



# UNIVERSITY OF TWENTE.

**Faculty of Behavioural, Management  
& Social Sciences**

## **A Barfight in Virtual Reality: Assessing the Effects of Emotional States and Personality Traits on the Intention to Aggress**

**Jonas Weber**

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**Supervisors:**

First: Prof. Dr- Jean – Louis Van Gelder

Second: Ben G. Ganschow

Faculty of Behavioural, Management  
and Social Sciences  
University of Twente  
P.O. Box 217  
7500 AE Enschede  
The Netherlands

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### **Abstract**

The current study had three goals, with the first goal to replicate the findings by Van Gelder, De Vries, Demetriou, Sintemaartensdijk and Donker (2019), who found that Realism and Presence are perceived to be higher in a virtual reality (VR) scenario compared to a traditional written scenario. The second goal was to investigate whether or not the traits Agreeableness, Emotionality and the emotional states Anger, and Anxiety have an effect on an individual's Intention to Aggress. The third goal was to examine to what extent the emotional states mediate the relation between the traits and the Intention to Aggress. The final dataset included 151 Dutch, male participants who were mostly students of the University of Twente. Through random allocation the participants either experienced a "bar-fight" scenario in VR or read it. Subsequently, participants were presented with questionnaires measuring, Intention to Aggress, State Anger, State Anxiety, Presence, Realism and the traits Emotionality and Agreeableness. Results indicated that both Agreeableness and State Anxiety have a negative and State Anger to have a positive effect on Intention to Aggress. Additionally, the results indicated that part of the effect of Agreeableness operates via State Anger. Furthermore, participants scored higher on Realism, Presence and Intention to Aggress in the VR condition. It seems that by using VR, participants experience the scenario as more intense and react to it more similar to how they would react in real life. Thus, the first goal was achieved, and the researcher concluded that VR has several advantages over written scenarios when investigating the Intention to Aggress.

## **Introduction**

Imagine the following situation: You are out eating with your girlfriend when suddenly a guy starts to flirt with her. Not only that but he behaves very rude towards you. What would you do? Based on the results of previous research, it can be suggested that your decision to react to that provocation is likely to be influenced by your personality and the current emotional state you are in (Lerner, Li, Valdesolo & Kassam, 2015; Van Gelder & De Vries, 2012).

Therefore, the current paper aims to investigate to what extent emotional states mediate the relation between personality traits and the intention to aggress. To be more precise, this paper will investigate the traits agreeableness and emotionality as well as the emotional states anger and anxiety. Further, the two states and traits and their influence on the decision to engage in aggressive behaviour will also be investigated.

The current study uses a ‘barfight’ scenario. The scenario is very similar to the situation described above. Participants either experience the situation by means of a written scenario or a scenario in VR. The aim is to investigate whether the findings of Van Gelder et al. (2019), can be replicated. This current study uses a similar design, the same scenario as well as same VR-video as the study of Van Gelder et al. (2019).

To summarize, this thesis has three main aims, first, whether or not the findings of Van Gelder et al. (2019) can be replicated. Second, to what extent both traits and states impact the intention to aggress and lastly, to what extent the emotional states anger and anxiety mediate the relation between the personality traits agreeableness and emotionality on the intention to aggress. As the current study makes use of VR, it is necessary to explain why it can be a useful tool for social science.

### **What is Virtual Reality?**

VR describes an environment that is digitally created and where humans, with the means of technological devices, like a laptop, an Xbox or VR goggles, can submerge into (Fox, Arena & Bailenson, 2009). As long as something can be digitally created, it can be incorporated in VR. In some cases, it is possible for a person in VR to interact with objects, the environment or other people (Fox, Arena & Bailenson, 2009).

A form of VR is called immersive VR (Lombert et al., 2019; Makransky, Terkildsen & Mayer, 2019; Van Gelder, Otte & Luciano, 2014). Immersive VR is mostly experienced via a so-called “head mounted display” (HMD). The HMD is placed on a user’s head in such a way that he or she will have a display right in front of his or her eyes. Thereby, a feeling of being right in the scenario which is played by the VR-device is created. Further, any outside

or “real-life” visual information are blocked out by the device. While using a HMD, it is also possible to play a 360-degree video, in which the user has the opportunity to move his or her head and look at any direction he or she likes (Van Gelder et al., 2019).

### **Virtual Reality in Social Sciences**

In the late eighties, VR was first implemented in social sciences, such as psychology (Fox et al., 2009). The new tool gave the researchers the opportunity to conduct research with participants without the limits of their physical world. For example, in phobia treatments VR became a common tool to help individuals confront their anxieties and phobias. Until now, studies show promising results (Parsons & Rizzo, 2008). However, when focusing on criminology, VR is not yet seen as a common tool to use in research (Van Gelder et al., 2014). Nevertheless, Van Gelder et al. (2014) argue that VR should be used more often in the field of criminology. According to Van Gelder et al. (2014), using VR makes it possible for researchers to achieve and combine both high amounts of realism and experimental control. Additionally, scenarios, like a barfight or a burglary, that are created in VR are safe and cost-efficient. Criminal research could benefit from that as the similar scenarios are difficult and costly to recreate in real life. Therefore, according to Van Gelder et al. (2014), VR is suitable to research criminal behaviour.

In a previous study, Van Gelder et al. (2019) argued that presence and realism are likely to be perceived higher in a VR scenario when compared to a written scenario. The current study aims to replicate these findings.

**Presence.** ‘Presence’ refers to the individuals feeling of being in a scenario (Van Gelder et al., 2014). The higher the level of presence, the more likely an individual will respond physiological and psychological to a scenario similar to what he or she would respond in real life (Riva et al., 2007; Sanchez & Slater, 2005). For example, an increased amount of presence was associated with an increased heart rate of participants in a stressful (virtual) environment, which is similar to a real-life response (Van Gelder et al., 2014). Additionally, previous studies indicated that emotional reactions to a simulated character in the VR can be similar to the reaction of a person experiencing a real-life encounter of such a situation (Riva et al., 2007). The level of presence can be increased through different factors. For example, if a head movement occurs by the participant, the smaller the delay of the display update, the more the level of presence is increased (Sanchez & Slater, 2005).

**Realism.** ‘Realism’ refers to how real an individual experiences a scenario (Van Gelder et al., 2019). According to Witmer and Singer (1998), the more realistic the experience is, the more the user will submerge in the VR while simultaneously shutting out cues from the real world. This process was coined immersion (Witmer & Singer, 1998). A scenario in VR provides the participant, for example, with a surrounding, characters of the story and so on, thereby decreasing the amount of imagination the participant needs to feel immersed into the story (Van Gelder et al., 2014). The experience is not only limited to visual cues, for example, sounds are often implemented as well (Witmer & Singer, 1998.) This can make the experience even more realistic and the immersion in VR even easier, faster and more intense. Van Gelder et al. (2019) argue that by increasing realism and presence, participants are more likely to experience emotions that are similar to those experienced in real life.

### **Intention to Aggress and the Relation to States and Traits**

States can occur momentarily and are thus determined by a certain situation and arise and end with the situation. Nevertheless, states can strongly influence a decision (Van Gelder & De Vries, 2012).

**Anger.** If a person experiences an angry feeling, the person, at that moment, is in the state of anger. According to Lerner and Keltner (2001), the experience of anger can influence a person’s risk-perception. An angry person, compared to a person in a calm state, has a more positive mindset towards risk estimation as well as risk seeking. Based on the research of Lerner and Keltner (2001), it can be assumed that an individual that finds him – or herself in an angry state, for example, through provocation, will likely perceive the risk to engage in aggressive behaviour as less severe than a person in a calm state. Hence, behaviours like aggressive driving or fighting and attacking other individuals are likely to be the result (Brezina, Piquero & Mazerolle, 2001; Deffenbacher, Lynch, Oetting, & Yingling, 2001). The opposite can be seen with people that score high on anxiety measures (Lerner & Keltner, 2001).

**Anxiety.** Anxiety can be described as an emotional and behavioural response of an individual to a situation that is perceived as stressful or threatening (Neumann, Veenema, & Daniela, 2010). An anxious person will more likely perceive the risks of conducting aggressive behaviour as more severe than the benefits of it and is therefore, less likely to engage in it (Lerner and Keltner, 2001). However, while examining aggressive action, Scarpa and Raine (1997) found that children with an anxiety disorder had an increased tendency to use physical aggression. Thereby, concluding that anxiety can also increase the use of

aggressive behaviour in an individual. In accordance with those findings, Neumann et al. (2010) argue that individuals who suffer from psychological disorders related to anxiety often display aggressive behaviour. Additionally, Campbell and Hausmann (2013) found that women were more likely to aggress against an opponent when in an anxious state. Previous results, regarding the effect of high and low scores on anxiety on the intention to aggress, seem to be ambiguous, thereby, making it necessary to investigate.

Previous studies have found that criminal decision making can be related to the personality traits of an individual (Jones, Miller and Lynam, 2011, Van Gelder and De Vries, 2012). The relationship has been found to be both indirect as well as direct (Van Gelder & De Vries, 2012). Traits are mostly stable, meaning they do not or hardly change over the course of life. They indicate individual differences in predispositions to think, behave and feel. For example, a person that is believed to score high on a personality test measuring anxiety should be more prone to feel anxious in general compared to a person who scores low on this trait (Spielberger & Sydeman, 1994). Two personality traits, namely agreeableness and emotionality, have been found to be linked to criminal behaviour (Jones et al., 2011). Therefore, this study will focus on these traits, which are explained in the following.

**Agreeableness.** The first trait, Agreeableness, is represented in the Big Five personality inventory (Extraversion, Conscientiousness, Openness to Experience, Agreeableness and Neuroticism) as well as in the HEXACO (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness and Openness to Experience) model (Van Gelder & De Vries, 2012). Grazino and Tobin (2009, p. 46) define Agreeableness as “individual differences in being likeable, pleasant, and harmonious in relations to others”. It is mainly focused on the diversity of individuals orientations towards interpersonal relationships. In general, it can be stated that individuals scoring high on Agreeableness tend to be very trusting, empathetic and forthright (Miller, Lynam, & Leukefeld, 2003). In contrast, individuals who score low on Agreeableness tend to be manipulative, arrogant and quickly lose their temper.

Based on the results of the study of Miller et al. (2003), it can be suggested that people tend to act more aggressively the lower they score on Agreeableness, thereby linking antisocial behaviour, and more preciously aggressive behaviour, to Agreeableness (see also: Jones et al., 2011; Miller, Lynam & Jones, 2008). Agreeableness was also found to be linked to immediate retaliation, meaning that a person who scores low is more likely to engage in immediate retaliation after feeling wronged or feeling provoked by another person (Lee &

Ashton, 2012). Furthermore, Lee and Ashton (2012) suggest that low scores on Agreeableness are linked to both vengeful and displaced aggression. Thus, individuals scoring low on Agreeableness are more likely to immediately aggress against an offender but also against their general environment if the source of the aggression is not present.

It seems likely that individuals who score low on Agreeableness frequently find themselves in an angry state as they have a tendency to quickly lose their temper (Van Gelder and De Vries, 2012). Therefore, anger might be mediating a part of the effect of Agreeableness on Intention to Aggress. Additionally, Van Gelder and De Vries (2012) suggest that the quick loss of temper could work as disincentive against feelings of anxiety or fear a decision situation might provoke. Therefore, it can be assumed that anxiety does not mediate part of the effect of Agreeableness on Intention to Aggress.

**Emotionality.** The second personality trait that is examined is Emotionality. Individuals that score high on Emotionality can be described as vulnerable, sensitive, anxious or on the opposite spectrum as fearless, tough and unemotional (Ashton, Lee & De Vries, 2014). There are also more likely to experience anxiety compared to a person scoring low on Emotionality (Ashton et al., 2014). The corresponding reaction to that feeling of anxiousness is also likely to be more extreme for an individual scoring high on Emotionality. Therefore, it seems reasonable to assume that high scoring individuals are likely to engage less in aggressive behaviour as they are more prone to experience anxiety in such situations.

Van Gelder and De Vries (2012) argue that low scores on Emotionality could be linked to criminal behaviour and further indicate a lessened feeling of fear and anxiousness, also regarding potential consequences of criminal behaviour. The anticipation of severity and likelihood of consequences is less strong while high risk situations are perceived as less dangerous (Van Gelder & De Vries, 2012). Hence, individuals who score low on Emotionality might be more inclined to engage in aggressive behaviour than individuals who score high on this trait. Their results showed an indirect effect of Emotionality on criminal decision making, mediated by perceived risk and negative state affect. Thereby, confirming the assumption that individuals with high scores on Emotionality anticipate higher risks and more severe outcomes when engaging in criminal behaviour as well as feeling more anxious about it than individuals who score low (Van Gelder & De Vries, 2012).

As anxiety is a central part of emotionality (Ashton et al., 2014), it can be assumed to mediate part of the effect of emotionality on intention to aggress. Additionally, negative emotionality, that is the individual's tendency to react to negative emotions, such as anger,



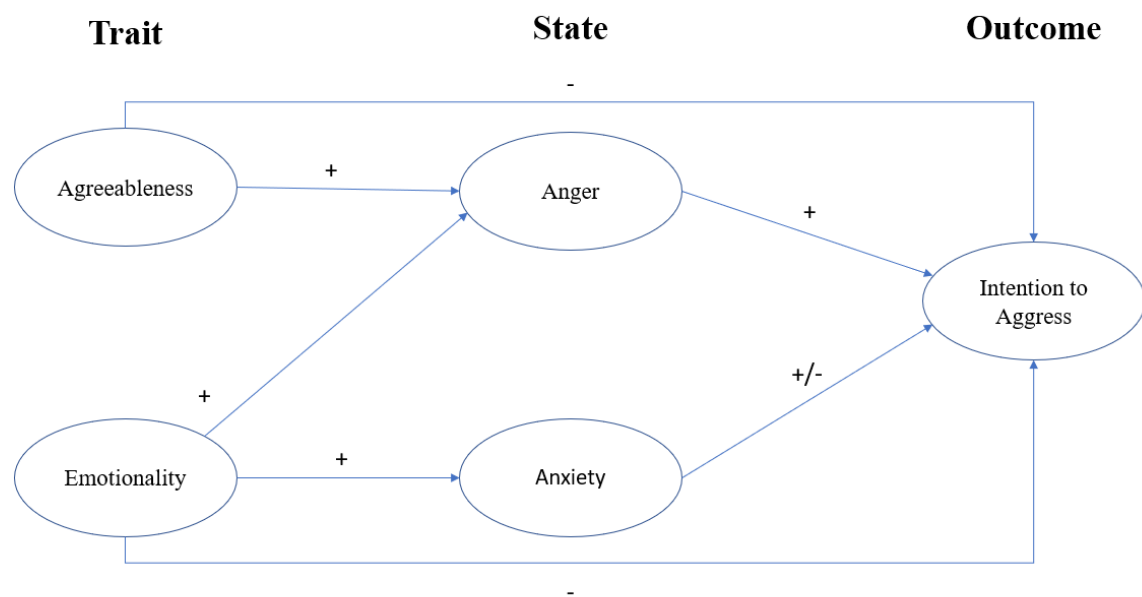
has been linked to aggressive behaviour (Kann, O’Rawe, Huang, Klein & Leung, 2017, Garofalo & Velotti, 2017; Verona, Patrick & Lang, 2002). It seems that especially in stressful situations, anger may mediate part of the effect of emotionality on intention to aggress.

### **The Present Study**

Based on the evidence stated above, it seems reasonable to believe that both trait and state level influence an individual’s intention to aggress. This notion is in line with the argumentation of Van Gelder and De Vries (2012), who argue that it is important to integrate both traits and states into a model since both can influence the decision to conduct criminal behaviour as well as both are related to each other. Therefore, the current paper aims to answer the research question: “Does the effect of Agreeableness and Emotionality on Intention to Aggress operate via the emotional States Anger and Anxiety?”.

In this study it is hypothesized that participants will have an increased feeling of presence and realism in the VR – condition when compared to the written scenario (H1). Second, it is hypothesized that both Agreeableness and Emotionality have a negative effect on Intentions to Aggress (H2). Third, it is hypothesized that State Anger has a positive and State Anxiety to have either a negative or positive effect on Intentions to Aggress (H3). Fourth, it is hypothesized that part of the effect of Agreeableness on Intentions to Aggress is explained by State Anger (H4). Finally, it is hypothesized that part of the effect of Emotionality on Intentions to Aggress operates via State Anger and State Anxiety. (H5, see Figure 1).

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*Figure 1:* Hypothetical model of Agreeableness, Emotionality, State Anger and State Anxiety effects on Intention to Aggress as well as assumed mediations.

## Methods

### Participants

The nature of the scenario required participants to be male, heterosexual and Dutch native speakers. Participants were mostly students of the University of Twente,  $N=151$  ( $M_{\text{age}} = 22.89$ , age range: 18-59). The original dataset contained 174 participants, however, 23 of the participants did not fill out every question, therefore they were excluded from the final dataset that was used for this study. All participants received a compensation for participating in the study. The compensation was either a 5-euro VVV-voucher or 0.75 study credits.

### The Procedure

The current study was conducted in the IDEATE laboratory of the University of Twente in the Netherlands over the course of several weeks. Participants were seated in a small room. The researcher introduced the participants to the procedure and potential risks, for example nausea, of the study. Further, it was indicated that participants were able to terminate the study at any given point. Subsequently, the participants were presented an informed consent. After giving consent, the participants were randomly assigned to the written or the VR scenario. The participants in the first group (written condition) were asked to read the scenario and fill out the questionnaires.

A researcher equipped the participants of the second group with Samsung Gear VR goggles and headphones. Subsequently, the participants experienced the scenario. When the participants were done watching, they were asked to fill out a range of questionnaires. The participants were able to fill out the questionnaires via a laptop. After finishing the questionnaires, the participant received a compensation for his participation in the study. Subsequently, if the participant had any questions regarding the nature of the study, he had the chance to ask them.

### Materials

**Demographics.** Items for the following demographics of the participants were included into the questionnaire: Age, education, gender, relationship status and, when indicated, duration of relationship (see Appendix A).

**Attractiveness of Lisa.** A single item scale was included in order to measure the participants perceived Attractiveness of Lisa, who is the person representing the participants girlfriend in the scenario (see Appendix B). Similar to the study of Van Gelder et al. (2019), this item was used as a control variable as it could give insight whether or not the

Attractiveness of Lisa has an impact on the Intention to Aggress. The item used a seven-point Likert scale (not at all attractive – very much attractive).

**Realism.** For measuring Realism, the same scale as in the study of Van Gelder et al. (2019) was used (see Appendix C). The scale consisted of six items (for example: I think the scenario was convincing). The items used a seven-point Likert scale (strongly disagree – strongly agree). The estimation of Cronbach's Alpha ( $\alpha = .89$ ), suggested good internal consistency.

**Presence.** In order to measure Presence, a 13-item scale was used that was developed by Schubert, Friedman and Regenbrecht (2001). It was further adapted by Van Gelder et al. (2019) in order to include items that suited both the VR and the written condition (see Appendix C, example item: I felt emerged in the scenario). The items used a five-point Likert scale (strongly disagree – strongly agree) and the estimation of Cronbach's Alpha ( $\alpha = .80$ ) suggested good internal consistency.

**Intention to Aggress.** For measuring the Intention to Aggress, two items were used (see Appendix D, example item: How likely is it that you would use violence in this situation, such as pushing, punching or kicking?). The first item used a seven-point Likert scale (very unlikely – very likely) while the second item asked the participant to give a percentage estimate of how likely he is to use violence. The second item was recoded to a seven-point Likert scale. In order to construct the Intention to Aggress scale, the mean scores of both items were used. The estimation of Cronbach Alpha ( $\alpha = .92$ ) suggested excellent internal consistency.

**State Anger.** In order to measure the State Anger of the participants, an anger scale that was developed by Van Gelder et al. (2019) was used (see Appendix D). The scale consisted of five items (for example: Are you angry?). The items used a seven-point Likert scale (not at all – very much). The estimation of Cronbach Alpha ( $\alpha = .91$ ) suggested excellent internal consistency.

**State Anxiety.** In order to measure the State Anxiety of the participants, an anxiety scale was used (see Appendix D). The scale consisted of five items (for example: Did the situation give you an unsafe feeling?). The items used a seven-point Likert scale (not at all – very much). The estimation of Cronbach Alpha ( $\alpha = .86$ ) suggested good internal consistency.

**Agreeableness, Emotionality and Honesty.** In order to measure the personality traits of the participants, an adapted version of the HEXACO 104 was used (Ashton et al., 2014). Only the scales for Emotionality (15 items, for example: I feel tears coming when I see other

people cry.), Agreeableness (16 items, for example: My attitude concerning people who treat me badly is to forgive and forget.) and Honesty (10 items, for example: I would not boast to get a raise or promotion at work, even if it would be successful.) were included (see Appendix E). The items used a five-point Likert scale (I totally disagree – I totally agree). In total, the Cronbach's Alpha of the scale including the items of Emotionality, Agreeableness and Honesty (41 items in total,  $\alpha = .76$ ) suggested acceptable internal consistency.

**Self-Reported Delinquency.** The researcher assumed that delinquent behaviour in the past might influence an individual's score on Intention to Aggress. Therefore, Self-Reported Delinquency was used as control variable. Accordingly, a scale was developed that included a scale by Svensson, Weerman, Pauwels, Bruinsma and Bernasco (2013) as well as two items of the Youth Risk Behaviour Surveillance System (Centre for Disease Control and Prevention, n.d.). The scale consisted of 22 items (see Appendix F, example item: How often did you put something on fire in the last 2 years?). A Self-reported Delinquency scale was constructed based on the mean scores of the items. The items used a five-point Likert scale (never – more than 10 times). The estimation of Cronbach Alpha ( $\alpha = .82$ ) suggested good internal consistency.

**Self-Reported Victimization.** The researcher assumed that victimization in the past might influence an individual's score on Intention to Aggress. Therefore, Self-Reported Victimization was used as control variable. In order to measure Self-reported Victimization, a scale, based on the Veiligheidsmonitor 2014 was used (CBS, 2015). In total, 14 items were used (see Appendix G, example item: How often has there been a burglary, or attempt therefore, in your home in the last 2 years?). The items used a five-point Likert scale (never – more than 10 times). The estimation of Cronbach Alpha ( $\alpha = .83$ ) suggested good internal consistency.

### **The Scenario**

Both the VR as well as the written scenario used for the current paper are the same as the ones used in the study of Van Gelder et al. (2019). Ahead of the scenario, the participant of both conditions watched a video which depicted landscapes in order to ensure that all participants were in a neutral state. The situation the participant was confronted with goes as follows (see Appendix H): The participant is out eating with his girlfriend Lisa. When he returns from paying the bill, he finds that another guy started flirting with his girlfriend. A verbal conflict between the two males arises that quickly escalates.

**Experience of the Scenario.** In the VR condition, the participant experienced the scenario via a 360° video that was played on a Samsung Galaxy S7 that was attached to a Samsung Gear VR Headset. Furthermore, the participant wore headphones in order to not be disturbed by outside noises. Participants who were in the reading condition, read the scenario on a laptop.

**The Design and Making of the Scenario.** The written scenario was designed so that it closely resembled the one experienced in the VR. The VR scenario was filmed in a pub in Amsterdam. In order to place the participant in the middle of the action, the video was filmed with a helmet with six GoPro cameras attached to it. Thereby, it was ensured that the participant, while in VR, experienced the scenario from his perspective and was able to look in any direction of his liking.

## Results

In order to answer the research question and test the five hypotheses, different analyses were conducted. Based on the study of Van Gelder et al. (2019), the Attractiveness of Lisa was used as a control variable. An image of an actual person portraying Lisa was provided for the participants in the VR-condition. However, in the written scenario the participants had to imagine Lisa by themselves. Therefore, differences between the conditions could arise. Thus, the difference between the condition 1 – VR scenario (VR,  $N_{VR}=78$ ) and condition 2 – Written scenario (W,  $N_W=73$ ) in terms of the perceived Attractiveness of Lisa was examined. While Van Gelder et al. (2019) found that participants perceived Lisa as significantly more attractive in the written condition, the current study found that Lisa was perceived only slightly more attractive in the written condition ( $M=4.96$ ,  $SD=1.62$ ) compared to the VR-condition ( $M=4.49$ ,  $SD=1.23$ ). Nevertheless, for the following analyses, the Attractiveness of Lisa was taken as control variable as it could give insight in whether or not the Attractiveness of Lisa has an impact on the Intention to Aggress.

Second, partial correlations were computed between condition, State Anger, State Anxiety, Emotionality, Agreeableness, Self-reported Victimization (SRV), Self-reported Delinquency (SRD) and the outcome variable Intention to Aggress (see Table 1). All variables correlated significantly with Intention to Aggress except for SRV, State Anxiety and Emotionality. As expected, Agreeableness was significantly negatively correlated with Intention to Aggress, while State Anger, Presence, Realism and SRD were significantly positively correlated. Further, Presence and Realism were both correlated with State Anger, State Anxiety, Agreeableness and themselves. The findings largely overlapped with the findings of Van Gelder et al. (2019).

**Table 1.** Bivariate Correlation (above diagonal), Partial Correlation (below diagonal, controlling for Attractiveness of Lisa) and Descriptives for Attractiveness of Lisa, State Anxiety, Emotionality, Agreeableness, Guilt/Shame, SRD, SRV, Realism, Presence and Intention to Aggress.

	1	2	3	4	5	6	7	8	9	10	11
Mean	4.72	3.92	4.67	2.84	3.09	4.41	1.17	19.33	3.50	3.16	2.78
SD	1.44	1.37	1.53	.44	.51	1.83	.24	5.34	.69	.73	1.74
1. Attract. of Lisa	-	.14	.13	-.08	.09	-.05	.19*	.23	.23	.23**	.13
2. State Anxiety	-	-	.52*	.17*	-.06	-.02	-.00	.05**	.28**	.28**	.16
3. State Anger	-	.51**	-	.08	-.35**	-.40**	.10	.06	.46**	.48**	.58**
4. Emotionality	-	.18*	.09	-	.24**	.09	-.06	-.04	-.00	.00	.03
5. Agreeableness	-	-.07	-.37**	.25**	-	.32**	-.18*	-.07	-.21**	-.26*	-.37**
6. Guilt/Shame	-	-.00	-.39**	.09	.32**	-	-.07	-.00	-.26**	-.57**	-.57**
7. SRD	-	-.03	.08	-.05	-.21**	-.06	-	.43**	.12	.07	.24**
8. SRV	-	.02	.04	-.03	-.10	.00	.41**	-	.04	.12	.13
9. Realism	-	.25**	.44**	.02	-.23**	-.26**	-.03	-.02	-	.77**	.32
10. Presence	-	.26**	.47**	.03	-.30**	-.34**	.02	.07	.76**	-	.49*
11. Intention to Aggress	-	.14	.57**	.04	-.39**	-.57**	.22**	.10	.30**	.46**	-

Note. N= 151, SD= Standard Deviation, SRD= Self-Reported Delinquency, SRV= Self-Reported Victimization

\*p<.05. \*\*p<.01



Next, the difference between Realism and Presence in the VR-condition and the written condition was examined (see Table 2). In line with hypothesis 1, both conditions differed significantly on Presence as well as on Realism. Furthermore, participants scored higher on Intention to Aggress in the VR-condition. The scores on State Anxiety and State Anger were similar in both conditions

**Table 2.** *Mean and Standard Deviation estimates of Presence, Realism, Intention to Aggress, State Anger and State Anxiety per condition.*

Condition	VR	Written
Variables	M (SD)	M (SD)
Presence	3.38 (.62)	2.93 (.78)
Realism	3.67 (.57)	3.32 (.76)
Intention to Aggress	2.94 (1.81)	2.60 (1.65)
State Anger	4.49 (1.43)	4.47 (1.61)
State Anxiety	3.90 (1.22)	3.94 (1.52)

*Note.* N= 151, SD= Standard Deviation

Subsequently, stepwise regression analysis was employed to predict Intention to Aggress from Emotionality, Agreeableness, State Anger and State Anxiety (see Table 3). In each model, Attractiveness of Lisa, SRD and SRV were used as control variables. In the first step, the control variables were included. In the second step, Agreeableness and Emotionality were included. Agreeableness was found to be a significant predictor for Intention to Aggress, while Emotionality was only found to be a marginally significant predictor. In the third step, State Anger and State Anxiety were added. Both were found to be significant predictors for Intention to Aggress. In the final model, SRD, Agreeableness, State Anger and State Anxiety were significant predictors of Intention to Aggress. All predictor variables together explained 41.9 percent of the total variance.

Accordingly, the results show partial support for hypothesis 2 as Agreeableness was found to have a negative direct effect on Intention to Aggress while no effect for Emotionality

emerged. Further, the results fully support hypothesis 3, as State Anger was found to have a direct positive effect and Anxiety to have a direct negative effect on Intention to Aggress.

**Table 3.** *Unstandardized and Standardized Regression Coefficients of Intention to Aggress on Emotionality, Agreeableness, State Anger, State Anxiety, SRD, SRV and Attractiveness of Lisa.*

Variables	Step 1		Step 2		Step 3	
	B (SE)	$\beta$	B (SE)	$\beta$	B (SE)	$\beta$
SRD	1.57 (.66)	.21*	1.02 (.62)	.14	.92 (.54)	.13*
SRV	.01 (.03)	.02	.01 (.03)	.01	.01 (.02)	.02
Attractiv. of Lisa	.10 (.10)	.08	.18 (.09)	.15	.09 (.08)	.07
Agreeableness			-1.32 (.27)	-.39**	-.59 (.25)	-.18*
Emotionality			.57 (.30)	.15 <sup>+</sup>	.29 (.27)	.07
State Anger					.66 (.09)	.58**
State Anxiety					-.22 (.10)	-.18*
R <sup>2</sup>		.06**		.20**		.42*

*Note.* N= 151, SE= Standard Error, SRD= Self-reported Delinquency, SRV= Self-reported Victimization

<sup>+</sup>p<.10

\*p<.05.

\*\*p<.01

In the final step, it was analysed whether the effects of Emotionality or Agreeableness on Intention to Aggress are mediated by emotional states, that are State Anger or State Anxiety. The PROCESS add-on for SPSS was used for the mediation model (Preacher & Hayes, 2004). A nonparametric bootstrapping procedure was used. A total of 5000 bootstrap samples were used. The perceived Attractiveness of Lisa, SRD as well as SRV were again used as control variables. When State Anger was regressed on Agreeableness, a significant effect was found (see Table 4). Furthermore, Agreeableness as well as the mediator State Anger were regressed on Intention to Aggress. In accordance with the results of the stepwise regression a significant direct effect was found for the mediator State Anger as well as for Agreeableness on Intention to Aggress. Further, the bootstrap procedure showed a significant indirect effect of Agreeableness, through State Anger, on Intention to Aggress (B=-.62,

SE=.16, 95% CI [-.95, -.32]). Thereby, indicating that, as it was hypothesized, State Anger mediated the relation between Agreeableness and the Intention to Aggress. Accordingly, the results support Hypothesis 4.

**Table 4.** *Unstandardized Regression Coefficients with Standard Errors 95% Confidence Intervals (CIs) estimating the Relations between the Predictor Agreeableness, the Mediators State Anger, and the Outcome Variable Intention to Aggress with SRD, SRV and Attractiveness of Lisa as Covariates (Simple Mediation).*

Independent Variable	Dependent			Variables		
	State Anger (Mediator)			Intention to Aggress		
	B	SE	95% CI	B	SE	95% CI
Agreeableness	-1.08	.23	[-1.54, -.63]	-.58	.24	[-1.06, -.11]
State Anger (M)				.57	.08	[.41, .73]
Covariates						
Attractiv. of Lisa	.17	.08	[.00, .34]	.07	.08	[-.10, .22]
SRD	.03	.56	[-1.08, 1.14]	1.02	.54	[-.06, 2.09]
SRV	-.00	.02	[-.05, .05]	.00	.02	[-.04, .05]

*Note.* N= 151, SE= Standard Error, SRD= Self-reported Delinquency, SRV= Self-reported Victimization

The same procedure was conducted with Emotionality as the independent variable. When regressing the mediators on Emotionality, no significant coefficient was found (see Table 5). When Emotionality and the mediators were regressed on Intention to Aggress, State Anger was found to have a significant effect while State Anxiety did not. The bootstrap procedure showed a non-significant indirect effect of Emotionality, through State Anger, on Intention to Aggress (B=.23, SE=.28, 95% CI [-.26, .85]). Thereby, indicating that State Anger does not mediate the relation between Emotionality and the Intention to Aggress. Further, the bootstrap procedure showed a non-significant indirect effect of Emotionality, through State Anxiety, on Intention to Aggress (B=-.14, SE=.10, 95% CI [-.37, .00]). Thus, indicating that State Anxiety does not mediate the relation between Emotionality and the Intention to aggress. Accordingly, the results show no support for hypothesis 5 as no significant mediation effect was found.

**Table 5.** *Unstandardized Regression Coefficients with Standard Errors 95% Confidence Intervals (CIs) estimating the Relations between the Predictor Emotionality, the Mediators State Anger and State Anxiety, and the Outcome Variable Intention to Aggress with SRD, SRV and Attractiveness of Lisa as Covariates (Simple Mediation).*

Independent Variable	Dependent Variables								
	State Anger (Mediator)			State Anxiety (Mediator)			Intention to Aggress		
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI
Emotionality	.31	.28	[-.25, .86]	.56	.25	[-.07, 1.05]	.11	.26	[-.40, .62]
State Anger (M)							.75	.09	[-.58, .92]
State Anxiety (M)							-.24	.10	[-.44, -.05]
Covariates									
Attractiv. of Lisa	.13	.09	[-.05, .30]	.14	.08	[-.01, .30]	.05	.08	[-.12, .21]
SRD	.55	.59	[-.63, 1.70]	-.24	.52	[-1.27, .79]	1.12	.54	[-.06, 2.19]
SRV	.00	.03	[-.05, .05]	.01	.02	[-.03, .06]	.01	.02	[-.04, .06]

*Note.* N= 151, SE= Standard Error, SRD= Self-reported Delinquency, SRV= Self-reported Victimization

## Discussion

The aim of this paper was threefold. First, the aim was to replicate the results of Van Gelder et al. (2019) regarding Realism and Presence in a VR scenario vs. a written scenario. Second, the study intended to test to what extent Emotionality, Agreeableness, State Anger, and State Anxiety have an effect on an individual's Intention to Aggress. Third, it was tested whether emotional states mediate the relation between personality traits and Intentions to Aggress.

In the study, participants were randomly assigned to either the VR - or the written scenario condition. Participants in the first condition were asked to watch a 360° video of a barfight scenario on a HMD. The second condition asked the participants to read the same scenario in form of a text presented to them on a laptop. Both groups, after experiencing the scenarios, filled out questionnaires.

While Realism refers to how real the participants perceived the scenario, Presence refers to the individuals experience of being in the scenario itself (Van Gelder et al., 2014). The current study found that participants scored higher on both Realism and Presence in the VR-condition, corresponding with the findings of Van Gelder et al. (2019). Moreover, the Intention to Aggress was also found to be higher in participants of the VR-condition in comparison to those who read the scenario. Additionally, participant scores on State Anger were found to be similar in both conditions. Furthermore, adding to the results of Van Gelder et al. (2019), State Anxiety was found to be similar in both conditions.

Both Realism and Presence have been found to correlate with each other in the current study. This is in line with Witmer and Singer (1998), who found that the more realistic a person's perception of a scenario is, the more that person will immerse him- or herself in VR (see also Slater, Khanna, Mortensen, & Yu, 2009).

To examine what predicts the Intention to Aggress, the traits Emotionality and Agreeableness and the states Anger and Anxiety, were included in the research. Both traits and State Anger have been linked to aggressive behaviour in previous studies (Brezina et al., 2001; Jones et al., 2011; Miller et al., 2003; Scarpa and Raine, 1997; Van Gelder and De Vries, 2012). Further, based on the research of Lerner and Keltner (2001), it was expected that being anxious reduces an individual's Intention to Aggress. In the current study, both states have been found to have a direct effect on Intention to Aggress. While State Anxiety had a negative effect, State Anger had a positive effect. The findings related to State Anger were in accord with findings of Van Gelder and De Vries (2012), while the findings related to State Anxiety were in accord with the current studies expectations.

Based on the results of this study, it seems likely that individuals in an angry state are more inclined to engage in aggressive behaviour compared to individuals in an anxious state. According to Paternoster and Pogarsky (2009), the decision to engage in a criminal act is influenced by cost-benefit assessment of the act itself. Research suggests that those assessments are influenced by the emotional states a person is in (Van Gelder & De Vries, 2012). Being in an anxious state makes one more aware or sensitive to the risks of an act while the opposite can be seen for individuals that are in an angry state (Lerner & Keltner, 2001). The results of the current study are in accord with this research.

While both State Anger and State Anxiety were found to have a significant effect on Intention to Aggress, Emotionality was found to not have any significant effect. The findings suggest that scores on Emotionality do not predict Intention to Aggress. According to Jones et al. (2011), Emotionality is one of three personality traits that have been linked to criminal behaviour. Van Gelder et al. (2012) found a direct and indirect effect of Emotionality on criminal decision making. The findings of this study contradict those findings. However, the current study did not test the effect on criminal decision making but rather on the intention to conduct aggressive behaviour. Nevertheless, Emotionality has also been linked to so-called reactive or provoked aggression (Book, Visser, Volk, Holden & D'Agata, 2019; Dinić & Wertag, 2018; Knight, Dahlen, Bullock-Yowell & Madson, 2018). However, a study by Dinić and Wertag (2018) found that the link between reactive aggression and Emotionality had only a significant effect for females. Thereby, the reason why, in this study, Emotionality was not found to have a significant effect on Intention to Aggress could be explained, as only male participants were used. Furthermore, the results of the current study did not show any mediation effect of State Anger or State Anxiety on Emotionality's effect on Intention to Aggress.

Agreeableness was found to have a negative direct effect on Intention to Aggress. Those findings are in accordance with findings of previous studies that have linked low scores on Agreeableness to criminal and aggressive behaviour (Jones et al., 2011; Miller et al., 2003; Miller et al., 2008). Individuals scoring low on Agreeableness are often described as quick to anger, manipulative and arrogant. Thus, they are more likely to engage in antisocial and aggressive behaviour (Miller et al., 2003).

Further, as expected, it was found that State Anger mediated the effect of Agreeableness on Intention to Aggress. The mediation effect is positive, meaning that individuals who score lower on Agreeableness are more likely to pursue aggressive behaviour

when angered. Previous findings of different studies already led to the suggestion that people who score low on Agreeableness are quickly angry as well as more likely to engage in aggressive behaviour, for example if provoked (Ashton et al., 2014; Jones et al., 2011; Miller et al., 2003; Miller et al., 2008; Van Gelder & De Vries, 2012). The current study adds to these findings. It appears that individuals that score low on Agreeableness are more likely to get angry and through that anger are even more inclined to use aggressive behaviour than they would normally. Future studies could examine which facet of Agreeableness is most affected by high scores on State Anger. This notion is in accord with the suggestions of Miller et al. (2008), who argues that rather than investigating broad personality domains, research should focus more on the different sub-traits or facets as they might be linked differently to the construct under investigation.

To sum it up, the results indicate several things. First, the scores on Presence and Realism indicate that participants perceived VR as more realistic and had a higher feeling of being in the scenario. Second, higher scores on State Anger, State Anxiety and Intention to Aggress seem to indicate that the emotional reactions of the participants represent emotions they would feel in a similar real-life situation more closely. Third, State Anger, State Anxiety and Agreeableness were found have an effect on Intention to Aggress. However, Emotionality was not found to have an effect. Fourth, the findings of the current study indicate that State Anger explains part of the effect of Agreeableness on Intention to Aggress.

### **Strength and Limitations**

A potential threat to the validity of the current study might be that the item controlling for the sexuality of the participants was not included. Hence, the results could be influenced as potential homosexual participants are likely to have a different emotional reaction to the scenario than heterosexual man. Further, the current study had no forced answer for its questionnaire, thereby several participants had to be excluded since they did not respond to every question. However, if included, forced answer could have had a similar effect, as participants who feel uncomfortable answering every question probably would have stopped the study entirely. Therefore, this is only seen as a minor limitation.

While the current study has certain limitations, it also has a major strength. It aimed, among others, on replicating the results of Van Gelder et al. (2019). This aim was achieved as most of the results, except for the Attractiveness of Lisa, were nearly identically replicated, even though the context of both studies can be seen as very different. Van Gelder et al. (2019) conducted their study at the Lowlands Festival 2015 in the Netherlands. The participants

differed in several aspects from the ones used in the current study. The age range and educational level of the participants were different. Partly, the participants of the study of Van Gelder et al. (2019) were under the influence of drugs or alcohol. Further, the setting was noisy. In comparison, the current study mainly used students, indicating that all of them were about the same age and have about the same educational level. Further, none of the participants, to the knowledge of the researcher, were under the influence of any drugs. The setting was more controlled and freer from outside disturbance. If the difference in the setting would have had a large effect on the results, the question would arise if the results of both studies could be seen as valid. Nevertheless, the results of Van Gelder et al. (2019) were largely replicated and thus the validity of the results of both studies was increased.

### **Conclusion and Recommendations**

In their article, Van Gelder et al. (2019) argue that VR-scenarios could be used more often in criminal research than the traditional method of written scenarios. The results of the current study further underline this notion. In general, it seems that participants' reactions to a VR scenario are closer to real life reactions than those of participants that read about the same scenario.

Not only do the results of the current study strengthen the argument that VR could be used more often in criminal research, but they also provide research data that could be used as a basis to develop preventive interventions that focus on individuals that have a higher intention to aggress. Similar to the current study, participants (emotional) reactions to different scenarios, for example a burglary, in VR could be examined. Thereby, situations that are likely to trigger aggressive behaviour as well as personally traits and emotional states related to aggressive behaviour can be studied in a controlled environment. Thus, data could be gathered on what predicts and influences an individual's intention to aggress most. With the help of such data developing interventions, that are aimed to reduce aggressive behaviour, might have a higher chance to be of success. The increasing technological advances, especially in the field of VR, are likely to make the technology cheaper, therefore better accessible for more people, as well as increase the quality of the experience. That in turn will further increase the benefits of using VR as a research tool in criminal and psychological science.



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## Appendix

### Appendix A: Questionnaires for Demographics

1	Wat is je leeftijd?	Invullen
2	Welke opleiding volg je?	Invullen
3	Wat is je geslacht?	m/v
4	Heb je op dit moment een relatie, en zo ja hoe lang heb je deze relatie?	ja....maanden/nee

### Appendix B: Questionnaire for Attractiveness of Lisa

Hoe aantrekkelijk vind je Lisa (1=Helemaal niet aantrekkelijk – 7 = Zeer aantrekkelijk)

### Appendix C: Questionnaire for Realism and Presence

#### Antwoordcategorieën

- 1 = Helemaal mee oneens
- 2 = Mee oneens
- 3 = Neutraal (noch mee eens, noch mee oneens)
- 4 = Mee eens
- 5 = Helemaal mee eens

#### Presence and Involvement

- 1 Het scenario had een grote impact op mij.
- 2 Ik had het gevoel dat ik deel uitmaakte van het scenario.
- 3 Ik voelde mij een passieve toeschouwer.
- 4 Ik moest mij inspannen om te volgen wat er gebeurde.
- 5 Ik ervaarde emoties bij de gebeurtenissen in het scenario.
- 6 Ik voelde mij emotioneel betrokken bij de situatie.
- 7 Ik had het gevoel aanwezig te zijn in de situatie.
- 8 Ik had het gevoel dat ik mij daadwerkelijk in de situatie bevond.
- 9 Ik bleef mij bewust van mijn echte omgeving.
- 10 Ik ging helemaal op in het scenario.
- 11 Ik kon mij inleven in de situatie.
- 12 Ik had het gevoel dat ik helemaal in het scenario zat
- 13 Ik kon mij niet goed identificeren met de hoofdpersoon in het scenario.

#### Realism

- 1 Ik had het idee dat het scenario fictief was.
- 2 Ik vond het scenario overtuigend.
- 3 De situatie was realistisch.
- 4 Het scenario was begrijpelijk.
- 5 Het scenario was duidelijk.
- 6 Het scenario kwam echt op mij over.
- 7 Ik werd misselijk tijdens het kijken van het scenario **[ALLEEN VOOR FILMCONDITIE]**

# A BARFIGHT IN VIRTUAL REALITY: ASSESSING THE EFFECTS OF EMOTIONAL STATES AND PERSONALITY TRAITS ON THE INTENTION TO AGGRESS

## Appendix D: Questionnaire for Anxiety, Anger, Guilt/Shame, Risky Choice and Perceived Risk, Intention to Aggress

- 1 Hoeveel plezier zou het je geven om deze persoon aan te pakken met geweld (met geweld wordt steeds bedoeld: duwen, slaan of schoppen)? (1= Helemaal geen plezier- 7= Heel veel plezier)
- 2 Hoe goed zou het voelen om hem aan te pakken door hem te duwen te slaan of te schoppen? ? (1=Helemaal niet goed- 7= Heel erg goed)
- 3 Hoe erg vind je het om gezichtsverlies te lijden in deze situatie? (1=Helemaal niet erg- 7= Heel erg)
- 4 In hoeverre is het ethisch om in deze situatie geweld (dus duwen, slaan of schoppen) te gebruiken? (1= helemaal niet ethisch-7= heel ethisch)
- 5 Ik hoeverre vind je het moreel aanvaardbaar om geweld te gebruiken? (1=helemaal niet aanvaardbaar-7=geheel aanvaardbaar)
- 6 Hoe ernstig kunnen de negatieve gevolgen voor jou zijn als je geweld gebruikt? (1 = Helemaal niet ernstig - 7 = Zeer ernstig)
- 7 Hoe groot is de kans op een slechte afloop voor jou als deze ruzie eindigt in geweld? (1 = Erg klein - 7= Erg groot)
- 8 Hoe vervelend vind je het als het slecht voor je afloopt? (1 = Geenszins vervelend - 7 = Zeer vervelend)
- 9 Hoe waarschijnlijk is het dat het gebruiken van geweld negatieve gevolgen voor je heeft? (1 = Zeer onwaarschijnlijk - 7 = Zeer waarschijnlijk)
- 10 Zou de situatie je een onzeker gevoel geven? (1 = Helemaal niet - 7 = Heel erg)
- 11 Zou je kwaad zijn? (1 = Helemaal niet - 7 = Heel erg)
- 12 Zou je bang zijn? (1 = Helemaal niet - 7 = Heel erg)
- 13 Zou je boos zijn in deze situatie? (1 = Helemaal niet - 7 = Heel erg)
- 14 Zou je je zorgen maken? (1 = Helemaal niet - 7 = Heel erg)
- 15 Zou je geïrriteerd zijn? (1 = Helemaal niet - 7 = Heel erg)
- 16 Zou je nerveus zijn? (1 = Helemaal niet - 7 = Heel erg)
- 17 Zou je woedend zijn? (1 = Helemaal niet - 7 = Heel erg)
- 18 Roept de situatie negatieve gevoelens in het algemeen bij je op? (1 = Helemaal niet - 7 = Heel erg)
- 19 Zou je je gefrustreerd voelen? (1 = Helemaal niet - 7 = Heel erg)
- 20 Zou je je later schuldig voelen als je geweld zou gebruiken? (1 = Helemaal niet - 7 = Heel erg)
- 21 Zou je je later schamen als je geweld zou gebruiken? (1 = Helemaal niet - 7 = Heel erg)
- 22 Hoe waarschijnlijk is het dat jij in deze situatie geweld de andere persoon aan zou pakken door hem te duwen, te slaan, of te schoppen? ( 1 = Zeer onwaarschijnlijk - 7 = Zeer waarschijnlijk)
- 23 Kan je een schatting geven in procenten van de kans dat je geweld zou gebruiken (dus duwen, slaan of schoppen)? Ik schat die kans op X% **[HIER MOETEN DEELNEMERS DUS EEN PERCENTAGE INVULLEN]**
- 24 Hoeveel zin heb je om de persoon aan te pakken door hem te slaan, te duwen of te schoppen? (helemaal geen zin-heel veel zin)
- 25 Hoe waarschijnlijk is het al met al dat deze situatie zal eindigen in een vechtpartij tussen jullie?
- 26 Kan je een schatting geven in procenten van de kans dat de ruzie eindigt in een vechtpartij? Ik schat die kans op X% **[HIER MOETEN DEELNEMERS DUS EEN PERCENTAGE INVULLEN]**

# A BARFIGHT IN VIRTUAL REALITY: ASSESSING THE EFFECTS OF EMOTIONAL STATES AND PERSONALITY TRAITS ON THE INTENTION TO AGGRESS

## Appendix E: Questionnaire for Agreeableness, Emotionality and Honesty

		1 = Helemaal mee oneens
		2 = Mee oneens
		3 = Neutraal (noch mee eens, noch mee oneens)
		4 = Mee eens
		5 = Helemaal mee eens
3	Aforg1	Ik houd zelden een wrok tegen iemand, zelfs niet als ik erg slecht behandeld ben.
5	Efear1	Ik zou bang worden als ik in slecht weer zou moeten reizen.
6	Hsinc1	Als ik iets wil van iemand die ik niet mag, dan zou ik me erg vriendelijk gedragen om het te krijgen.
9	Agent4	Mensen vertellen me soms dat ik te kritisch op anderen ben.
11	Eanxi1	Ik maak me soms zorgen over onbenulligheden.
12	Hfair1	Als ik niet gepakt zou worden, dan zou ik er geen probleem mee hebben om een miljoen Euro te stelen.
15	Aflex1	Mensen vertellen me soms dat ik te koppig ben.
17	Edepe3	Na een pijnlijke ervaring heb ik iemand nodig om me te troosten.
18	Hgree2	Veel geld bezitten vind ik onbelangrijk.
21	Apati2	Mensen vinden me een heethoofd.
23	Esent1	Ik voel tranen opkomen als ik anderen zie huilen.
24	Hmode2	Ik ben een gewoon persoon, niet beter dan anderen.
27	Aforg3	Mijn houding ten aanzien van mensen die mij slecht behandeld hebben is "vergeven en vergeten".
29	Efear4	Het kan mij niet schelen om gevaarlijke klussen uit te voeren.
30	Hsinc4	Ik zou niet vlieën om op het werk opslag of promotie te krijgen, zelfs al zou het succes hebben.
33	Agent5	Over het algemeen accepteer ik zonder klagen andermans gebreken.
35	Eanxi4	Ik maak me veel minder zorgen dan de meeste mensen.
36	Hfair4	Ik zou in de verleiding gebracht worden om gestolen waren te kopen als ik in financiële nood zou zitten.
39	Aflex5	Ik ben gewoonlijk vrij flexibel in mijn opvattingen als mensen het met mij oneens zijn.
41	Edepe6	Moeilijke situaties kan ik aan zonder emotionele steun van anderen nodig te hebben.
42	Hgree4	Ik zou graag in een zeer rijke, sjeke buurt wonen.
45	Apati3	Ik ben zelden boos, zelfs als mensen me behoorlijk slecht behandelen.
47	Esent2	Als iemand die ik ken ongelukkig is, voel ik zelf bijna diens pijn.
48	Hmode3	Ik zou niet graag willen dat mensen me behandelen alsof ik beter ben dan zij.
51	Aforg7	Als iemand mij eens bedrogen heeft, zal ik altijd achterdochtig blijven.
53	Efear7	Als het gaat om fysiek gevaar, ben ik een angsthaas.
54	Hsinc5	Als ik iets van iemand wil, lach ik om diens slechtste grappen.
57	Agent6	Ik heb de neiging andere mensen mild te beoordelen.
59	Eanxi6	Ik heb zelden of nooit slaapproblemen door stress of angst.
60	Hfair6	Ik zou nooit ingaan op een poging tot omkoping, zelfs niet als het om een erg hoog bedrag ging.
63	Aflex7	Als mensen mij vertellen dat ik het mis heb, is mijn eerste reactie dit aan te vechten.
65	Edepe7	Wanneer ik over iets inzigt, wil ik het liefst met iemand mijn zorgen delen.
66	Hgree5	Ik zou graag gezien worden terwijl ik rondrijd in een erg dure auto.
69	Apati4	De meeste mensen hebben de neiging sneller boos te worden dan ik.
71	Esent3	Ik raak erg geëmotioneerd als iemand die me na staat voor een lange tijd weg gaat.
72	Hmode6	Ik vind dat ik meer recht op respect heb dan de gemiddelde persoon.
75	Aforg8	Ik vind het moeilijk iemand volledig te vergeven die gemeen tegen mij is geweest.
77	Efear8	Zelfs in crisissituaties blijf ik rustig.
78	Hsinc6	Ik zou niet net doen alsof ik iemand mag om te zorgen dat die persoon mij een dienst bewijst.
81	Agent7	Zelfs als mensen veel fouten maken, zeg ik zelden iets negatiefs.
83	Eanxi8	Ik word erg gespannen als ik moet wachten op een belangrijke beslissing.
84	Hfair8	Ik zou in de verleiding komen om vals geld te gebruiken als ik er zeker van was dat ik er mee weg zou komen.
87	Aflex8	Ik vind het moeilijk compromissen te sluiten als ik denk dat ik gelijk heb.
89	Edepe8	Ik bespreek zelden mijn problemen met anderen.
90	Hgree7	Ik zou veel plezier beleven aan het bezit van dure luxe goederen.
93	Apati6	Ik vind het moeilijk niet boos te worden als mensen mij beledigen.
95	Esent7	Ik raak niet snel geëmotioneerd, zelfs niet in situaties waarin anderen erg sentimenteel worden.
96	Hmode8	Ik wil dat mensen weten hoe belangrijk ik ben.

# A BARFIGHT IN VIRTUAL REALITY: ASSESSING THE EFFECTS OF EMOTIONAL STATES AND PERSONALITY TRAITS ON THE INTENTION TO AGGRESS

## Appendix F: Questionnaire for Self-Reported Delinquency

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**Antwoordcategorieën**

1 = nooit  
2 = 1-2 keer  
3 = 3-5 keer  
4 = 6-10 keer  
5 = meer dan 10 keer

Hoe vaak heb je in de afgelopen 2 jaar (d.w.z. sinds Mei 2017)....

- 1 ...muren, deuren of iets anders beklad met een spuitbus of stift?
- 2 ...iets dat niet van jou was kapot gemaakt of beschadigd?
- 3 ...iets in brand gestoken?
- 4 ...iets uit een winkel gestolen dat minder dan 5 euro waard was?
- 5 ...iets uit een winkel gestolen dat meer dan 5 euro waard was (bijvoorbeeld kleren, dvd's of iets anders)?
- 6 ...iets van iemand gekocht waarvan je wist of dacht dat het gestolen was (bijvoorbeeld een fiets, telefoon, tablet, kleding of iets anders)?
- 7 ...een fiets gestolen?
- 8 ...een scooter of brommer gestolen?
- 9 ...ingebroken in een huis om iets te stelen?
- 10 ...een auto opengebroken om iets te stelen?
- 11 ...ergens anders ingebroken om iets te stelen (bijvoorbeeld in een winkel, school of bedrijf)?
- 12 ...iemand beroofd of overvallen?
- 13 ...iets van iemand anders gestolen of afgepakt (bijvoorbeeld geld, een telefoon, kleding of iets anders)?
- 14 ...iemand bedreigd om die persoon bang te maken, iets te laten doen, of iets van hem of haar af te pakken?
- 15 ...op straat iemand geschopt of geslagen?
- 16 ...iemand geslagen of geschopt waardoor die persoon gewond is geraakt?
- 17 ...drugs zoals wiet of hasj verkocht, ergens anders dan in een coffeeshop?
- 18 ...drugs zoals XTC, cocaïne of speed verkocht of gebruikt?
- 19 ...een mes of een ander wapen bij u gedragen?
- 20 ...een mes of een ander wapen gebruikt?
- 21 ... in vechtpartij beland
- 22 ... met iemand gevochten
- 23 Hoe vaak bent u in de laatste 12 maanden zelf betrokken geweest bij een vechtpartij?
- 24 Hoe vaak bent u in de laatste 12 maanden zodanig gewond geraakt bij een vechtpartij dat u behandeld moest worden door een arts of verpleger?

## Appendix G: Questionnaire for Self-Reported Victimization

**Antwoordcategorieën :**

1 = nooit  
2 = 1-2 keer  
3 = 3-5 keer  
4 = 6-10 keer  
5 = meer dan 10 keer

Hoe vaak heb je in de afgelopen 2 jaar (d.w.z. sinds Mei 2017)....

- 1 ...opzettelijk geld dat hij/zij u schuldig was of spullen die hij/zij van u had geleend niet teruggegeven?
- 2 ...een inbraak, of poging tot inbraak, in uw woning gepleegd?
- 3 ...een inbraak, of poging tot inbraak, in uw auto gepleegd?
- 4 ...iets van u moedwillig vernield of beschadigd, zonder dat daarbij iets is gestolen? Denk daarbij bijvoorbeeld aan uw fiets, spullen, huis, auto, etc.  
...iets van u gestolen, zonder dat daarbij geweld werd gebruikt of met geweld werd bedreigd? Bijvoorbeeld uw fiets, telefoon, tas, auto, camera, iets uit uw auto, portemonnee, sieraden, kleding, etc. (Het gaat hierbij om persoonlijk sactofferschap van zakkenrollerij).
- 5 ...iets van u gestolen waarbij de dader wel geweld tegen u gebruikte of hiermee dreigde? Bijvoorbeeld uw fiets, laptop, telefoon, tas, auto, camera, iets uit uw auto, portemonnee, sieraden, kleding, etc. (Het gaat hierbij om persoonlijk slachtofferschap van (straat)roof).
- 6 ...u geslagen, een (harde) duw gegeven, geschopt of een wapen (zoals een mes, stuk hout, schaar, etc.) tegen u gebruikt?
- 7 ..., een bekende of onbekende, u op een ongewenste manier aangeraakt of vastgepakt met seksuele bedoelingen (bijvoorbeeld thuis, op het werk, op straat, in de sportschool, in een café, etc.)?
- 8 ..., een bekende of onbekende, u bedreigd of geïntimideerd, zonder dat u werd aangevallen of mishandeld? Dit kan verbaal zijn of met een wapen (mes, vuurwapen, schaar, etc.) of een ander voorwerp en zowel in de huiselijke sfeer als daarbuiten.
- 9 ...u uitgescholden (bijvoorbeeld thuis, op straat, op het werk of op de universiteit, in een discotheek, in de openbare ruimte, in een café, op een sportvereniging, etc.)?
- 10 ...u het gevoel gegeven dat u gediscrimineerd werd (bijvoorbeeld thuis, op straat, op het werk of op de universiteit, in een discotheek, in de openbare ruimte, in een café, op een sportvereniging, etc.)?
- 11 ..., een bekende of onbekende, u opgelicht of bedrogen? Dat wil zeggen: verkeerd geïnformeerd over iets, informatie voor u achtergehouden of de waarheid verdraaid om iets van u gedaan te krijgen.
- 12 ..., een bekende of onbekende, uw digitale privacy geschonden? Dat wil zeggen: ingebroken in uw computer of uw wachtwoorden van persoonlijke pagina's achterhaald.
- 13 ...u slachtoffer gemaakt van geweld of criminaliteit op een andere manier dan de soorten die hierboven reeds zijn genoemd? Om welk(e) soort(en) geweld of criminaliteit ging dit?
- 14



Appendix H: The Scenario

Een avond in Molly Malone's

*Stel je voor:* Het is vrijdagavond en je bent samen met je vriendin Lisa in de Ierse Pub "Molly Malone's" in het Centrum van Amsterdam. Je bent met Lisa, met wie je alweer twee jaar samen bent, naar Molly's gegaan om wat te eten. Het eten was heerlijk en jullie hebben er ook een goed glas wijn bij gedronken. Jullie besluiten na het hoofdgerecht niet nog een dessert of koffie te nemen maar om naar huis te gaan. Je loopt naar de bar om daar af te rekenen. De barman vraagt of het gesmaakt heeft terwijl hij je de rekening van €47 geeft. Je zegt dat het heerlijk was, betaalt met een briefje van €50 en zegt dat hij het wisselgeld mag houden. Terwijl je vervolgens terug naar je tafel loopt zie je dat een man van ergens begin twintig die je niet kent met Lisa staat te praten. Terug bij je tafel aangekomen hoor je hem haar telefoonnummer vragen. Dan ontstaat de volgende dialoog tussen jou en hem die snel uit de hand loopt:

JIJ: "Wat is dit? Sta jij mijn vriendin te versieren?"

MAN: (blijft Lisa aankijken) "Ze heeft toch geen ring om? Dan kan ze toch praten met wie ze wil?"

JIJ: "Kom Lisa, we gaan."

MAN: (tegen jou) "Misschien moet jij maar eens gaan."

JIJ: (met nadruk) "Ik heb het niet tegen jou!"

MAN: (draait zich naar jou toe): "Maar ik wel tegen jou"

JIJ: (met stemverheffing) "Rot op man!"

MAN: (ook met stemverheffing) "Rot zelf op!"

JIJ: (dreigend) "En nu moet je ophouden!"

MAN: (uitdagerig) "Of wat?"