

An analysis of short-term memory and Dissociative Identity Disorder

By JEREMY M. KANG

COLORADO STATE UNIVERSITY

Introduction:

Background

According to the DSM-IV, Dissociative Identity Disorder (DID) is defined as two or more different identities in a single person that control behavior and involve "frequent gaps in memory."¹ Inter-identity amnesia is described as "one identity being amnesic for events experienced by other identities."²⁻⁷ Dissociative Identity Disorder has been the target of controversy, much of it dismissing the ability to have multiple distinct identities and complete amnesic experiences.^{1,8} Previous research has come short of revealing coherent evidence that supports or disproves the existence of DID.⁷ However, with DID being a fairly difficult disorder to study because of the difficulty and rarity of finding legitimate, diagnosed participants, research on DID continues to be a popular subject of debate. Recent research has focused on testing memory capability and various experimental designs have been used. These studies have included a group of participants who are told to simulate DID.⁷⁻¹⁰ Also in these studies, both DID patients and simulating groups were tested for their implicit and explicit memory in two different personalities. Results of these studies suggested that DID is a reaction to a traumatic experience, and DID participants are not completely amnesic to inter-identity experiences.^{3,7-10}

Previous literature

An inevitable weakness of research on DID is the limited number of participants diagnosed with DID. This is due, in part, to the rarity of the disorder and its questionable legitimacy as a disorder. Past studies found it difficult to include a multitude of DID participants as some had as few as four to 22 DID participants. However, the simulating control group (participants mimicking DID) has proven to be an essential aspect of many of the studies on DID.⁷⁻¹⁰ While there is not much that can be done regarding the number of DID participants in the study, a vast amount of non-DID (simulators) can be included to increase the validity of the experiment.

Another concern for studies on DID is priming among participants. In other words, there is a possibility that the participants are

making associations with words, pictures, and to some extent, numbers, with previous knowledge of that item when given stimuli. Schacter (1987) defines priming as "facilitation in the processing of a stimulus as a function of a recent encounter with the same stimulus."¹¹ Although Huntjens et al. (2007) focused on measuring emotional associations with their words/pictures and gathered important data regarding the link between DID and trauma, the proposed study will examine the relationship between short-term memory and DID with the hope of decreasing the chance that associations will be made by the participants when given the numbers.⁹ This will be done in the proposed study by presenting different computer-generated randomized numbers given to both personality #1 and personality #2 of the same individual. Previous studies that used word and/or picture recall, with the exception of Huntjens et al.'s study (2007), failed to address the associations that may have occurred among their participants.⁹ However, in Huntjens et al.'s (2007) study, three participants were found to have learned the material presented to them when they switched to the second personality.⁹ One participant reported to have knowledge of one word, another participant "reported knowledge of two words," and the third claimed knowledge of the procedure but not the material presented.⁹ Whether or not there is a significant difference in an associated word/number or a neutral word/number, this study will attempt to avoid association by using just numbers instead of words or pictures in order to raise external validity. This decision is based on the assumption that there are fewer associations to numbers compared to those of words in human cognition. Further research should examine word, picture, and number associations and how they may affect DID participants in memory tests.

The highly cited study by Miller (1994) explains that short-term memory can retain about 7 +/- 2 objects.¹² However, a study by Logan (1988) concluded that consistent mapping (material that is learned is held constant [e.g., $A + 2 = C$]) leads to faster recall as opposed to inconsistent mapping (material that can vary [e.g., $A + 2 = C$, but also $= D, P, Z$]).¹³ This can be explained because the participants were using previous recall strategies to remember that $A = 1, B = 2$, etc. Indeed,

practice in a task that is consistent will lead to better performance. It is expected then, when individuals are given increasing numbers of objects to recall, they will retain increasing amounts of objects because they learn how to memorize more as they are repeatedly (and consistently) tested for their ability to recall the objects. As mentioned, previous studies used words and/or visual cues as the objects presented to test their participants on their memory. Implicit and explicit memories of the participants were subsequently measured through memory tasks, word pair, and word-stem completion tasks.^{3,9,10} However, the use of numbers has not been previously used in experiments for DID. It is crucial that all methods be used to test DID in order to understand better the basis of the disorder. By using numbers instead of words/pictures, evidence to support previous research findings can solidify the empirical characterization of DID.

Past studies have revealed significant findings by using different types of control groups. These studies consisted of "normal" groups (groups that are considered mentally stable) that were pre-examined to meet the criteria of their experiments.^{7,8,10} Huntjens et al. (2006) even included a guessor group (described as an amnesic group that was not given the stimulus material) and concluded that the DID participants scored significantly higher ($p = .01$) compared to the simulating group but not differing significantly with guessor group ($p = .10$).⁷ Considering this finding, further studies should include a guessor group to extend on Huntjens et al.'s (2006) study and to provide further evidence of priming.⁷ However, this proposed study will include DID participants between two groups and a simulating group to gather data.

Some of the criteria used in Eich et al.'s (1997), Huntjens et al.'s (2006, 2007), and Kong et al.'s (2008) studies for inclusion of DID patients that should be noted are: a diagnosis from a licensed clinician, the ability to switch from one identity to another without interference, and the other identities are amnesic of events that occurred for the present identity.^{3,7-9} By using these criteria, their studies ensured that DID participants were legitimate and capable of participating in the study. This screening process is crucial as Kong et al. (2008) found one potential DID interviewee

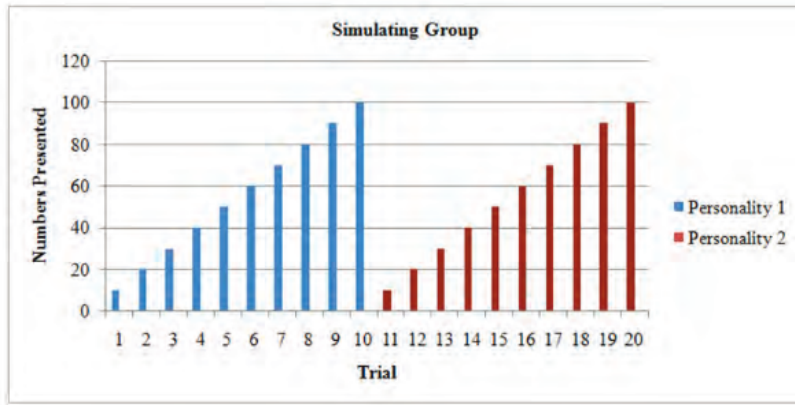


Figure 1. The simulating group will undergo the same procedure as the DID participant group.

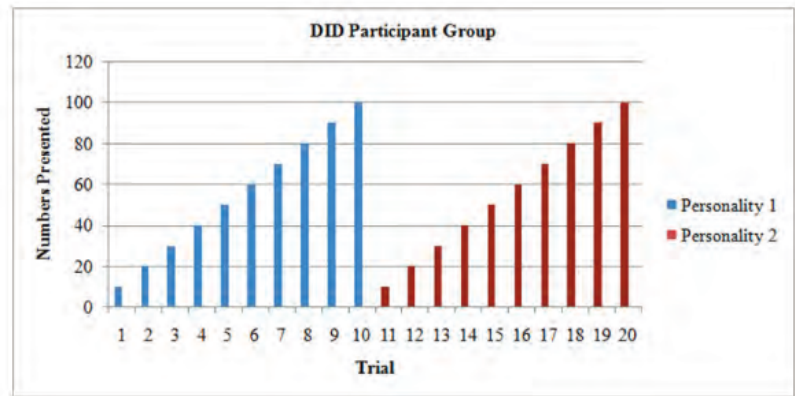


Figure 2. The DID participant group will use two personalities during the 20 trials.

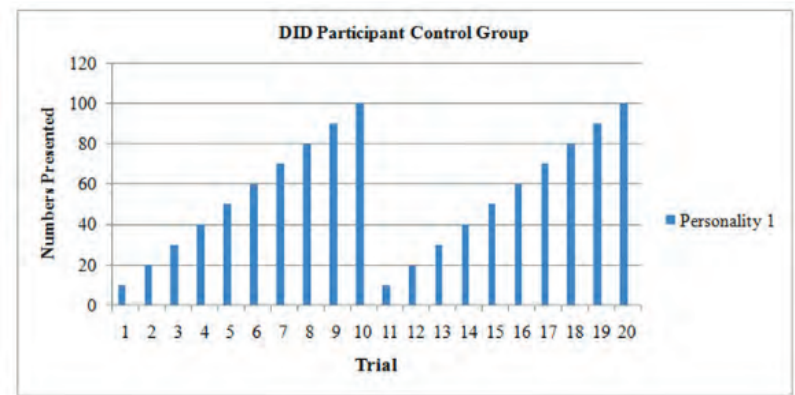


Figure 3. The DID participant control group will not switch personalities during the 20 trials.

that “did not meet the DID criteria.”⁸ For this proposed study, the non-DID participants will also undergo a similar examination of their history, mental health, and be tested on their ability to follow directions for the study to ensure internal validity.

Method:

Structure

By taking some of the procedures and methods used by Huntjens et al. (2006, 2007), we will use both a simulating group and DID participants to contribute to a more thorough understanding of DID.^{7,9} The criteria for DID legitimacy from Eich et al.’s (1997), Huntjens et al.’s (2006, 2007), and Kong et al.’s (2008)

studies will be reexamined and adopted for this proposed study.^{3,7-9} However, there will be several logistical differences in this proposed study. Using numbers as opposed to words is a key difference in this study. Ten trials, with the addition of ten new numbers for each trial, will be assessed for both personality #1 and personality #2 of the simulating and DID participant groups, accounting for 20 trials total (see Figure 1 & 2). After each trial, the participants will be given a recall test. This will continue until 10 trials are completed, and then the individual will be asked to change to personality #2. The DID participant control group will be assessed 20 trials for a single personality (see Figure 3). The in-

dependent variable will be whether or not the participant will have had previous exposure to the numbers. Through this method, it is hypothesized that personality #2 of the DID participant group will retain an increased amount of numbers when compared to personality #1, similar to the DID participant control group. This would imply that priming is active in DID patients that changed personalities (i.e. DID participant group) and provides evidence that personality #2 had prior knowledge of the tests (i.e. consistent mapping) instead of being completely amnesic and also doesn’t follow Miller’s Law of short-term memory of retaining 7 +/- 2 objects.^{12,13}

Participants

There will be three different groups associated with the study. The DID participant group will be carefully evaluated in order to meet the criteria for the study. A DID participant control group will be assessed and will be used to compare data to the DID participant group. A simulating group consisting of psychologically evaluated persons will also be included in the study. This group will mimic DID symptoms by creating two personalities to participate in the trials. All of these participants will be matched as close as possible by their age, education, gender, and socioeconomic status to their DID participant group or DID participant control group counterpart.

DID participants will be recruited via nationwide mailings, ads, and by contacting psychiatric and counseling centers until 50 individuals are screened and determined to be adequate for the study. We will seek DID participants throughout the United States because, compared to Europe, the United States has been found to have higher diagnosed rates of DID.¹⁴ Once these individuals are verified to participate in the study, they will be randomly assigned either to the DID participant group or to the DID participant control group. Licensed and accredited clinicians will screen the DID patients for legitimacy, psychological history, current mental health, and ability to participate in an experimental study with limited psychological repercussions. Additionally, the clinicians will screen for two conditions for the study. First and foremost, it is essential that the DID patients are able to switch between personalities while the other identities are not conscious of the events for the present identity. Second, the personalities must not interfere with the present identity during the trials. These two conditions are crucial in order to distinguish the personalities while the trials are in session.

Fifty mentally healthy individuals will be recruited from the United States for the sim-

ulating group. Individuals without previous knowledge of DID will be the most prevalent for this group. The simulating group will be similarly psychologically evaluated. The licensed and accredited clinicians will look at individuals' mental health and history. They will be matched to DID participants with similar age, education, gender, and socioeconomic status. The simulating group will be given information (i.e. description, history, and video of a person with DID) about DID and will be asked if they believe they are capable of mimicking the disorder. The 50 individuals are then matched with their DID participant counterparts and confirmed competent to mimic the symptoms through a psychometric test (short test of DID facts) created by our research team, and resulting data will be compared to the DID participant group.

Procedure

This proposed study will use a between-subjects single-factor randomized two-group design. The 50 DID participants will be randomly assigned either to the DID participant group (changes personalities) or to the DID participant control group (does not change personalities). They will go through 10 trials with a recall at the end of each trial for personality #1. This process will be repeated for personality #2. The DID participant control group will undergo 20 trials without changing personalities. The simulating group will also go through the same procedure as the DID participant group.

The 50 DID participants will be provided a summary of the study, excluding information on priming during personality #2 and Miller's Law of short-term memory. This is done to avoid the possibility that participants become conscious about their memory capabilities and alter their performance during the study. For the DID participant and simulating group, 10 trials and one recall trial will be given to personality #1 and will also be assessed to personality #2. Personality #1, as well as personality #2, will be exposed to 450 different randomized (i.e. consistent mapping) three-digit numbers generated by a computer over the ten trials. The first trial will consist of 10 three-digit randomized numbers. The second trial will consist of 20 different randomized three-digit numbers. The third trial will consist of 30 different randomized three-digit numbers and so on until 10 trials are completed (see Figures 1 & 2). The DID participant control group will continue until 20 trials are completed (see Figure 3). They will be given 10 minutes to study the numbers and then 5 minutes to recall as many numbers as they can. After the fifth,

tenth, and fifteenth trial, the participants will receive a 5 minute break to avoid fatigue. Following Miller's Law of short-term memory, it is expected that these participants will recall approximately 7 ± 2 numbers for the first trial and increasing amounts in subsequent trials (i.e. for the second trial, the personality will recall more than the first trial).¹¹

After personality #1 completes the first 10 trials, the participants (DID participant group and simulating group) will be asked to switch to personality #2 for the first trial that this identity will encounter. They will be given whatever amount of time they need to switch personalities and an additional 5 minute break. When personality #2 is ready, they will repeat the exact process that personality #1 was tested on. The numbers presented to personality #2 will be completely different from the 450 numbers presented to personality #1. This will be done to avoid any carry-over of possible learned numbers transferred between personalities and any associations previously made. If complete inter-identity amnesia actually occurs between the personalities of the individuals, personality #2 will begin the first trial with recalling only 7 ± 2 numbers instead of the increased amount of numbers as hypothesized in this study.

Previous exposure to numbers will be manipulated between participants, and it will be considered the independent variable of the study. The dependent variable will be the amount of numbers recalled for personality #1 and personality #2. If personality #2 of the DID participant group exhibits a superior short-term memory than does personality #1 in the first trial (i.e. first trial for personality #1, first trial for personality #2) and statistical significance is found to be true ($p \leq .05$) using an ANOVA test, it suggests that the DID participant group is no different than either the DID control group or the simulating group. Personality #2 of the simulating group and DID participant group is hypothesized to retain more than the numbers in the first trial to provide evidence of increased ability to recall numbers. The results of the simulating group will be compared to that of the DID participant group to see if there is any similarity.

After all of the data from the three groups are collected, the participants will be given a debriefing form; again, explaining the study, the purpose of the experiment, priming, and human memory. This study hopes to find results similar to those of previous studies, suggesting that complete inter-identity amnesia is a false phenomenon, and to provide supplementary evidence to the current DID literature.

References

- ¹American Psychiatric Association. (2000) *Diagnostic and Statistical Manual of Mental Disorders 4*. American Psychiatric Association. Pg 526.
- ²Silberman, E. (1985) "Dissociative states in multiple personality disorder: A quantitative study." *Psychiatry Research* 15.4. Pg 253-260.
- ³Eich, E., Macaulay, D., Loewenstein, R. and Dible, P. (1997) "Memory, amnesia, and dissociative identity disorder." *Psychological Science* 8.6. Pg 417-422.
- ⁴Allen, J. B. and Movius, H. L. (2000) "The objective assessment of amnesia in dissociative identity disorder using event-related potentials." *International Journal of Psychophysiology* 38. Pg 21-41.
- ⁵Huntjens, R. J. C., Postma, A., Hamaker, E. L., Woertman, L., Van der Hart, O. and Peters, M. L. (2002) "Perceptual and conceptual priming in patients with dissociative identity disorder." *Memory & Cognition* 30. Pg 1033-1043.
- ⁶Huntjens, R. J. C., Postma, A., Peters, M., Woertman, L. and Van der Hart, O. (2003) "Inter-identity amnesia for neutral, episodic information in dissociative identity disorder." *Journal of Abnormal Psychology* 112. Pg 290-297.
- ⁷Huntjens, R., Peters, M., Woertman, L., Bovenschen, L., Martin, R. and Postma, A. (2006) "Inter-identity amnesia in dissociative identity disorder: A simulated memory impairment." *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences* 36.6. Pg 857-863.
- ⁸Kong, L., Allen, J. and Glisky, E. (2008) "Interidentity memory transfer in dissociative identity disorder." *Journal of Abnormal Psychology* 117. Pg 686-692.
- ⁹Huntjens, R., Peters, M., Woertman, L., Van der Hart, O. and Postma, A. (2007) "Memory transfer for emotionally valenced words between identities in dissociative identity disorder." *Behaviour Research and Therapy* 45.4. Pg 775-789.
- ¹⁰Peters, M., Uyterlinde, S., Consemulder, J. and Van der Hart, O. (1998) "Apparent amnesia on experimental memory tests in dissociative identity disorder: An exploratory study." *Consciousness and Cognition: An International Journal* 7.1. Pg 27-41.
- ¹¹Schacter, D. L. (1987) "Implicit memory: History and current status." *Journal of Experimental Psychology: Learning, Memory, and Cognition* 13.3. Pg 501-518.
- ¹²Miller, G. (1994) "The magical number seven, plus or minus two: Some limits on our capacity for processing information." *Psychological Review* 101.2. Pg 343-352.
- ¹³Logan, G. D. (1988) "Toward an instance theory of automatization." *Psychological Review* 95.4. Pg 492-527.
- ¹⁴Friedl, M. C., Draijer, N. and de Jonge, P. (2000) "Prevalence of dissociative disorders in psychiatric in-patients: The impact of study characteristics." *Acta Psychiatrica Scandinavica* 102.6. Pg 423-428.