicate the studies as the research in the field of VR as preparation for VOM is rather new. By using VR already in the study, better imagination of VR could be produced and also by showing, for instance, a video to introduce the participant to the crime scene might cause different results. Also, using a more diverse sample could help to define if age is a predictor of the intention to use VR to get acquainted with VOM and therefore, if VR is suitable preparation for VOM in general or if different approaches need to be developed for victims. Overall, the scales of the current study showed good validity and reliability and therefore, it would be useful to replicate the study with similar scales.

Another issue is that due to the voluntariness of VOM it might be difficult to convince people to take part in a preparation to get acquainted with VOM as the intention to participate in VOM seems to have an impact on the intention to use VR as a preparation. Therefore, it might be important to gain research on how to lower the insecurities of those people, for example through good preparation and also reach victims who are not interested in VOM or suffer from difficulties in the use of VR.

Additionally, as it is also indicated by Fagan et al. (2012) further research is required on how personal innovativeness in the domain of technology predicts the participation in VR, especially in combination with perceived ease of use of the VR application and perceived usefulness of the VR application. Thus, the current study might be a good start as it is found out to be a predictor. Also, anger and anxiety should be more deeply taken into account, even though they were not found to be moderators in the current study. But they are normal consequences of a crime and definitely need to be taken into account and the victim needs to be supported to deal with those.

Conclusion

It is important to mention that the use of VR to get acquainted with VOM is quite a new field, and to the researcher's knowledge, no studies were exploring this yet. However, more research in this domain might be helpful to develop the VR application itself further and also,

to make VOM accessible to an increasing number of victims. The predictors of the TAM model should be kept in mind and also the trait of personal innovativeness. The proper implication of VR application could decrease negative feelings about the process and lower insecurities. The positive impact of VR in the domain of VOM should be further spread in society as it might be a huge step to increase participation rates and decrease reoffending after a crime.

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Appendices

Appendix 1

Informed Consent

Before you proceed in this questionnaire, please read the informed consent information below.

The following survey is used to explore the factors impacting the participation in Virtual Reality (VR) to get acquainted with Victim-Offender Mediation (VOM). The factors are explored by asking you questions after you took part in an imaginary crime scenario.

Please be aware that participation in this study is entirely voluntary, and that you can stop taking part at any time. You may withdraw from this research at any point after submitting the survey. Under no circumstances will your real name or identifying information be included in the report of this research. Nobody, except the researcher and the research supervisor, will have access to this anonymized material in its entirety. Your data is treated confidentially, and the research results are published anonymously. Your personal data will not be given to third parties without your expressed permission. If you have any question, you may contact Johanna Veltmann.
If you have any complaints about this research, please direct them to the Secretary of the Ethics Commission of the faculty Behavioural, Management and Social Sciences at University of Twente through ethicscommittee-bms@utwente.nl.

If you click on proceed, you indicate that you have read and understood the informed consent, and have been informed in a manner which is clear to you about the nature and method of the research. By proceeding you agree with participating in this study.

Appendix 2

A crime scenario will be presented to you. Please read it carefully and imagine yourself being in the role of the victim. There will be questions asked about it afterward.

You are on your way home after a meeting with a friend. It is around 10pm, and you take the bus because it is already dark outside and it is raining. The bus is quite empty, and you go straight to the middle of the bus. You do not take a seat because you just have to stay there for 5 minutes.
Suddenly a man enters the bus who seems drunk. He talks loudly on the phone and holds a bottle of beer. He wants to pass you, but while moving, he accidentally touches your shoulder with his arm. He turns around and starts insulting you and perceives it as a provocation. You apologize and tell him that you did not touch him on purpose which makes him even angrier. At the moment, there is just one meter between you and him. He insults you and comes closer which seems very threatening. He says that he will punch you. However, the bus driver notices the situation, stops the bus and tells him to leave the bus and that he would call the police otherwise. The man hesitates but turns around, ready to leave the bus. Suddenly he raises the beer bottle, turns back and you can tell that the man tries to aim at your head. He throws the bottle towards you and runs out of the bus. The bottle comes closer, and you cannot avoid the bottle. It hits your shoulder, and you feel numbness in your arm.

Appendix 3

You report the assault to the police. After two weeks you are contacted that the offender has been caught.
The reason why you are contacted is that the offender requested Victim-Offender Mediation (VOM). VOM offers victims of crime and minor assaults the opportunity to meet the offender in a safe setting, together with a trained mediator. The victim can ask questions and talk about the emotional consequences of the crime. The victim is provided with the chance to meet the offender and thereby reduce fear and anger towards the offender. Thus, the offenders can take responsibility for their actions, can apologize to the victim and have the chance to compensate their action. Research shows that after participating in VOM, the rate of reoffending is reduced in offenders. Participation in VOM can, therefore, help both victim and offender to cope with the crime. You are asked if you would like to participate in VOM to meet the offender.

However, to receive more information about this form of mediation and get acquainted with the procedure a VR application can be used. Please answer the following questions. If you are willing to use VR, an appointment will be made with you afterward, to use the VR application at the University of Twente. The VR application would be a head-mounted device which provides you with the perspective of the victim. While using it, you would feel as if you take part in VOM and the application is personalized and adapted to the kind of crime which you experienced, in this case assault. You would have the chance to ask questions to the avatar offender. The answers that the offender and mediator can give are pre-programmed and originate from a database which is filled with dialogues from thousands of VOM cases. Through the use of this VR application, you can experience how VOM takes place and how the mediator addresses the concerns of both parties.

Appendix 4

1. I think I could use this VR application without consulting the User Manual.
2. I can imagine that the VR application about VOM would be flexible to interact with.
3. I think it would be easy for me to use this VR application about VOM.
4. I assume that this VR application would provide helpful guidance to experience VOM.

1. I think I would be capable of using this VR application about VOM.
2. I feel that I would have complete control over using this VR application about VOM.

1. Using this VR application would save me time to get information about VOM.
2. The VR application about VOM would enable me to prepare for VOM more quickly.
3. This VR application enables me to get acquainted with VOM faster than when I would inform myself in other ways about VOM.
4. It would be difficult for me to get acquainted with VOM without this VR application.
5. I would consider the VR application about VOM to be useful to get acquainted with VOM.

1. I have the feeling that I already know a lot about VR.

2. I already have some personal experiences with VR.
3. I already have some personal experiences, using VR in emotional situations.

1. If I hear about new information technology, I would look for ways to experiment with it.
2. Among my peers, I am usually the first to try out new information technologies.
3. In general, I am hesitant to try out new information technologies.
4. I like to experiment with new information technologies.

1. I can imagine feeling unsteady because of the offender.
2. I can imagine feeling terrified towards the offender.
3. I can imagine feeling very nervous due to the offender.
4. I can imagine feeling unable to relax because of the offender.
5. I can imagine being fearful when thinking of the offender.
6. I think I would be scared of the offender.

1. I can imagine feeling angry towards the offender.
2. I can imagine feeling unable to control my negative feelings towards the offender.
3. I can imagine feeling outraged towards the offender.
4. I can imagine feeling furious towards the offender.

Appendix 5

1. I would participate in this VR application about VOM.
2. I think that this VR application about VOM in general can be useful.
3. In my opinion, this VR application about VOM would prepare me successfully for VOM.
4. I would like to experience this VR application about VOM to prepare for VOM.
5. I would like to put myself in the position of the victim in the VR application about VOM.
6. By using the VR application about VOM I would feel less anxious about the meeting with the offender.

1. At this point of time I would accept the mediation proposal of the offender.
2. I would like to participate in the actual meeting with the offender in VOM.
3. My decision to participate in the actual meeting with the offender in VOM would depend on my experiences in the VR application.
4. Would you like to schedule a meeting with the researcher to try out the VR application? Yes/No

If you choose no, please indicate why you would not want to schedule a meeting with the supervisor:

Appendix 6

1. I participated seriously in the study.
2. I was able to imagine the incident with the pictures and the description of the scenario.
3. I answered the questions honestly.

1. Age
2. Gender
3. Nationality
4. Main Activity

1. Is there anything about the VR application about VOM described above that remains unclear to you?
2. If you are a student of the University of Twente and participated on SONA, did you also participate in another questionnaire on SONA with the topic of VR in the context of VOM?

Appendix 7

Thank you for participating in my study. The study is used to explore the factors impacting the victim to take part in VR to prepare for VOM, as this could facilitate the process and decrease the insecurities to take part in the procedure. The VR appointment will not take place. It was a deception used to make it more realistic and test which factors are predictors for the behavior. If you have any questions regarding the survey don't hesitate to contact Johanna Veltmann.