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RESEARCH ARTICLE

PTSD TRAINING: A NEW APPROACH AND A NEW METHODOLOGY

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ABSTRACT

The present study compared individuals who were trained to report correct PTSD information to those who were not trained. The Operational Mobile Psychology Laboratory (OMPL) was developed to conduct an experiment in a natural field setting which allowed both random sampling and random assignment of participants. A three group design was utilized (PTSD Training Condition, Health Training Control Condition, and No Training Control Condition) (N = 322). The three conditions differed on Total PTSD Scores, Total Markov Scores, Total Process Scores, and Total Process Sigma Scores. Planned Orthogonal Comparisons indicated that the PTSD Training Condition was better at answering PTSD questions than the two Control Conditions and the two Control Conditions did not differ. These findings improve prediction of individual behavior in psychology experiments, increase internal and external validity, and supports the view that psychology is a stochastic, not a deterministic, science.

INTRODUCTION

In a recent review of Posttraumatic Stress Disorder (PTSD) research and treatment, and how PTSD specifically relates to forensic psychology, Kilbourne, Kilbourne, and Goodman (2014, 2015) concluded that most PTSD research and treatment has focusedon post-trauma and post-PTSD. They argued a conspicuous gap regarding prevention and early intervention exists in the PTSD literature. This gap is particularly alarming given: 1) 6.8 % of the U.S. population is estimated to have PTSD (National Comorbidity Survey Replication [NCS-R], 2005), 2) there are many faces to PTSD (i.e., combat veterans, disaster victims, first responders, children, and women [the largest effected group]) (Kilbourne & Kilbourne, 2012), and 3) PTSD is oftentimes a chronic, even lifelong disability, with cascading neurobiological, medical, psychological, social, occupational, legal, and economic effects (Kilbourne & Kilbourne, 2011).

Redirecting research and treatment away from "after" PTSD to "before" PTSD is no small matter. Conceptual, methodological, and meta-theoretical concernscompel researchers and practitioners to remain focused on what happens "after" PTSD. Conceptually, the DSM 5 states that PTSD symptoms must persist for one month before diagnostic criteria can be met. There fore, researchers and practitioners watch for the emergence of a diagnosis, rather than treat a diagnosis. Practitioners may elect to treat the early symptoms of trauma, however, per the DSM 5, these do no constitute the symptoms of PTSD. Methodologically, recent research has indicated that psychology experiments are difficult to replicate (Open Science Collaboration, 2015), which may be particularly relevant to PTSD research since no attempt has been made to systematically replicate PTSD research and treatment. Meta-theoretically, moving the focus from "after" to "before" PTSD tends to shift the emphasis to predicting individual behavior. Psychology experiments rely on group data to make group statistical comparisons which are unable to predict precise individual behavior in either treatment or control conditions, and, thus, are not well suited for prevention or early intervention studies (Kilbourne, Fleck, & Teirumniks, 1988; Kilbourne, Kilbourne, & Goodman, 2014). To address the individual predictability problem, Kilbourne et al (2014) recently introduced the use of the Regular Transitional Markov Matrix (RTMM) procedure in conjunction with traditional statistical analyses to predict individual behavior in social science research. The individual predictability problem in psychology research also draws into sharp relief that psychology is a stochastic science and not a deterministic science like physics.

The purpose of the present study was to train individuals to report correct PTSD information that could be helpful to individuals exposed to trauma, first responders who provide emergency trauma services, and to mental health practitioners who treat individuals that have suffered from trauma and/or

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PTSD (Kilbourne & Kilbourne, 2012; NCS-R, 2005; Schnurr, Friedman, & Bernardy, 2002; Tanielian & Jaycox, 2008). In order to advance protections of internal and external validity, a mobile psychology laboratory was developed to conduct an experiment in a natural field setting, which permitted both the random sampling of participants and the random assignment of participants to experimental conditions.

The mobile psychology laboratory was actually an interactive computer program that provided precise control over experimental procedures and manipulations. The mobile psychology laboratory moves Wundt's psychology experiment (1879) out of a stationary psychology laboratory (McLeod, 2008).

Lastly, the RTMM procedure first reported by Kilbourne, Kilbourne, and Goodman (2014) to calculate individual response probabilities in social science research was utilized to calculate individual response probabilities in a psychology experiment.

METHOD

Operational Mobile Psychology Laboratory

The present experiment employed the Operational Mobile Psychology Laboratory (OMPL) (Kilbourne, copy right 2015). The OMPL is a computer-based program which can be utilized on laptops, tablets, and/or smart phones, to conduct scientific experiments, tests, investigations, trainings, and/or observations of human behavior and mental processes. It is a computer-based program directly linked to the internet and which allows scientific data to be collected at any time or location where internet services are available. It can be backed-up off line onto cloud storage, separate servers, and/or a flash drive. The OMPL used a random number generator to randomly assign participants to experimental conditions. An SSL certificate kept all information in the study secure, data was coded using a salted hash technique, all data was stored on separate servers, and data was recorded/randomized so that data cannot be matched to a specific person by submission date and time.

Participants

A stratified random sampling procedure (Lin, 1976) was used to randomly select ten Starbucks coffee shops from the North County San Diego and Temecula, California areas and five interviewers were randomly assigned to the ten randomly selected Starbucks. Participants were approached in Starbucks and gave their informed consent. The computer program randomly assigned participants to one of the three treatment conditions. The total sample generated 510 participants. The interviewer, participant, and experimenter did not know the condition (s) of the study.

Participants completed the study in 10-15 minutes by using a laptop provided by the interviewer that connected to a secured website via the internet. All participants read and responded to six vignettes (i.e., three trauma vignettes and three normal stress vignettes) which were randomly assigned within the computer program to a fixed order. Timers within the computer program were used to control training time, vignette reading time, and vignette question time. Participants were debriefed following the completion of the study.

Treatment Conditions and Dependent Measures

The three treatment conditions were: 1) PTSD Training Condition - participants were given psychological trauma instruction, 2) Health Training Control Condition (i.e., to control for the Hawthorne Effect [Landsberger, 1958; Orne, 1962]) - participants were given instruction on how to maintain a healthy lifestyle, unrelated to psychological trauma, and 3) A No Training Control Condition - participants were given no training and no instruction.

Four dependent measures were constructed: 1) Total PTSD Score (all three conditions and all six vignettes) - this measure was based on the sum ofall participants' answers to the same five PTSD questions across all six vignettes (i.e., Could Develop PTSD, Persistence of PTSD Symptoms, Best Therapy for PTSD, Best Medications for PTSD, and Largest Group with PTSD); 2) Total Markov Score (all three conditions and the three Trauma Vignettes) - this measure was based on the sum of all Markov values in the "correct/correct" cell of the two transitional tables (i.e., Trauma Vignette 1 vs. Trauma Vignette 2 and Trauma Vignette 1 vs. Trauma Vignette 3) for each of the five PTSD questions; 3) Total Product Score (all three conditions and the three Trauma Vignettes)– this measure was based on the sum of all multiplied Markov Values in the "correct/correct" cell of the two transitional tables (see above) by the actual number of participants in the "correct/correct" cell for each of the five PTSD questions; and 4) Total Process Sigma Score (all three conditions and the three trauma vignettes)- this measure was based on the sum of all Process Sigma Values derived from the two transitional tables (see above) for each of the five PTSD questions and which compared total opportunities or answers to total defects or incorrect answers.

RESULTS

All reported analyses were based on the responses of full responders in the present study (N=322). Full responders correctly discriminated between trauma versus normal stress on all six vignettes (Process Sigma=2.61, $p \leq .01$) (iSixSigma, 2014; Reid, 2013) and indicated no significant differences in relation to age, gender, race, education, total vignette reading time, total vignette answering time, total vignette reading and answering time combined, and total difference scores (first versus last vignette) (all p's $\geq .200$). Significant differences in occupation were a statistical artifact of the high number of cells that had a cell size less than five (27 out of 45, or 60%).

Between Group Comparisons Across all Six Vignettes

A One-Way ANOVA was computed and indicated a significant difference between the three conditions on Total PTSD Scores ($F = 229.727$, $p = .000$, Eta Squared =.590). Planned Orthogonal Comparisons indicated the PTSD Training Condition differed on the Total PTSD Scorefrom The Health Training Control and the No Training Control Conditions combined (both t's assuming either equal or unequal variances$\geq$ -18.64, both p's = .000, two-tailed). The Health Training Control and the No Training Control Conditions did not significantly differ on Total PTSD Score (both t's assuming equal or unequalvariances

≤1.21, both p's ≥.23). These findings indicated that participants in the PTSD Training Condition were much more likely to report correct PTSD information across all six vignettes of the studythan participants in the two control conditions.

Between Group Comparisons Across the Three Trauma Vignettes

One-Way ANOV As were computed and indicated significant differences between the three treatment conditions on the Total Markov Score (TMS), Total Product Score (TPS), and Total Process Sigma Score (TPSS) (i.e. z-scores) across the three trauma vignettes (all F's ≥ 12.37, all p's = .000, Eta squared = .478). Planned Orthogonal Comparisons indicated the PTSD Training Condition differed on TMS ($\bar{X}$=.91), TPS ($\bar{X}$=.72.96), and TPSS ($\bar{X}$=2.92) from the Health Training Control and the No Training Control conditions combined ([TMS $\bar{X}$=.73], [TPS $\bar{X}$=20.37], [TPSS $\bar{X}$=2.14]) (all t's assuming equal and unequal variances ≥ -4.97, all p's = .000, two-tailed). The Health Training Control and the No Training Control Conditions did not significantly differ on the TMS, TPS, and TPSS (all t's assuming equal and unequal variances ≤ .120, all p's ≥ .91 [p's range from .91 to .995]). These findings indicated that participants in the PTSD Training Condition were much more likely to report correct PTSD answers on Trauma Vignettes 2 and 3 than participants in the two Control Conditions. Specifically, participants in the PTSD Training Condition indicated a 91% probability of making the same correct response in Trauma Vignettes 2 and 3 and there were three-and-a-half times more participants in the PTSD Training Condition that indicted this high probability response. A small percentage of participants in the two Control Conditions indicated pre-existing knowledge of PTSD and were successful in giving correct answers, a possible alternative explanation to the so-called Hawthorne effect.

CONCLUSION

Participants in the PTSD Training Condition were consistently better at answering PTSD questions and indicated a higher probability of providing correct PTSD at subsequent points in time than participants in the two control conditions. Such "knowledge-based" training could prove beneficial to potential victims, first responders, and to mental health practitioners prior to a traumatic event and/or the development of PTSD. These findings advance our ability to probabilistically predict individual behavior in a psychology experiment and further support the view that psychology is a stochastic, not deterministic, science (Kilbourne, Kilbourne, and Good man, 2014). The present study also introduced the OMPL, a mobile psychology laboratory directly linked to the internet, which increases our confidence in the internal and external validity of psychology experiments. Moreover, the OMPL can merge and / or interface with other computer programs (e.g., Excel, SPSS, biometric wearables, commercial drones, and artificial in telligence [AI] capabilities,etc.) and can be adapted to other scientific disciplines, species, and settings.

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