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Exploring Dissociation as a Facilitator of Suicide Risk Using Virtual Reality

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EXPLORING DISSOCIATION AS A FACILITATOR OF SUICIDE RISK USING

VIRUTAL REALITY

by

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A Thesis
Submitted to the Graduate School,
the College of Education and Human Sciences
and the School of Psychology
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in Partial Fulfillment of the Requirements
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ABSTRACT

Research shows that suicidal behavior is not a result of a single cause or single event, but instead is an interaction of facilitators. One potential facilitator that needs further exploration is dissociation. Dissociation has been consistently linked to suicidal behavior, and treatment for dissociative disorders seem to be associated with a reduction of suicidal ideation and suicide attempts. Prior theories have posited that dissociation increases the possibility of a suicidal act because of intensified disconnect from the body. However, these theories do not indicate whether dissociation is a facilitator of suicide risk by increasing suicidal ideation, attempt behaviors, and capability for suicide. Additionally, unique considerations of working with suicidal individuals have caused suicide research to lag behind research where laboratory manipulation is possible. Virtual Reality (VR) technology is potentially a translational approach to studying suicide causes. Undergraduate psychology students (n = 145) recruited through USM's SONA pool completed either a dissociation induction task (experimental) or a neutral virtual reality experience (control) and then decided whether to engage in a virtual suicide option. Results showed that those who reported higher dissociation scores also reported higher suicide risk and capability for suicide. However, those with higher acute dissociation scores did not significantly predict engaging in virtual suicide. Results indicate that it is possible certain facets of dissociation (i.e., depersonalization and derealization) may be more relevant when assessing suicide risk. In conclusion, dissociation should be considered as a factor in the assessment and treatment of suicide risk.

ACKNOWLEDGMENTS

DEDICATION

I would like to dedicate this thesis to my mother, Denise Patricia Caulfield, who tragically passed away 9 months ago. Mom, you are my continual hope and give me the strength to finish this journey. Thank you for being my ultimate inspiration. I love and miss you forever.

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LIST OF ABBREVIATIONS

ADI	Acute Dissociative Index
DES-II	Dissociative Experiences Scale-II
IPT	Interpersonal Theory of Suicide
VR	Virtual Reality

CHAPTER I - INTRODUCTION

Suicide is a leading cause of death, accounting for approximately 800,000 deaths worldwide (World Health Organization, 2017). Prior research has provided evidence of many risk factors that correlate with suicidal ideation (e.g., stressful life events, psychopathology, hopelessness); however, these factors only weakly predict suicidal behaviors (Kessler, Borges, & Walters, 1999; Franklin et al., 2016). Indeed, suicidal behavior is not based on a single cause; instead, it is an outcome based on several interactive effects of demographic, personality, and environmental variables that help facilitate suicide risk (Hawton & Van Heeringen, 2009; Mann et al., 1999; Orbach, 2003). Orbach (2003) and Joiner (2005) proposed that facilitators for suicide may lower constraints from self-destructive behaviors and thoughts about death, which may increase the risk of choosing suicide instead of other coping mechanisms (Shelef, Levi-Belz, & Fruhter, 2014). Thus, it is vital to continue to explore probable facilitators that might predict the transition of suicidal thoughts to a suicide attempt.

One potential facilitator for suicide risk is dissociation. Dissociation has consistently been understood as disruptions of identity, consciousness, reality, and control, often causing altered perceptions of the self and the outside environment (Lanius et al., 2012). This perception often allows a sense of disconnect or impairment in memory about the self or outside world (van Heugten-van der Kloet, Cosgrave, van Rheede, & Hicks, 2018). The phenomenon of dissociation was first described by Pierre Janet in 1889, who found symptoms to be especially prevalent in patients with hysteria (Janet, 1889; van der Hart & Horst, 1989). Dissociative disorders are relatively rare within the population (van Heugten–van der Kloet et al., 2018). A recent study using DSM-IV

criteria examined the prevalence of dissociative disorders in women in the general

population (n=628), and rates ranged from 0.2% for dissociative fugue (a specifier of

dissociative amnesia in the DSM-5) to 8.3% for dissociative disorders not otherwise

specified, (DID: 1.1%; DA: 7.3%; depersonalization disorder: 1.4%; Sar et al., 2007).

The clinical utility of the DSM classification of dissociative disorders has been under

debate (Calati, Bensassi, & Courtet, 2017) because the symptomatology patients express

do not often correspond to any of the dissociative disorders (Calati et al., 2017). While

this is the case for dissociative disorders, dissociation symptoms are ubiquitous and

experienced by many in everyday experiences, falling on a spectrum of daydreaming to

hallucinations (Calati et al., 2017).

Dissociation includes multiple components that are usually grouped into two main

categories: compartmentalization symptoms and detachment symptoms (Rossi et al.,

2019). Compartmentalization symptoms, including dissociative amnesia, and absorption

and consumption, refers to when one's mental processes are not unified, and people's

decisions are not entirely under their voluntary control. Detachment symptoms refer to

altered states of consciousness where one feels detached or separated from their everyday

experiences. Two of the most common detachment symptoms are depersonalization and

derealization (van Heugten-van der Kloet et al., 2018). Depersonalization is a feeling of

detachment from the self and the body and is often described as floating above

themselves while observing their actions (van Heugten-van der Kloet et al., 2018).

Derealization involves feeling as though the external world is unreal or altered like one is

in a dream. Depersonalization and derealization symptoms have been highly discussed in

the context of PTSD (Lanius et al., 2012). These symptoms occur during several

experiences (e.g., daydreaming, sleep deprivation, drugs); however, the highest levels are consistently linked to experiencing traumatic events such as child sexual abuse, as well as child physical abuse and adult trauma (Bremner et al., 1993).

Recent research has focused on dissociation within posttraumatic stress disorder (PTSD) after the DSM-5 recently added a dissociative subtype of PTSD (Gershuny & Thayer, 1999; APA, 2013). To meet the criteria for the dissociative subtype, individuals must additionally report persistent or recurrent symptoms of depersonalization (e.g., feelings of disconnectedness or detachment from the body) and derealization (e.g., feelings of unreal surroundings; Hansen, Ross, & Amour, 2017). However, literature has previously suggested that dissociation is not an integral part of the development of PTSD (Amour, Karstoft, & Richardson, 2014). Nevertheless, other research shows that those who exhibit a high amount of dissociation after a traumatic event are more likely to express PTSD symptoms (Amour et al., 2014). In a study by Armour and colleagues (2014), those diagnosed with the dissociative subtype of PTSD (13.1% of the sample) expressed higher scores on measures of anxiety, depression, hostility, and sleeping difficulties. Previous studies have assessed several factors that might distinguish dissociative PTSD from severe PTSD, including demographic factors, prior trauma, comorbidity with prevalent disorders such as depression and specific phobia, number of current diagnoses, and presence of personality disorders (Wolf et al., 2012; Armour, Elklit, Lauterbach, & Elhai, 2014). Thus, it seems that while dissociation might be important to the development and maintenance of PTSD, it is also a prominent factor is other disorders as well.

Despite the recent focus of dissociation within PTSD, dissociation can be considered transdiagnostic, as it is a factor for the development and maintenance of multiple disorders such as schizophrenia, depression, bulimia, and PTSD (Calati et al., 2017). Notably, all these disorders are also associated with elevated suicide risk, but further examination is necessary to understand whether dissociation leads to the facilitation of suicide ideation to attempt for these disorders (Calati et al., 2017). Several studies found correlations between dissociation and self-harm behavior (e.g., Batey, May, & Andrade, 2010; Gratz, Conrad, & Roemer, 2002), and treatment for dissociative disorders seem to be associated with a reduction of suicidal ideation and suicide attempt (Brand et al., 2009; 2013). Also, recent studies have shown that dissociation, capability for suicide, and high subjective stress, were unique to Israeli soldiers who attempted suicide (Shelef et al., 2014). Notably, there seems to be growing evidence that dissociation may be a pertinent factor for suicide attempts. Researchers have found that dissociation significantly predicted those who attempted suicide over those who ideated (Levinger et al., 2015; Webermann et al., 2016), and when compared to psychiatric controls (Mergler et al., 2017). Therefore, it is vital to further understand the role of dissociation as a potential facilitator for suicidal ideation to attempt, particularly in populations with high levels of trauma (Cloitre, Petkova, Wang, & Lu, 2012).

Three main theories have attempted to explain the association between dissociation and suicide risk. First, Schneidman (1980) proposed that dissociation leads to the development of a constriction of options and tunnel vision, leading to the suicidal process. Baumeister (1990) described dissociation as cognitive deconstruction, decreasing inhibition to suicidal behavior, and increasing the willingness to escape using

suicide. Finally, Orbach (1994) hypothesized that dissociation was related to insensitivity to pain and indifference to the body, rendering a suicidal act as possible. After experiencing a traumatic event, the interaction of detachment from the body and repeated exposure to physical pain may facilitate seeing suicide as an option (Orbach, 1996). Orbach recognized that an essential limitation to these theories was that it only explains those who die by suicide using violent means. Thus, there is still a need to understand the role of dissociation in suicide ideation and attempt further.

Since the development of these theories, new theories have been posited attempting to explain suicide. One of the most popular theories is the interpersonal theory of suicidal behavior (Joiner, 2005), which asserts that individuals will not die by suicide unless they have the desire and means to do so. According to this framework, the desire to die by suicide comes from two specific psychological states called perceived burdensomeness (feeling like one is a burden to others) and thwarted belongingness (feeling alienated from others); however, people will not act on these suicidal desires unless they also possess a capability for suicide (Joiner, 2005). People develop capability through prior experiences of pain or violence, such as exposure to war or crime, or experiencing prior self-injury (Joiner, 2005). This theory has continuously been studied and shown to be fundamental in understanding suicidal ideation and attempt; however, it is possible that dissociation is a piece to this theory that has yet to be explored in detail. In fact, a recent study by Shelef, Levi-Belz, and Fruchter (2014) looked at dissociation and capability (AC) in Israeli soldiers. They hypothesized that both dissociation and AC were essential factors for creating a vulnerability to suicidal ideation and attempt behaviors (Shelef et al., 2014). When AC and dissociation interact with subjective stress

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and pain, it can create distancing and apathy of the body, that when combined with

habituation of pain and exposure to violence, can create greater tolerance for suicide

(Shelef et al., 2014).

<center>Virtual Reality</center>

All of these theories share a common goal of conceptualizing suicide risk;

however, they have mostly been tested using retrospective self-report measures, leading

to biases because of factors such as social desirability bias, mood-dependent recall, and

misremembering important details (Shelef et al., 2014). To address these concerns, recent

research has suggested using new technology such as virtual reality (VR) to elicit

dissociative symptoms and create realistic suicide scenarios (Petkova & Ehrsson, 2008;

Franklin et al., 2019).

Dissociation symptoms have been successfully created in a laboratory (Leonard,

Telch, & Harrington, 1999). Unfortunately, researchers have reported challenges in using

these procedures, such as difficulty or ineffectiveness in evoking depersonalization and

derealization episodes or weak levels of these sensations (Capron, Norr, Albanese, &

Schmidt, 2017). Researchers have found that using perceptual illusions with Head

Mounted Display (HMD) connected to an external camera showing participant live feed

can elicit dissociation symptoms through out-of-body experiences (Petkova & Ehrsson,

2008).

Capron and colleagues (2017) also explored additional tasks using an external

camera attached to an HMD device (Oculus) that exhibited increased dissociative

symptoms. One of the tasks they used was called opposite directions, which created

sensations of cognitive dyscontrol by asking a participant to turn their head, while the

<center>6</center>

experimenter turned the tripod with the camera slowly in the opposite direction. Another tasked referred to as rotation involves creating an out-of-body experience through depersonalization by having the participants observe themselves live on the HMD slowly spin in a circle (Capron et al., 2017). Both tasks were successful in inducing dissociative symptoms in participants and will be used in this current study to induce dissociative symptoms in participants (Capron et al., 2017). Bauer and colleagues (2019) also demonstrated that fear related to these HMD challenges was significantly associated with higher suicidality scores.

VR technologies are potentially a new translational approach for studying suicide causes (Franklin et al., 2019). A recent study used a VR game called Richie's Plank Experience to recreate a suicidal situation, where participants ride up an elevator to see the doors open to a plank extending over a tall building (Franklin et al., 2019). Participants can then choose to step off the plank or ride the elevator back down the bottom floor. If they decided to step off the plank, they virtually fall to the ground below, and when they reach the ground, the screen fades to white, and the scenario ended for the participant. Results from Franklin and colleagues (2019) showed that participants rated this scenario as realistic and related to suicide. Using this technology can augment self-report measures to understand further whether dissociation is a facilitator of suicide risk.

Present Study

The current study utilized an HMD Oculus Rift, virtual reality experiences, and an external camera Ovrvision Pro to create a dissociative induction task (using the two dissociation tasks discussed above) and realistic suicide experience using the VR game Richie's Plank Experience. Participants were divided into two groups: an experimental

group who participated in a VR dissociation induction task and a control group who participated in a neutral VR experience (used in Franklin et al., 2019). Both groups then engaged in the VR game Richie's Plank Experience to examine whether those who participated in a dissociative task would be more likely to jump and die by suicide virtually. There are two main hypotheses for this study: (1) Those who rate higher dissociation scores at baseline on the Dissociative Experiences Scale-II (pre-DES-II) will report increased suicidal ideation and attempt behaviors on the Suicidal Ideation Scale (SIS), and increased capability for suicide on the Acquired Capability for Suicide Scale (ACSS). (2) Participants who report higher acute dissociation scores after engaging in a dissociative induction condition will be more likely to engage in a virtual suicide option (Richie's Plank Experience). This second hypothesis will utilize the Oculus Rift and Ovrvision Pro. Additionally, we added an exploratory hypothesis that there would be a significant indirect effect of dissociation in relation to trauma and suicide risk (Note: this analysis will use a subgroup of participants who confirm they have experienced Criterion A based on the PCL-5).

The primary goal of this study was to examine whether dissociation is a facilitator of suicide by using recent technology, in particular, the Oculus Rift (2016) and external camera Ovrvision Pro. This study design aligns with the National Institute of Mental Health's (NIMH) Research Domain Criteria (RDoC) initiative by utilizing multiple units of analysis (i.e., self-report, behavioral) to investigate factors related to suicide attempt behaviors. Crucially, these results may provide important information on if dissociation acts as a facilitator of suicide risk that may impact attempt behaviors. Results may also further determine if virtual reality can aid in understanding suicidal individuals.

CHAPTER II - METHODOLOGY

Participants

Participants (N = 145) were undergraduate students recruited through the psychology department participant pool (SONA) at the University of Southern Mississippi. All participants were 18 years old or older and were compensated with 4.5 SONA credits for the one and half-hours. Participants were primarily 20 years old (SD 4.67), female (78.2%), white (59.9%), heterosexual (79.6%), and Christian (71.4%). Further demographic information can be found in Table 1.

Table 1
Demographic information

Sample Size	145
Age	
Mean (SD)	20.09 (4.67)
Sex	
Female (Male)	79.9% (20.1%)
Race	
White	59.9%
African American	36.7%
Hispanic/Latino	4.1%
Asian/Pacific Islander	2.7%
Other	2.7%

Table 1 Continued

Sexual Orientation	
Heterosexual	81.3%
Homosexual	4.2%
Bisexual	11.1%
Other	3.5%
Religious Beliefs	
Christian	72.4%
Atheist	6.9%
Other	8.3%
No Preference	12.4%
Virtually Jumped?	
Jumped	15.2%
Did not Jump	84.8%
Afraid of Heights?	
Yes	9.0%
No	91.0%

Participants were excluded from the virtual reality portion of this study if they showed evidence of a significant medical illness that would prevent the completion of perceptual illusion virtual reality exercises. Such conditions include visual impairment, cardiovascular disease, respiratory disorders, renal disease, epilepsy, stroke, and

uncontrolled hypertension or migraines. If a participant endorsed any of these past conditions on a checklist, they would still receive credits for their time. However, they would be excluded from the virtual reality scenarios in the study. Previously, this screening procedure was successful for other, similar studies conducted in our laboratory (Capron et al., 2017). Additional exclusionary criteria included: no evidence of severe suicidal intent that would indicate a need for hospitalization or immediate treatment, no evidence of current alcohol or substance abuse or dependence, no current or past psychotic-spectrum disorders, and no uncontrolled bipolar disorder. No participants had to be excluded from the study as a result of these criteria.

<div align="center">Materials</div>

Suicidal Ideation Scale (SIS; Rudd, 1989)

The SIS is a 10-item measure of past year presence of suicidal ideation and suicide attempts. Items are scored on a Likert scale of 1 (never) to 5 (always), with a total score ranging from 10-50 (Rudd, 1989). Rudd (1989) recommended scores of 15 or higher to be considered as *serious suicidal ideation*. The psychometric properties of the SIS have been well established (Rudd, 1989; Luxton, Rudd, Reger, & Gahm, 2011). The SIS total score will be used for this study to examine whether higher dissociation scores relate to higher suicidal ideation, as well as examine whether dissociation has an indirect effect on posttraumatic stress symptoms and suicidal ideation. The SIS demonstrated excellent internal consistency for this sample (α=.94).

Dissociative Experiences Scale-II (DES-II; Carlson & Putnam, 1993)

The DES-II is a 28-item self-report measure of lifetime frequency and intensity of dissociative experiences on a measure of 0-100%. The total is scored by adding the

numbers up a total, which is subsequently divided by 28 (the number of questions) to calculate the average score (Carlson & Putnam, 1993). Low levels of dissociation are indicated by a score of 30 or less, while higher levels are indicated by a score of more than 30 (Carlson & Putnam, 1993). The psychometric properties and reliability and validity of the DES-II have been well established in several studies (Carlson & Putnam, 1993; Dubester & Braun, 1995; van-IJzendoorn & Schuengel, 1996). The DES-II will be used for the purpose of this study to determine if increased dissociation will report increased suicidal ideation and capability for suicide. Post-DES-II scores will also be utilized to determine if higher scores are associated with individuals who virtually completed suicide in Richie's Plank Experience. Finally, the DES-II will be utilized to examine if dissociation has an indirect effect on posttraumatic stress symptoms and suicidal ideation. Baseline DES-II scores (α=.93) and post-DES-II scores (α=.94) demonstrated excellent internal consistency for this sample.

Posttraumatic Check List-5 with added Life Events Checklist and Criterion A (PCL-5; Weathers et al., 2013)

The PCL-5 measures posttraumatic stress symptoms on a scale ranging from 0 (not at all) to 4 (extremely). It measures overall PTSD symptoms and the four PTSD symptom clusters: intrusion, avoidance, hyperarousal, and negative alterations in cognition and mood. The psychometric properties for the PCL-5 have been well established (Weathers et al., 2013; Blevins, Weathers, Davis, Witte, & Domino, 2015). Individuals who have experienced a traumatic event will be established using the added Life Events Checklist and Criterion A (Weathers et al., 2013). The PCL-5 total score will be used to determine if there is a significant indirect effect of dissociation on

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posttraumatic stress symptoms and suicide risk. The PCL-5 demonstrated good internal consistency for this sample (α=.95).

Acquired Capability for Suicide Scale (ACSS; Van Orden et al., 2008)

The ACSS is a 20-item self-report measure of the extent to which individuals perceive themselves as capable of participating in potentially dangerous or fatal situations, including suicide. The psychometric properties for the ACSS have been well established (Van Orden et al., 2008). ACCS total score will be used for the purpose of this study to determine if dissociation is associated with capability for suicide. The ACSS demonstrated borderline internal consistency for this sample (α=.66).

Acute Dissociation Index (ADI: Leonard et al., 1999)

The ADI is a 26-item self-report measure that assesses acute dissociative thoughts and sensations (e.g., "things around me seem unreal") during laboratory dissociation challenges on an 11-point Likert scale (0-100; Leonard et al., 1999; Leonard et al., 2000). The ADI was designed with the factor structure of the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) and the Acute Panic Inventory (Harrison et al., 1989; Gorman et al., 1990). The questions address different types of dissociative sensations, including dissociative amnesia, depersonalization, derealization, absorption, and gaps in awareness. Unfortunately, the ADI has not been widely used in research, and psychometric data for the ADI is not yet available (Cox et al., 1999); however, this is the only self-report acute dissociation measure currently found in the literature, to my knowledge. The ADI demonstrated very good internal consistency for this sample (α=.91).

Virtual Reality Equipment

The Oculus Rift was released in 2016 and includes a headset, headphones that provide three-dimensional sound, controllers, and base stations that provide room-scale positional tracking. This system was run on a Dell Windows 10 with 32 GB RAM and an Intel Core i7 CPU. These specifications are all above the recommended specifications for the Oculus Rift. We will also utilize the Ovrvision Pro for this study, which is a high-performance external camera released in 2014 that is compatible with the Oculus system. The external camera is connected through the desktop, and then an app called "Ovrvision Pro" is launched through the Oculus gaming system.

Procedure

The participants provided informed consent and were given the primary investigator's contact information if they have any questions. The consent form emphasized that once they begin participation, they could discontinue participation at any time without penalty. Participants then completed a medical eligibility form to ensure they could complete the VR portion of this study.

Next, participants completed a battery of online tasks and questionnaires (listed above). In addition, participants were placed into either a VR dissociation induction task or VR control scenario. The dissociation induction tasks utilized have been previously shown to recreate depersonalization and derealization symptoms (Capron et al., 2017). After completing these tasks, the participants engaged in a VR game called Richie's Plank Experience, where participants can engage in a virtual suicide scenario by jumping off a plank. Results from Franklin and colleagues (2019) showed that participants rated this scenario as realistic and related to suicide. The perceptual illusions and virtual reality

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scenarios are described in detail below. The dissociation induction tasks were counterbalanced to ensure there are no order effects for these two tasks.

Challenge #1: Rotation (Capron et al., 2017)

This task is used to create sensations of depersonalization (i.e., out-of-body-experience). The experimenter positioned the camera (connected to the HMD) on the tripod 4 feet from the participant. The camera was positioned to capture the participant from the neck down, to see themselves spin from an "out of body" perspective. Participants were given the following instructions: "During this task, please spin very, very slowly in a circle. To prevent you from tripping over the headset's cord, I will tell you when to start turning in the opposite direction. Please continue until I tell you to stop. Please spin slowly enough that you do not become dizzy." Participants spun slowly for two minutes and were timed using a stopwatch. The goal of this task was to have the participant feel disconnected from their body by viewing themselves turning slowly in the "third-person."

Challenge #2: Opposite Directions (Capron et al., 2017)

This goal of this task was to create a sense of cognitive dyscontrol. The experimenter stood next to the participant with a camera (connected to the HMD) on a tripod (to provide smooth panning). The camera was positioned to mimic the participant's natural field of vision. Participants were told, "During this task, I will be instructing you to turn your head in the following directions: right, left, up and down. I will also say "center" which means look straight ahead. Move your head in a slow, fluid motion. I will count out loud to four, so try to make each motion last four seconds." As the participant turned their head, the experimenter turned the tripod with the camera slowly in the

opposite direction in a synchronous manner. The task was repeated for two minutes. The

goal was for the participant to feel a strong sense of derealization because they are

turning their head in one direction, but they are viewing themselves moving at equal

speed in the opposite direction.

Control scenario: Intro to VR (Franklin et al., 2019)

Intro to VR is a free app that cycles through several exciting scenes over

approximately three minutes (e.g., space, a group of elephants, Cirque du Soleil). These

scenes are primarily consistent with real-world videos. This scenario was used to ensure

the dissociative tasks induced acute dissociation compared to a control VR task.

Richie's Plank Experience (Franklin et al., 2019)

In this scenario, participants appeared on a virtual street in a city, entered an

elevator, went up a few hundred feet, and watched as elevator doors opened to a plank

extending out over a ledge. Participants were then given a choice whether or not to walk

out onto this plank and step off it or to ride the elevator back down to the ground floor.

The participant was told that if they stepped on the plank they were choosing to "commit

suicide" (note: commit was used here because it is more commonly understood by the

general population; Franklin et al., 2019). If they chose to step off the plank, participants

virtually fell to the ground below. When they reached the ground, the screen faded to

white, and the scenario ended for the participant. An actual 2x12 plank was utilized to

make the VR experience more immersive. A research assistant was always with the

participant to ensure safety. After completing these scenarios, participants completed a

set of post questionnaires before the conclusion of the study.

Safety Protocol

A safety protocol was implemented for participants if they scored high on suicidality (SIS score >15). If this happened, the principal investigator, Nicole Caulfield, was notified and conducted a suicide risk assessment before the participant left the lab. The risk assessment that was used was the Joiner et al. 1999 risk assessment. The risk assessment data were completely confidential and will be done in a private room. If the risk was determined to be moderate or above, a coping card would be administered, and Dr. Capron would be contacted to ensure all the necessary steps were taken to ensure the participant's safety. It was documented that a risk assessment was done, and the risk assessment was kept in their file in a locked storage unit, in a locked office, and shredded the at end of the study. In addition, the suicide hotline number was also provided for all participants.

<div align="center">Data Analytic Plan</div>

To analyze if dissociation is a predictor of suicide risk, a series of multiple regression analyses were conducted. All data initially were screened for outliers and missing data. Any data identified as an outlier with undue influence on the data were excluded from all analyses. Data were also screened prior to conducting analyses to confirm no violations of assumptions (e.g., normality, linearity, independence, homoscedasticity, multicollinearity). Covariates for the study were selected using methods where demographic variables significantly correlated with either independent or dependent variables will be included in the analyses. To test the first hypothesis that dissociation is a predictor of suicide risk, three separate regressions were analyzed. The first multiple regression had suicide risk (total SIS score) as a dependent variable and

dissociation (pre-DES-II) and demographic variables as independent variables. All independent variables will be entered into the model simultaneously. The second regression was a logistic regression with past suicide attempt (Y/N) as a dependent variable, and dissociation as the independent variable and demographic variables added as covariates. Finally, the third multiple regression had capability for suicide (ACCS) as the dependent variable and Dissociation (pre-DES-II) and demographic variables as independent variables. To test the second hypothesis, a logistic regression was utilized to examine if whether those who jumped vs. did not jump was predicted by acute dissociation score measured after they were induced into a dissociative state, with demographic variables included as covariates. For this hypothesis, only those who were in the experimental condition were included, and both the ADI and post-DES-II scores were used as measures of acute dissociation. Finally, to test our exploratory hypothesis, an indirect effects model was utilized using SPSS Process Macro (Hayes, 2013) to examine if dissociation (pre-DES-II) has an indirect effect on posttraumatic stress symptoms (PCL-5) and suicide risk (SIS). Only individuals who have experienced a traumatic event (endorsed by the LEC) were included in this last analysis.

Tests of Normality

Both DES-II scores and ADI scores significantly violated Kolmogorov-Smirnov and Shapiro-Wilk tests for normality. Further analyses determining skewness and kurtosis of variables indicated that DES-II scores were positively skewed and leptokurtic data data ranged from 10 to 93.21); however, ADI scores were negatively skewed (data ranged from 26 to 204). Data were log-transformed to better assess for normality.

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Power Analysis

Previous literature suggests that dissociation detects differences for trauma and suicide risk at a medium effect size (Lanius et al., 2012; Calati et al., 2017), and a large effect size for examining effects of dissociation induction challenges using VR (Capron et al., 2017). Additionally, Franklin and colleagues (2019) predicted that the VR suicide paradigm would have a small to moderate effect size. Since there is a discrepancy in the literature, a medium effect size was utilized to determine sample size. To determine sample size, a power analysis was conducted through GPower (Faul, Erdfelder, Buchner, & Lang, 2009). Gpower indicated that 85 participants would be needed to detect a medium effect size ($f^2 = .15$), α error probability at .05, and power at .80. Given that we were able to expand our sample size, a post hoc power analysis was conducted using a medium effect size, an α error probability at .05, and a sample size of 145. This analysis indicated that this sample yielded a power of .96.

CHAPTER III - RESULTS

Preliminary Analyses

Descriptive statistics and correlations among study variables are presented in Table 2. Correlations indicated that there was a significant relationship between suicidal ideation (indicated by total score on the SIS) and lifetime dissociation ($r=.29$, $p<.001$), acute dissociation ($r=.21$, $p< .05$), whether or not someone decided to engage in virtual suicide ($r=.21$, $p<.05$), and posttraumatic stress symptoms ($r=.54$, $p<.001$). There was no association between SIS scores and capability for suicide; however, most of the SIS questions focus on ideation, so this is to be expected. Surprisingly, the ADI was not associated with engaging in virtual suicide ($p = .191$). However, post-DES-II scores given immediately after the virtual reality experience was significantly associated with engaging in virtual suicide ($p = .029$).

Covariates used for these analyses were determined based on correlations of dependent and independent variables. For hypothesis 1, covariates include sex (female), sexual orientation (heterosexual), and religion (Christianity). For hypothesis 2, sexual orientation (heterosexual), as well as two correlated variables relevant to utilizing the dissociation induction task and VR game Richie's Plank Experience (simulation sickness questionnaire and UPPS impulsivity measure), were included in this analysis. Finally, for hypothesis 3, covariates again included sex (female), sexual orientation (heterosexual), and religion (Christianity).

A paired-samples t-test was conducted to ensure Richie's Plank Experience did not increase suicidality by examining baseline SIS and post-SIS scores. Results indicated that post-SIS scores were not significantly higher than basline SIS scores, in fact, pre-SIS

Table 2

Descriptive statistics and correlations in the primary analyses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	-	-.10	-.05	-.04	-.04	-.12	-.07	-.01	-.10	.05	-.15	-.03	-.05	.08	-.02	.03
2. Female	-.10	-	**.17***	-.11	-.14	**.10***	-.07	.01	-.01	.01	**.16***	.02	.09	-.13	**-.22****	-.10
3. White	-.05	**.17***	-	-.06	-.12	.10	.09	-.15	.08	-.02	.10	.02	.14	-.05	.03	.15
4. Heterosexual	-.04	-.11	-.06	-	**.54****	**-.33****	**-.26****	**-.19***	-.08	**-.20***	.00	**-.27****	-.08	.04	-.09	-.04
5. Christian	-.04	-.14	-.12	**.54****	-	**-.36****	**-.34****	-.03	-.02	-.10	-.13	**-.30****	-.13	.09	-.06	.09
6. SIS	-.12	.10	.10	**-.33****	**-.36****	-	**.70****	**.29****	**.20***	**.29****	**.21***	**.51****	**.24****	**-.32****	**.19***	.06
7. Attempt	-.07	-.07	.09	**-.26****	**-.34****	**.70****	-	**.29****	**.22****	**.33****	.10	**.41****	**.20***	**-.28****	**.18***	.12
8. DES-II Baseline	-.01	.01	-.15	**-.19***	-.03	**.29****	**.29****	-	**.37****	**.82****	.12	**.44****	.11	**-.33****	**.23****	-.09
9. ADI	-.10	-.01	.08	-.08	-.02	**.20***	**.22****	**.37****	-	**.44****	.09	**.45****	.12	**-.26****	**.56****	.02
10. DES-II Post	-.07	.06	.02	**-.22***	-.12	**.27****	**.27****	**.82****	**.45****	-	**.20***	**.49****	**.28****	**-.31****	**.37****	-.07
11. Jumped	-.15	**.16***	.10	.00	-.13	**.21***	.10	.12	.09	.15	-	**.18***	**.21***	-.15	**.17***	-.13
12. PCL-5	-.03	.02	.02	**-.27****	**-.30****	**.51****	**.41****	**.44****	**.45****	**.49****	**.18***	-	**.22****	**-.29****	**.31****	.07
13. ACSS	-.05	.09	.14	-.08	-.13	**.24****	**.20***	.11	.12	**.24****	**.21***	**.22****	-	**-.37****	.10	-.01
14. UPPS	.08	-.13	-.05	.04	.09	**-.32****	**-.28****	**-.33****	**-.26****	**-.31****	-.15	**-.29****	**-.37****	-	**-.27****	.06
15. SSQ	-.02	**-.22****	.03	-.09	-.06	**.19***	**.18***	**.23****	**.56****	**.35****	**.17***	**.31****	.10	**-.26****	-	.06
16. Afraid of Heights?	0.03	-.10	.15	-.04	.09	.06	.12	-.09	.02	-.06	-.13	.07	-.01	.06	.06	-
Mean	20.09	--	--	--	--	14.62	--	35.06	94.79	33.70	--	43.99	52.49	143.23	28.65	--
SD	4.67	--	--	--	--	6.60	--	15.80	41.15	16.61	--	19.24	7.15	19.17	8.99	--

Note: * = significant at the p < .05 level; ** = significant at the p < .01 level; SIS= Suicidal Ideation Scale; DES-II= Dissociative Experiences Scale; ADI= Acute Dissociative Inventory; PCL-5 = Posttraumatic Checklist-5; ACSS = Acquired Capability for Suicide Scale; UPPS= Impulsivity Score; SSQ = Simulation Sickness Questionnaire.

scores were significantly higher than post-SIS scores $t(140) = 4.85, p < .001$;

Mean(SD)$_{pre}$ = 14.56(6.59); Mean(SD)$_{post}$= 13.44(5.82). Finally, a t-test was conducted to

examine if those who went through the dissociation induction condition had higher acute

dissociation scores than those who went through the control condition. Results indicated

that those who went through the dissociation induction tasks had a significantly higher

mean than those who went through the control condition $t(143) = 2.69, p = .001$.

<div align="center">Primary Analyses</div>

Dissociation Predicting Current Suicidal Ideation, Attempt, and Capability for Suicide

The first multiple regression analysis examined the association between suicidal

ideation (SIS total score), lifetime dissociative experiences (pre-DES-II total score), and

correlated demographic variables (sex, sexual orientation, and religion). This model

accounted for 22.3% of the variance for suicidal ideation ($F (4, 143) = 9.98, p <$

$.001$). Results indicate that lifetime dissociative experiences ($\beta = .26, t = 3.41, p = .001$)

were significantly associated with suicidal ideation. Results can be found in Table 3.

Table 3
Multiple regression analyses examining the association between past-year suicidal ideation and lifetime dissociation

Predictor	Suicidal Ideation (SIS total score)			
	R^2	B	p	F
DES-II Baseline		**.261**	**.001**	
Female		.048	.523	
Heterosexual		-.127	.163	
Christian		**-.277**	**.002**	
	.223			**9.98**

Note: Significant associations are bolded for clarity; DES-II = Dissociative Experiences Scale-II

A binary logistic regression was also run to examine the association between prior suicide attempt(s) and lifetime dissociative experiences (pre-DES-II total score). The proposed model was significant χ^2 (4, N=143) = 28.79, p < .001. The prediction of this model was correct 81.3% of the time. Results indicated that those with increased lifetime dissociative experiences were significantly more likely to have experienced a prior suicide attempt(s) (OR = 1.05, $\chi2$ (1) = 10.30, p = .001, *95% CI* 1.019, 1.080). Results can be found in Table 4.

Table 4
Binary logistic regression analyses examining the association between past suicide attempt and lifetime dissociation

	Past suicide attempt(s)			
Predictor	$X^2(1)$	*OR*	*p*	*95% CI*
DES-II Baseline	**10.30**	**1.05**	**.001**	**1.019, 1.080**
Female	1.60	.472	.206	.148, 1.512
Heterosexual	.014	.929	.906	.274, 3.148
Christian	**10.86**	**.152**	**.001**	**.050, .466**

Nagelkerke R^2 .286
Note: Significant associations are bolded for clarity; DES-II = Dissociative Experiences Scale-II

The second multiple regression examined the association between capability for suicide (ACSS total score), lifetime dissociative experiences (pre-DES-II total score), and correlated demographic variables (sex, sexual orientation, and religion). This model accounted for 10.5% of the variance for capability for suicide in this sample of undergraduates (F (4, 143) = 4.10, p =.004). Results indicate that lifetime dissociative

experiences (β = .23, t = 2.83, p = .005) were significantly associated with capability for

suicide. Results can be found in Table 5.

Table 5
Multiple regression analyses examining the association between capability for suicide and lifetime dissociation

	Capability for suicide (ACSS)			
	R^2	B	p	F
Predictor				
DES-II Baseline		**.232**	**.005**	
Female		**.192**	**.019**	
Heterosexual		-.066	.497	
Christian		-.005	.955	
	.105			**4.10**

Note: Significant associations are bolded for clarity; DES-II = Dissociative Experiences Scale-II

Acute Dissociation Predicting Engaging in Virtual Suicide

To assess the second hypothesis, the author used a logistic regression to examine

the association between choosing a virtual suicide option (jumping off a virtual plank),

acute dissociation (ADI), and correlated demographic variables. These demographic

variables included variables related to using virtual reality, including the simulation

sickness questionnaire (SSQ) and an impulsivity measure (UPPS). Importantly, only

students included in the dissociation induction condition were included in these analyses

(n = 117). This model was not significant and indicated the acute dissociation was not

related to choosing the virtual suicide option (χ^2 (8, N=117) = 4.35, p = .824). Results can

be found in Table 6.

Table 6

Binary logistic regression analyses examining the association between acute dissociation scores (ADI) and choosing to complete virtual suicide option

	Choosing virtual suicide option (Y/N)			
Predictor	$X^2(1)$	*OR*	*p*	*95% CI*
ADI	.016	1.23	.898	.054, 27.99
Heterosexual	.244	1.41	.621	.360 , 5.54
UPPS	1.18	.985	.278	.958 , 1.01
SSQ	2.05	1.05	.152	.983 , 1.13

Nagelkerke R^2 .086

Note: Significant associations are bolded for clarity; ADI = Acute Dissociation Inventory

Acute Post-DES-II Scores Predicting Engaging in Virtual Suicide

An additional binary logistic regression to assess whether post-DES-II scores measured immediately after engaging in these VR paradigms were associated with engaging in virtual suicide, with correlated demographic variables added as covariates. This model was significant (χ^2 (5, *N*=117) = 11.62, *p* = .040); however, dissociation scores (DES-II) were not significantly related to choosing the virtual suicide option (*OR* = 1.02, χ^2 (1) = 1.73, *p* = .189, *95% CI* .989, 1.056; See Table 7).

Table 7

Binary logistic regression analyses examining the association between post dissociation scores (DES-II) and choosing to complete virtual suicide option

|	Choosing virtual suicide option (Y/N)			
Predictor	$X^2(1)$	*OR*	*p*	*95% CI*
Post DES-II	2.30	1.03	.130	.993, 1.06
Heterosexual	.648	1.81	.421	.427 , 7.67
UPPS	.643	.989	.423	.961 , 1.02
SSQ	1.76	1.04	.184	.982 , 1.10

Nagelkerke R^2 .117

Note: Significant associations are bolded for clarity; DES-II = Dissociative Experiences Scale-II

Exploratory Analysis

Examining the Indirect Effect of Dissociation on PTSD and Suicide Risk

For this analysis, only people who experienced a traumatic event (*n* = 124) were included in this analysis. Results indicated that posttraumatic stress symptoms had a significant direct effect on suicidal ideation (β=14.87, *SE*=3.36, *p* <.001, *95% CI* =8.22, 21.52). The association between posttraumatic stress symptoms and dissociation was also significant (β=.50, *SE*=.08, *p* <.001, 95% CI =.336, .670). In this model, disssociation was not signifiacntly associated with suicidal ideation (β=2.30, *SE*=3.21, *p* =.476, *95% CI* =-4.05, 8.64). Additionally, there was not a significant indirect effect on posttraumatic stress symptoms and suicidal thoughts via dissociation (β=1.15, *SE*=1.70, *95% CI* = -2.37, 4.37). Results can be found in Figure 1.
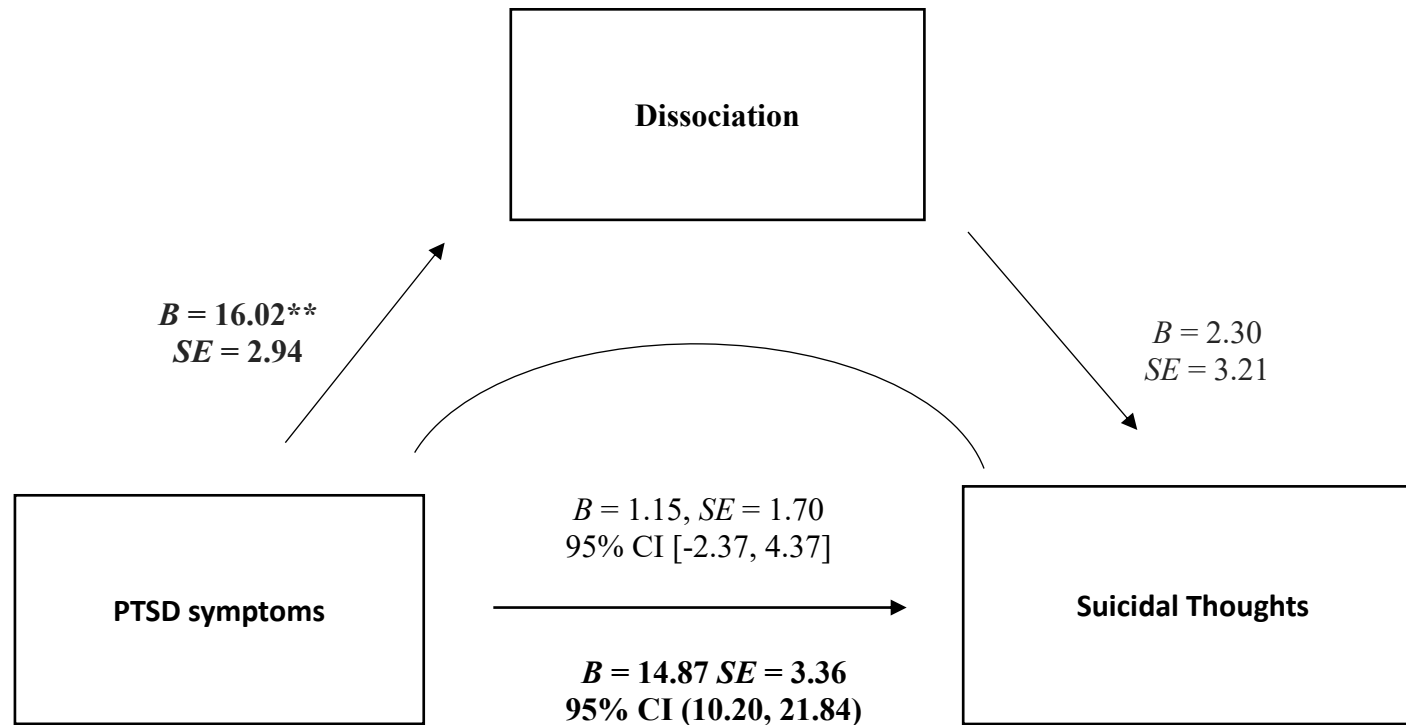
Note: Covariates for this model included gender and sexual orientation, and religion; Indirect effect reported within [] and direct effect reported in (). Significant effects are bolded for clarity.

Figure 1. *PTSD and Suicidal Thoughts via Dissociation*

CHAPTER IV – DISCUSSION

Despite an increase in research on suicide, little is known about what facilitates the transition from suicidal ideation to suicide attempt (Franklin et al.; 2017; Klonsky & May, 2015; May & Klonsky, 2016; Nock et al., 2008). Literature on facilitators of suicide risk has been limited because of the unique ethical considerations and inability to study suicide in a laboratory. The goal of this current study was to examine whether dissociation was a facilitator of suicide risk. There were two main hypotheses for this study: (1) Those who rate higher dissociation scores at baseline on the Dissociative Experiences Scale-II (pre-DES-II) would report increased suicidal ideation and attempt behaviors on the Suicidal Ideation Scale (SIS), and increased capability for suicide on the Acquired Capability for Suicide Scale (ACSS), and (2) Participants who reported higher acute dissociation scores after engaging in a dissociative induction condition would be more likely to engage in a virtual suicide option (Richie's Plank Experience). Additionally, there was an exploratory hypothesis that there would be a significant indirect effect of dissociation in relation to trauma and suicide risk.

In line with our first hypothesis, lifetime dissociation was significantly positively associated with past year presence of suicidal ideation, past suicide attempt, and capability for suicide. This further corroborates the idea that dissociation is a significant correlate of suicide risk. Prior literature has shown robust associations between suicide risk and dissociation (e.g., Calati et al., 2017; Foote et al., 2008; Robasco & Andover, 2019); however, literature examining capability for suicide and dissociation have been mixed, with some results showing positive associations (e.g., Giolas and Sanders, 1992; Ludascher et al., 2007), while others show no associations (e.g., Bunderla and

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Kumperscak, 2015). According to the IPT, capability for suicide is composed of two components, fearlessness about death and increased tolerance to bodily pain (Joiner, 2005; Smith & Cukrowicz 2010), and perhaps these conflicting findings are a result of dissociation being more highly related to pain tolerance than fearlessness about death. Suicide is a violent act on the body and being able to inflict physical pain is an integral factor in attempting suicide (Rabasco & Andover, 2019). These results would align with Orbach's (1994) hypothesis that increased dissociation leads to an indifference to pain and a disconnect from the body, which would render a suicidal act as more probable. A recent study by Rabasco and Andover (2019) showed that higher dissociation scores increased the prediction of past suicide attempts on a model examining pain tolerance and suicidal ideation. Dissociation may be an integral factor in this facilitation from suicidal ideation to suicide attempt by increasing one's tolerance to pain, disconnect from the body, and the ability to cause bodily harm.

For our second hypothesis, we hypothesized that choosing the virtual suicide option would be associated with acute dissociation scores from the ADI. This was not the case. This result has several possible explanations. One, The ADI has not been widely used, and the psychometric properties are not well established. This was a limitation; however, currently, it is the only scale developed to measure acute dissociation, to our knowledge. As a result of the psychometric properties not being well established, we also measured acute dissociation by immediately giving a post-DES-II after engaging in the VR portion of the study. We did find that post-DES-II scores were significantly correlated with choosing the virtual suicide scenario (p = .029); however, it was not

significantly associated with engaging in virtual suicide after other correlated factors were added (e.g., motion sickness, impulsivity).

These null results may also be a result of the virtual task used to measure suicide risk. Richie's Plank Experience has previously been shown to be positively associated with suicidal ideation and attempt (Franklin et al., 2019). However, in this sample, while choosing virtual suicide was related to suicidal ideation ($p = .024$), the decision to jump was not significantly correlated to past suicide attempt ($p = .359$). This may help explain these findings, given that dissociation may be a facilitator of suicide that is more relevant in the progression from ideation to attempt. When considering methods of suicide for both males and females, only 2.4% of people used falling as a means for suicide, and the most common methods for suicide in ages 15-24 are firearms, poisoning, and suffocation (Center for Disease Control, 2020). It is difficult to create suicide-specific paradigms in a laboratory, and it important to examine what works and does not work using VR. Richie's Plank Experience may be relevant in examining suicidal ideation, but other virtual paradigms should be examined that may be more relevant in examining suicide attempt (e.g., a paradigm where you would choose to use a firearm or poison).

Another possible factor to consider is that dissociation is multifaceted, consisting of two main components (compartmentalization and detachment; Rossi et al., 2019). Prior factor analyses of the DES-II showed three main subfactors (dissociative amnesia, absorption and consumption, and depersonalization and derealization; Carlson & Putnam, 1993). It is possible that one or more of these subfactors may be more relevant to suicide risk than others. As it relates to suicide, it seems that the depersonalization and derealization subfactor of dissociation relates most closely to the theories of dissociation

and suicide discussed above (e.g., Baumeister, 1990; Orbach, 1994). Additionally, the dissociative subtype of PTSD only accounts for depersonalization and derealization, and this subtype has consistently shown to have higher suicide risk than non-dissociative PTSD (Lanius et al., 2010; Nemeroff et al., 2013). Current research classifies depersonalization and derealization as detachment symptoms (Rossi et al., 2019). Symptoms of detachment can cause an out-of-body experience, a sense of separation from the body, and a numbing of everyday life (Rossi et al., 2019). Of note, the dissociation induction tasks used in this study only induced depersonalization and derealization symptoms. Our self-report acute measures of dissociation included multiple facets of dissociation above and beyond depersonalization and derealization, which may partially account for the non-significance of these findings.

To examine this follow-up hypothesis, the author examined the three DES-II subscales suggested by Carlson and Putnam (1993), and the depersonalization and derealization subfactor of the DES-II was significantly associated with choosing the virtual suicide option, even when significant correlates were added (χ^2 (5, N=119) = 10.46, p = .033; derealization and depersonalization: OR = 1.05, $\chi2$ (1) = 4.31, p = .038, 95% CI: 1.00, 1.11). While it is possible acute dissociation may not be as relevant for suicide risk, it is also possible that a creating an acute dissociation measure focusing solely on depersonalization and derealization may be more relevant for examining dissociation as a facilitator of suicide risk.

Finally, we explored whether dissociation had an indirect effect on posttraumatic stress symptoms and suicide risk. For this sample, we only included those who had endured a traumatic event (n = 124). Our results showed that dissociation did not have a

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significant indirect effect on this model. A prior systematic review showed evidence that dissociation was a mediator between trauma and non-suicidal self-injury; however, this had not been assessed examining suicidal thoughts and behaviors (Rossi et al., 2019). It would seem probable that based on the theory of dissociation being an escape mechanism to trauma, dissociation might help explain why those with PTSD may be more likely to develop suicide risk. Many symptoms relevant to PTSD are based on dissociation, such as intrusive memories and flashbacks (Rossi et al., 2019). However, it may be that dissociation may be more of a moderator for suicide risk instead of a mediator, and the presence of dissociation and posttraumatic stress symptoms may increase someone's risk for suicide. Given our small sample size and the fact PTSD was not clinically diagnosed in this sample, it is difficult to know the true meaning of this relationship. Future research should explore this in larger samples of patients with PTSD, particularly those who also have the dissociative subtype of PTSD.

<center>Limitations and Strengths</center>

It is important to note the limitations of this study. This was a sample of undergraduate students participating in this study for course credit, which could have led to a biased sample and limited generalizability of results. Also, as noted in Franklin and colleagues (2019), engaging in VR suicide is not the same as engaging in actual suicide or suicidal behaviors. VR is a way to try to recreate certain sensations and situations one might experience when engaging in a suicide attempt; however, it is an imperfect measure of suicide risk. Another limitation is that one of our acute dissociation measures, the ADI, is not a well-established and widely used measure of acute dissociation. This could have influenced the results of our study. Finally, the VR game we used, Richie's

Plank Experience, used an uncommon method of suicide (jumping/falling off a building). Future studies should examine different, more common methods of suicide using VR.

Despite these limitations, the study had a number of strengths. Our sample was diverse in terms of race and sexual orientation (approximately 40% non-white; 20% LGBTQ). Our sample also included a high base rate of present suicidal ideation (34%) for a college sample (Mortier et al., 2018). This was also a multi-method analysis of suicide risk examining several gaps in the literature. This was the first study to examine lifetime and acute dissociation as a facilitator of suicide risk using both self-report and VR and aligned with NIMH's RDoC initiative by utilizing multiple units of analysis. This was also the first study to examine the indirect effects of dissociation on posttraumatic stress symptoms and suicide risk. Furthermore, utilizing VR in suicide research, while imperfect, can further help us understand suicide risk and help fill a major gap in the literature as a result of suicide relying heavily on self-report methodology.

Future Directions and Conclusion

Results showed that dissociation should be considered a relevant factor in the assessment of suicide risk and may potentially be a facilitator for the transition of suicidal ideation to suicide attempt. This was further corroborated by examining the association between dissociation and capability for suicide risk. This current study replicated prior studies showing dissociation was associated with current suicidal ideation, prior attempts, and capability for suicide. We also showed that certain parts of dissociation (e.g., depersonalization and derealization) might be the most relevant facets of dissociation related to choosing virtual suicide. We also were able to highlight the difficulty of studying suicide risk while also attempting to use novel ways to examine suicide risk and

potential facilitators using VR. Suicide is a complicated phenomenon that is very difficult to assess given ethical and practical considerations. VR suicide scenarios such as Richie's Plank Experience, while shown to be realistic and related to suicide, are not the same as an actual attempt or dying by suicide. Importantly, our results showed that this paradigm did not increase suicide intent as a result of participating in this study. While imperfect, as shown from our results, VR suicide scenarios can still provide important information on suicidal behaviors and should be used in conjunction with self-report and other behavioral tasks.

Future research should continue to use updated VR systems to increase visual and tactile realism and use other VR games that utilize more common methods of suicide risk (e.g., using a firearm). Additionally, research should also look at creating a more nuanced measure of acute dissociation, focusing on depersonalization and derealization. Future research should also continue to examine these relationships longitudinally and in more clinical and diverse populations using VR.

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NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-18-213
PROJECT TITLE: Exploring the Relationship between Suicide and Dissociation through Virtual Reality
SCHOOL/PROGRAM: School of Psychology, Psychology
RESEARCHER(S): Nicole Caulfield, Daniel Capron

IRB COMMITTEE ACTION: Approved
7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: September 6, 2019 to June 18, 2020

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

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