

Detrimental Effects of Post-Incident Debriefing on Memory and Psychological Responses

Helen M. Paterson · Keenan Whittle · Richard I. Kemp

Published online: 16 January 2014
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Abstract Emergency service personnel, such as police officers, firefighters and paramedics, often take part in Critical Incident Stress Debriefing (CISD; Mitchell, 1983) following exposure to traumatic events. However, there is evidence that these group debriefing sessions may actually increase the risk of PTSD and permanently distort the participants' memories for the events. This study compared the impact of two different elements of CISD on recall for an event and psychological well-being. In pairs, undergraduate students unknowingly viewed slightly different versions of a stressful video. Participants were then randomly allocated to one of three conditions: emotion-focused debriefing, fact-focused debriefing, or no debriefing. Participants who received fact-focused debriefing incorporated more misinformation into memory and also reported more intrusive thoughts about the video than the controls. Participants who received emotion-focused debriefing reported more confabulated items than participants in the control condition and reported more intrusive thoughts. These findings suggest that some aspects of CISD may be problematic. Therefore, it may be important to work toward the development of new, more effective post-trauma interventions.

Keywords Post-incident debriefing · PTSD · Memory · Conformity

Introduction

Emergency service personnel, such as police officers, firefighters and paramedics are frequently exposed to traumatic

events and this can result in an elevated risk of developing Post Traumatic Stress Disorder (PTSD; see Berger et al., 2012 for review). Therefore, it is essential that these personnel be provided with appropriate training and information in order to capably deal with the pressures that they face in the workplace.

For many years, Mitchell's (1983) Critical Incident Stress Debriefing (CISD) was considered to be the best method for helping emergency service personnel deal with the impact of traumatic events. Everly and Mitchell (1995) suggest that CISD should be administered post-trauma in a group setting, with its main aim being to reduce the impact of a traumatic event. Specifically, the procedure was designed to help prevent the development of PTSD, and also identify individuals at risk of developing psychological problems, so that appropriate care may be administered. This is done by asking participants to examine the event cognitively, then gradually introducing and dealing with emotional elements of the situation, and then finishing by sensitively returning to a cognitive focus at the end of the session. Educational elements are also incorporated into the process so that participants are able to better handle the psychological demands of the trauma. Ultimately, the process is an opportunity for the group to discuss their thoughts and emotions relating to the trauma in a controlled, rational manner.

The CISD procedure contains seven critical stages, all said to contribute equally to the cathartic process encouraged by discussion between participants. Everly and Mitchell (1995) describe these stages as follows:

1. Introduction – the debriefing process is explained to all participants, and the ground rules for the session are clearly established.
2. Fact Phase – participants each describe their memory for the event witnessed.
3. Thought Phase – participants each verbalise what their first thoughts were once they were consciously aware of their thoughts (i.e., once they had stopped running on adrenaline).

H. M. Paterson (✉) · K. Whittle
School of Psychology, The University of Sydney, Sydney 2006,
Australia
e-mail: helen.paterson@sydney.edu.au

R. I. Kemp
School of Psychology, University of New South Wales, Sydney,
Australia

4. Reaction Phase –participants discuss their emotions as they remember experiencing them during the height of the trauma.
5. Symptom Phase –participants identify and discuss the symptoms associated with the stress they are experiencing.
6. Teaching Phase –participants are taught useful strategies that aid in the reduction of stress caused by the trauma.
7. Re-entry –participants are encouraged to re-examine areas that they are still uncomfortable with. They may discuss new pieces of information, clarify issues that still hold weight for them, or ask whatever they need to in order to leave the session feeling satisfied.

CISD is popular within the law enforcement community (Miller, 2006) and its use is widespread (Deville, Gist & Cotton, 2006). Everly and Mitchell (1995) argue that there are many benefits of CISD. Firstly, CISD is administered in close temporal proximity to the event it examines and therefore allows individuals to immediately maintain order in a state of high chaos. Secondly, CISD allows the opportunity for catharsis or emotional release. However, the authors argue that it is not just catharsis, but the opportunity to verbalise the trauma, which is critical to effective recovery. Additionally, by first cognitively examining the event, individuals can more efficaciously deal with the emotional demands of the situation.

According to Everly and Mitchell (1995) another benefit of CISD is that it is often conducted in the context of a group discussion. When confronted with others sharing their traumatic experiences, individuals come to realise that they are not the only ones suffering and that others are in need of the same help. Further, individuals can model constructive coping behaviour to each other, and feelings of hope can result from sharing experiences in a supportive and non-judgemental context. Although the debriefing is conducted by a trained professional, the true benefits of the session result from the development of a supportive peer network. In an emergency service context, this would be particularly relevant as personnel face unique demands in the workplace compared to the rest of society. In other words, while a trained professional is more than capable of identifying problem areas that need to be addressed in overcoming trauma, it could be that individuals are likely to perceive a sense of greater understanding from those that undergo the same pressures as a result of their occupation.

Despite the theoretical rationale behind CISD, research has revealed that the CISD model, as currently used in the emergency services, provides little to no benefit for psychological health (e.g., McNally, Bryant & Ehlers, 2003; NICE, 2005; Rose, Bisson, Churchill, & Wessely, 2006). For example, a meta-analysis investigating the efficacy of debriefing interventions based on Mitchell's (1983) model revealed that there was no apparent difference in PTSD symptom change

between control participants and participants who had been debriefed after trauma (Litz, Gray, Bryant & Adler, 2002). They concluded that participants who underwent debriefing experienced a rate of symptom reduction comparable to that which would be observed by simply allowing time to pass. Similarly, in another meta-analysis Rose, Bisson and Wessely (2003) found that even though individuals who received post-incident debriefing typically believed that the procedure was effective, this belief was not supported by objective ratings of their PTSD symptomatology. The authors concluded that psychological debriefing practices provided little benefit and did not reduce symptoms of post-traumatic stress.

While the above studies suggest that CISD may have no beneficial effects to psychological health, several studies have revealed that psychological debriefing may, in fact, be detrimental. Firstly, Bisson, Jenkins, Alexander, and Bannister (1997) assessed adult burn victims for symptoms of PTSD and then randomly assigned them to either a debriefing condition or a no debriefing control condition. Participants were then assessed for level of symptomatology after three and thirteen months. Overall, there were significantly more participants in the debriefing condition who were assessed as having PTSD (26 %) compared to controls (9 %) at the 13-month follow up. Participants who received debriefing were less content, rated the trauma as having greater impact upon their lives and also reported higher levels of anxiety as indexed by the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). Secondly, Mayou, Ehlers and Hobbs (2000) examined PTSD symptomatology in survivors of motor vehicle accidents and found that individuals who experienced PTSD symptomatology post-accident and were not subjected to a debriefing intervention managed to recover from their PTSD symptoms, while individuals who had received debriefing were still assessed as symptomatic.

Explanations for the detrimental outcomes of CISD have focused on its requirement for participants to re-experience the traumatic event and make the memory of trauma more vivid (Deville & Varker, 2008; Devilly, Gist & Cotton, 2006). For example, Brewin, Andrews, Rose, and Kirk (1999) found that re-experiencing and arousal symptoms in individuals were the best predictors of PTSD. They even suggest that an easy way of predicting the onset of the disorder would be to count the number of re-experiencing and arousal symptoms. Furthermore, Berntsen, Willert and Rubin (2003) discuss PTSD in the context of the "landmark view" of trauma memories, and investigate the possibility that highly emotional memories play the role of memory markers for individuals. That is, the authors suggest that memories of a higher emotional intensity are better remembered and help to organise and clarify autobiographical memory. Autobiographical memories are, "Episodes recollected from an individual's life (Williams, Conway, & Cohen, 2008, p. 22). According to the theory, these

emotional landmarks give meaning to related events and invade thought processes depending on how much they help to organise autobiographical memory. It was found that emotional landmarks were stronger reference points for those who displayed a PTSD symptom profile. In other words, the reported traumatic events were remembered more vividly and with more intensity. These individuals reported a more intense reliving experience of the traumatic event, and the authors concluded that, for those with a PTSD symptom profile, the memory of the traumatic event had become highly accessible.

In light of this research, we must question whether it is beneficial for CISD to contain a stage (i.e., the *reaction* phase) that requires participants to relive and re-experience a traumatic event in an unstructured environment (i.e., unlike imaginal exposure which consists of a prolonged and structured reliving of the trauma). It is possible that this task would make the emotional memory of trauma more vivid and more accessible for individuals and, consequently, increase the likelihood that individuals will develop psychopathology. However, no known study has attempted to investigate whether re-experiencing the trauma during the *reaction* phase of debriefing can itself account for increased PTSD symptomatology.

Therefore, the first aim of the present investigation was to investigate whether discussing emotional reactions to a stressful event (as in the *reaction* phase of CISD) may result in detrimental effects on psychological responses. If this link can be made, then when designing potential new interventions to combat the effects of trauma, stages detailing these requirements can be omitted or refined so that the negative effects for psychological health are minimised.

The current research also investigates an additional potential problem associated with post-incident debriefing in a group environment – contamination and distortion of the participants' memories of the events they witnessed. In a series of landmark experiments, Loftus (see 2005 for review) demonstrated that individuals can unknowingly incorporate erroneous postevent information into memory, a phenomenon now known as the 'misinformation effect'. Of the avenues through which misinformation can be encountered (e.g., leading questions, media reports, co-witness discussion), discussion of information between individuals has the strongest impact on memory accuracy (Gabbert, Memon, Allan, & Wright, 2004; Paterson & Kemp, 2006). That is, discussing an event with another individual who witnessed the same event can lead to high levels of memory contamination (e.g., Gabbert, Memon, & Allan, 2003; Gabbert & Hope, 2013; Harris, Paterson, & Kemp, 2008; Paterson, Kemp, & McIntyre, 2011; Paterson, Kemp & Ng, 2011). This phenomenon has come to be known as 'memory conformity' (Wright, Self, & Justice, 2000). As CISD consists of group discussion, it is possible that the procedure could lead to memory conformity among participants. Memory contamination within the

emergency services is of particular concern because emergency service personnel are routinely required to give evidence to courts, internal enquiries, and other investigations.

This negative effect of co-witness discussion on memory has been widely recognised in a legal context, with recent research revealing that police officers often attempt to separate co-witnesses and discourage them from talking about an event with each other in order to preserve the validity of testimony (Paterson & Kemp, 2005). In light of this, there may be consequences for procedures, like CISD, that require personnel to discuss the event they have witnessed. The relative lack of concern regarding the use of CISD in this context could be due to the fact that, for example, some emergency service personnel believe their memories for events to be more objective than civilians (Paterson & Kemp, 2005) and that discussion amongst colleagues actually promotes more accurate memory when writing formal reports. However, while these personnel generally report more confidence in their memories, it has been shown that police officers are no more accurate than civilians in remembering events (Ost, Green & Cherryman, 2004) and they are also susceptible to effects of postevent misinformation (Granhag, Memon, Gabbert, & Allwood, 2004). As a result there is reason to be concerned that the use of these debriefing procedures may distort memories for important events.

Indeed, one known study has highlighted that this concern is well founded. Devilly, Varker, Hansen, and Gist (2007) showed participants a stressful video of a car accident and then randomly allocated them to one of three conditions. Participants either received 1) critical incident debriefing, 2) debriefing with a confederate supplying misinformation, or 3) no treatment. As hypothesised, participants in the debriefing with confederate condition were more likely to recall information that they did not actually observe in the video (i.e., misinformation that was provided by the confederate) than participants in the other conditions. This study suggests that the misinformation effect can occur within a psychological debriefing context, however it is unclear which component or aspect of CISD might be responsible for the findings.

In the *fact* phase of the CISD the group discusses factual elements of the event in order to collaboratively gain a more complete understanding of the event. As research has shown that discussion between individuals is particularly likely to result in the transfer of misinformation (Paterson & Kemp, 2006; Gabbert et al., 2004), it is possible that this phase of CISD could be particularly likely to promote the transfer of misinformation from one witness to another. Therefore, the second aim of the present investigation was to build upon research by Devilly et al. (2007) by attempting to identify whether requiring participants to collaboratively recall factual details of a shared traumatic event, results in detrimental effects on eyewitness memory.

In the present study participants were tested in pairs and were simultaneously shown, on separate computer monitors, a mildly stressful video. They were led to believe that they were viewing the same video when, in actual fact, the videos differed with regard to several key items of information. After viewing the videos, participants were randomly allocated one of three debriefing conditions: 1) a debriefing procedure in which they were instructed to share only their emotional reactions to the video, 2) a debriefing procedure in which they were instructed to only discuss the factual content of the video, or 3) no debriefing at all.

It was hypothesised that participants who received an emotion-focused debriefing would score higher on measures of stress and anxiety compared to participants in the other conditions. This is because these participants would be required to recall and re-experience the negative emotions that the video evoked (Brewin et al., 1999). Secondly, it was hypothesised that participants who received a fact-focused debriefing would be more susceptible to the misinformation effect compared to participants in the other conditions. That is, when asked to complete tasks that tested their memory of information contained in the video, participants in this condition would be more likely to report recalling information from the alternative version of the video, which they could have only be exposed to via discussion with their experiment partner. This is because their debriefing procedure would require them to collaboratively recall factual information from the video in their pairs, which would allow for participants to contaminate each other's memories (e.g., Gabbert et al., 2003; Gabbert & Hope, 2013; Harris, Paterson, & Kemp, 2008; Paterson, Kemp, & McIntyre, 2011; Paterson, Kemp & Ng, 2011).

In addition to assessing the accuracy of participants' memories, the current study also investigated how confident the witnesses are about their memories. It is important to assess eyewitness confidence because it can have a strong influence on future events in the legal process (Wells et al., 2000). For example, confidence levels may affect a witness's willingness to testify in court. Furthermore, it may also affect the way other people (such as police investigators or jury members) view the reliability of the witness statement. In line with previous research, it was hypothesised that misled participants would have as much confidence in their mistaken recognition judgments as non-misled participants who are considerably more accurate (e.g., Loftus, Donders, Hoffman, & Schooler, 1989).

Method

Design

There were three phases in this study: the exposure phase, the debriefing phase, and the reaction/recall phase. During the

exposure phase, participants saw one of two slightly different versions of a stressful video of an autopsy (Version A or B). In the debriefing phase, participants were randomly assigned to one of three conditions (emotion-focused debriefing, fact-focused debriefing, no debriefing). Participants in the emotion-focused and fact-focused debriefing groups discussed the video with a partner who had, unbeknownst to them, seen the alternative version of the video. Participants in the no debriefing control group did not discuss the video and instead wrote individually about what they did on the weekend. During the reaction/recall phase, participants worked individually to complete questionnaires regarding their psychological reactions to the event, memory for the event, and confidence in their memories.

Participants

The sample consisted of 74 first year university students (42 female) with ages ranging from 17 to 25 years ($M=19.08$, $SD=1.63$). Participants were randomly allocated to one of three conditions: factual debriefing ($n=24$), emotional debriefing ($n=26$), or control ($n=24$). Participants received course credit in exchange for their participation. Data from three participants were excluded from the analyses as the participants indicated, at the conclusion of the experiment, that they had had prior exposure to medical material. This prior exposure would have been likely to make them less affected by the nature of the autopsy video and also less susceptible to the misinformation, since some of the misinformation relating to the medical procedure was not factually correct. None of the participants expressed awareness that they might have been shown a slightly different video from their partner, so the experimental manipulation was considered successful and no participants were excluded from the analyses for this reason.

Materials

Visual stimuli. The visual stimulus used in this study was a video depicting a forensic autopsy. The five minute presentation depicted real footage of the removal of a skull cap, the removal of the brain from the cranial cavity, and then its subsequent inspection and preparation for further dissection. To create the misinformation paradigm, two slightly different versions of the video, Version A and Version B, were shown to participants. This methodology has been used successfully in previous studies (see Gabbert & Hope, 2013; Harris, Paterson, & Kemp, 2008 for reviews). Table 1 summarises all of the differences between the videos. The autopsy footage was selected because a previous study indicated that it significantly increased participant stress responses immediately following viewing, as well as led to a misinformation effect when the

Table 1 Differences in information presented to participants as a consequence of viewing video version A or video version B

	Video stimuli	
	Version A	Version B
Date body discovered	25th January, 2005	25 th February, 2005
Location of body	Car Park	Park
Location of trauma	Head and neck	Head and legs
Length of time serial killer at large	Three years	Two years
Number of bodies found at murder scene	Two	Information not mentioned
Details about differences between murder victims	Information not mentioned	The victim described in the video differed as he was much older than other victims of the serial killer
Suggestion of how trauma to the head occurred	Forceful bodily violence on the part of the serial killer	Slamming the victims head against an object: perhaps the side of a car
Disease clusters on brain surface	Identified as meningitis	Only identified as disease clusters, not meningitis
Time needed for brain to harden in fixing solution	Information not mentioned	Five to six weeks

differing content was discussed among participants (Monds, Paterson, & Whittle, 2013).

Anxiety, intrusions, and avoidance measures. Psychological responses were assessed using two measures. Firstly, an adapted version of the Impact of Events Scale (IES; Horowitz, Wilner & Alvarez, 1979) was used to assess the impact of the video on the participants. In its original form the IES is a 15-item, four-point Likert scale. This measure has been shown to be valid and reliable (see Sundin & Horowitz, 2002, for review) and it has been used widely in research to assess the impact of stressful life events upon individuals on two dimensions: levels of intrusion and levels of avoidance. Intrusion items refer to unbidden thoughts or behaviour, sudden waves or pangs of feelings, and repetitive behaviour (e.g., “I had waves of strong feelings about it”). Avoidance items refer to blunted sensation, behavioural inhibition or counter-phobic activity, and awareness of emotional numbness (e.g., “I tried not to think about it”). As in Monds, Paterson and Whittle (2013), four items in the original scale were removed from the questionnaire (items 4, 6, 7, and 9) as they related to things the participants could not have done during the course of the experiment (e.g., “I had trouble falling asleep or staying asleep because of pictures or thoughts that came into my mind”). Participants responded using a six-point Likert scale (as used in Graaugard, Holgerson, Eide & Finset, 2005).

Anxiety was assessed using the state measure from the State-Trait Anxiety Inventory (STAI; Spielberger, 1984). The 20-item measure requires participants to rate how well particular positive (e.g., “calm”) and negative (e.g., “anxious”) emotions apply to them on a four-point likert scale. The STAI was administered twice; at the commencement of the testing period, and after the experimental manipulation had occurred.

Memory measures. Memory was assessed using two tests: a free recall task, and a recognition task. The free recall task required participants to write about the video. In particular, they were instructed to write as much information as possible about the situation surrounding the crime and also information about the procedures performed in the video. The recognition task was a 28-item true/false questionnaire. For each item, participants were asked to indicate whether the statement was true or false and state their confidence in their response on a scale ranging from ranging from 1 (Extremely unsure) to 5 (Extremely confident). Of the 28 items, 9 related to the differences between the two videos (e.g., “The body was discovered on the 25th January). For these items, whether the answer participants gave was correct or incorrect depended on the version of the video that they viewed. Of the remaining 19 items, 9 were true and 10 were false answers regardless of the version of the video the participant had viewed.

Procedure

Participants completed the experiment in pairs. Two identical computer workstations were set up next to each other in a way that ensured each participant’s view of their partner’s screen was obstructed. Participants arrived individually and were seated in front of one of the two computers. At the commencement of the session participants were warned that they would be viewing a video of a forensic autopsy. At this point all participants were reminded that they were allowed to withdraw their consent to participate at any time and informed that, should they need it, they would be given the contact details of a clinical psychologist who would provide support.

After giving consent each participant completed the STAI on their computer (STAI-1). The participants were then told that they would watch the video on individual computer

terminals, so they could each see it under equal and optimal viewing conditions. Unbeknownst to the participants, the computers they were using had been loaded with different versions of the video (i.e., one participant saw Version A of the video and the other saw Version B). Participants were informed that they should pay close attention to the video. After the video finished they completed a filler task for approximately five minutes.

At this point, participants were randomly assigned to one of three conditions. Participants in the control condition were asked to individually write down what they did on the previous weekend. Participants in the emotion-focused debriefing condition were asked to discuss the emotional reactions they experienced while watching the video, and they were instructed not to speak about any factual content contained within the video. These instructions were given as they correspond to the instructions given during the *reaction* phase of CISD (Everly & Mitchell, 1995). Participants in the fact-focused debriefing condition were asked to discuss the factual content of the video, and they were instructed not to discuss any emotional reaction they had to the video. These instructions correspond with the instructions given during the *fact* phase in CISD (Everly & Mitchell, 1995). Participants in the fact-focused and emotion-focused debriefing conditions were informed that their discussion would be tape-recorded. Discussions were recorded so that we could ensure that all participants followed their instructions. At this point the experimenter started the tape recorder and left the participants to have their discussion. The time taken to complete this section of the experiment in all three conditions was approximately 5–10 minutes.

After participants in all three conditions had completed their respective tasks, they were asked to individually complete the IES-adapted and a second administration of the STAI (STAI-2). Participants were then given the memory questionnaires. After completing these tasks, participants were fully debriefed on the purposes of the study and were provided with the contact details of a clinical psychologist. Participants were reminded that should they feel the need to further discuss the video used in this experiment they should not hesitate in using this service.

Results

Statistical analysis focused on the following questions: firstly, were the groups matched in their level of anxiety at baseline? Secondly, how did the style of debriefing (fact-focused, emotion-focused, no debriefing) affect self-reported anxiety, intrusions, and avoidance? Also, how did the style of debriefing affect participants' memory accuracy? Finally, were there observable differences in participants' confidence in their memories?

Baseline Anxiety

STAI-1. Participants' levels of anxiety before the experimental manipulation were analysed to determine if there were differences between conditions at baseline. The scores of three participants who did not correctly complete the first administration of the STAI-1 were excluded from this analysis. A one-way ANOVA revealed that there was no main effect of condition on levels of anxiety before the experiment had begun, $F(2, 65)=0.095, p=.91$; partial $\eta^2=.003$.

Psychological Responses

To assess the impact of the debriefing on anxiety, intrusions, and avoidance, the STAI-2 and the IES-adapted were administered to participants. Scores on the IES-adapted were divided into avoidance and intrusion scores. Separate one-way ANOVAs were conducted to examine the effects of debriefing style (fact-focused, emotion-focused, no debriefing) on self-reported ratings of intrusions, avoidance, and anxiety.

IES-Intrusion. A one-way ANOVA revealed a significant main effect of debriefing type on IES-intrusion scores, $F(2, 68)=5.45, p=.006$; partial $\eta^2=.14$ (see Fig. 1). As endorsed by Seaman, Levin and Serlin (1991) Fisher LSD post hoc tests were conducted, revealing that participants in the fact-focused debriefing condition ($M=2.31, SD=1.20$) reported more intrusive thoughts about the video compared to participants in the control condition ($M=1.19, SD=1.33, p=.002$). Additionally, participants who received emotion-focused debriefing ($M=2.00, SD=1.05$) tended to report more intrusive thoughts about the video than participants in the control condition ($p=.02$). No significant difference was observed between participants in the emotion-focused and fact-focused debriefing conditions, $p=.38$.

IES-Avoidance. A one-way ANOVA did not reveal any differences between the debriefing types on IES-avoidance scores, $F(2, 68)=0.35, p=.71$; partial $\eta^2=.01$ (see Fig. 1).

STAI-2. A one-way ANOVA did not reveal any differences between the debriefing types on scores for the second administration of the STAI, $F(2, 68)=0.38, p=.68$; partial $\eta^2=.01$ (see Fig. 1).

Memory for the Event

Free Recall Coding. The free recall task was coded by two raters who were blind to the debriefing condition to which the participants had been allocated. Responses were coded for: 1) correct items (one point was allocated for every item of information that was correctly recalled from the video), 2) misinformation (one point was allocated for any item reported that was present in the alternative version of the video to the

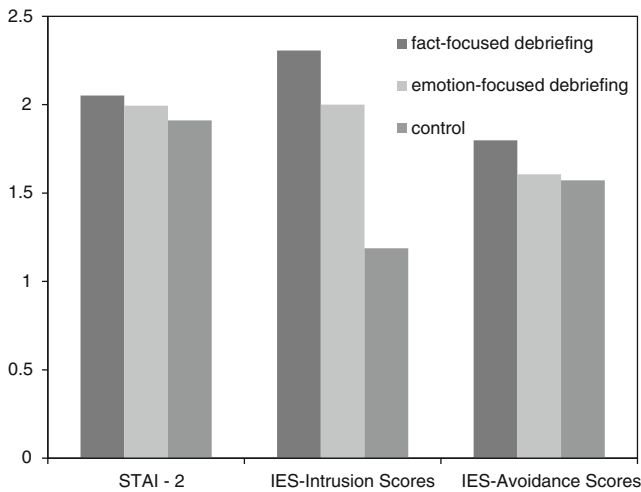


Fig. 1 The effects of debriefing condition on psychological responses

one seen by the participant. For example, if a participant who saw Version A of the video reported that the body was discovered in February this would be counted as misinformation), and 3) Confabulation (one point was allocated for each item of erroneous information that was not contained in either version of the video. For example, if a participant reported that the body was discovered in March this would be counted as confabulation). The free recall responses of 10 participants were scored by both raters, to assess inter-rater reliability. Significant correlations between raters were observed for correct items ($r=0.88$, $p<.005$), misinformation items ($r=1.00$, $p<.005$) and confabulation items ($r=0.89$, $p<.005$), indicating a good level of agreement between raters.

Free Recall Memory Accuracy. Separate one-way ANOVAs were conducted to investigate the effects of debriefing type (fact-focused, emotion-focused, no debriefing) on three separate dependent variables: correct items reported, misinformation items reported, and confabulation items reported.

A one-way ANOVA revealed a significant main effect of debriefing type on misinformation items reported, $F(2, 68)=14.38$, $p<.005$; partial $\eta^2=.30$ (see Table 2). A subsequent Fisher LSD analysis revealed that participants in the fact-focused debriefing condition reported significantly more misinformation items than participants in the emotion-focused debriefing condition ($p<.005$) and participants in the control condition ($p<.005$). There was no significant difference observed between participants in the emotion-focused debriefing and control conditions, $p=.73$. When misinformation proportion was calculated (items of misinformation recalled divided by the total items recalled [correct items+misinformation items+confabulation items]), the same pattern of results was found, $F(2, 68)=11.52$, $p<.005$; partial $\eta^2=.25$ (see Table 2).

A separate ANOVA revealed a significant main effect of debriefing type on confabulation items, $F(2, 68)=5.09$, $p=.009$; partial $\eta^2=.13$ (see Table 2). A Fisher LSD analysis

revealed that for the free recall responses participants in the emotion-focused debriefing condition confabulated more items compared to participants in the control condition ($p=.002$). No other significant differences between conditions were observed for confabulation items, all $p's>.05$.

No significant main effect of debriefing type was observed for items correctly recalled, $F(2, 68)=1.59$, $p=.21$; partial $\eta^2=.05$ (see Table 2). However, when proportion correct was calculated (items correctly recalled divided by the total items recalled [correct items+misinformation items+confabulation items]), there was a significant effect of debriefing type, $F(2, 68)=5.48$, $p<.01$; partial $\eta^2=.14$ (see Table 2). A Fisher LSD analysis revealed that participants in the control condition were significantly more accurate than participants in the emotion-focused debriefing condition ($p=.003$) and participants in the fact-focused debriefing condition ($p=.01$). There was no significant difference observed between participants in the emotion-focused debriefing and fact-focused conditions, $p=.75$.

Recognition Memory Accuracy. Of the 28 items contained in the recognition questionnaire, 9 were directly related to the items of misinformation that differed between the two versions of the video (hereafter known as “target” items), and 19 questions examined participants’ knowledge for other facts and details contained within the stimuli (hereafter known as “neutral” items). For target items, accuracy was determined depending on the version of the video the participant had viewed. Aggregate scores were created and converted to percentages for target and neutral items, such that higher percentages indicated greater accuracy in responding. To analyse participant responses, separate one-way ANOVAs were conducted to examine the effect of debriefing type (fact-focused, emotion-focused, no debriefing) on accuracy for target and neutral items (1 participant did not complete the recognition questionnaire correctly, and was excluded from this analysis).

A one-way ANOVA revealed a significant main effect of debriefing type on recall for target items, $F(2, 67)=6.12$, $p=.004$; partial $\eta^2=.15$ (see Fig. 2). A Fisher LSD analysis revealed that participants in the fact-focused debriefing condition showed poorer accuracy ($M=58.20$, $SD=13.57$) when responding to target items compared to participants in the emotion-focused debriefing condition ($M=72.00$, $SD=15.09$, $p=.003$) and participants in the control condition ($M=71.76$, $SD=16.04$, $p=.004$). There was no significant difference observed between participants in the emotion-focused debriefing and control conditions, $p=0.96$. A separate ANOVA did not reveal any differences between the debriefing types on accuracy for neutral items, $F(2, 67)=0.63$, $p=.54$; partial $\eta^2=.02$ (see Fig. 2).

Confidence Ratings of Correct and Incorrect Responses to Target Items. Confidence was calculated so that it reflected confidence in incorrect responses separately from correct

Table 2 Cell means for number of correct, misinformation and confabulation items coded in free recall responses for each debriefing condition

		Free recall responses				
		Correct items	Misinformation items	Confabulation items	Proportion correct (%)	Proportion misinformation (%)
Debriefing received	Emotion-focused	21.72 (6.85)	0.16 (0.37)	2.64 (2.18)	88.15 (8.14)	0.88 (2.11)
	Fact-focused	25.00 (5.95)	1.18 (1.30)	1.83 (1.22)	88.80 (6.30)	4.45 (4.89)
	Control	22.29 (7.03)	0.08 (0.28)	1.21 (1.02)	94.07 (5.60)	0.42 (1.42)

Note. *SDs* are in parentheses

responses to target items on the recognition questionnaire. Confidence scores for incorrect responses and correct responses to target items were averaged and then analysed using separate one-way ANOVAs (one participant did not complete the recognition questionnaire correctly and was excluded from this analysis).

The ANOVA revealed a main effect of debriefing type on confidence in incorrect responses to target items, $F(2, 67) = 19.81$, $p < .005$; partial $\eta^2 = .37$ (see Fig. 3). A Fisher LSD analysis revealed that participants in the fact-focused debriefing condition were more confident in their incorrect responses to target items ($M = 1.62$, $SD = 0.56$) than participants in the emotion-focused debriefing condition ($M = 0.78$, $SD = 0.40$, $p < .005$) and the control condition ($M = 0.83$, $SD = 0.53$, $p < 0.05$). There was no significant difference observed between participants in the emotion-focused debriefing and control conditions, $p = .74$.

A separate one-way ANOVA revealed that there were no differences between the debriefing types on participants' confidence in correct responses to target items, $F(2, 67) = 2.30$, $p = .11$; partial $\eta^2 = .06$.

Discussion

The results from the current study suggest that some aspects of a widely adopted psychological debriefing practice may be

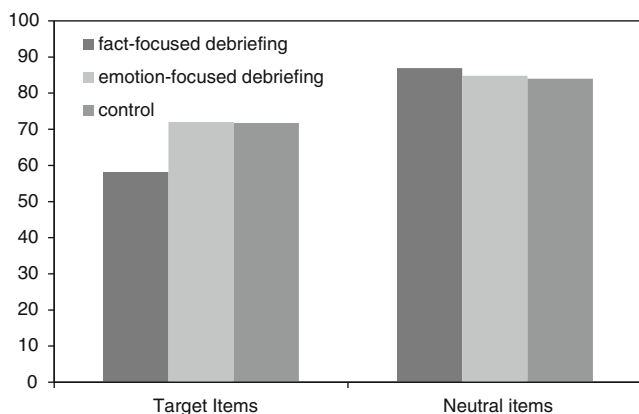


Fig. 2 The effects of debriefing condition on recognition memory accuracy for target and neutral items

detrimental to individuals taking part, at least in the short-term. In particular, this study revealed that participants who received fact-focused debriefing incorporated more misinformation into memory, and reported more intrusive thoughts shortly after the procedure than did the controls. Furthermore, participants who received emotion-focused debriefing reported more confabulated items than participants in the control condition and reported more intrusive thoughts. Finally, participants in the control condition gave more accurate free recall responses than participants in the emotion-focused and fact-focused debriefing conditions.

The first aim of our study was to investigate whether discussing emotional reactions to a stressful event (as in the reaction phase of CISD) may result in detrimental effects on anxiety, avoidance, and intrusions. We found partial support for this hypothesis in that participants who had received emotion-focused debriefing reported more intrusive thoughts about the video than participants in the no debriefing control condition. It is possible that the participants' discussion of their initial emotional response to the stressful video served as a re-experiencing mechanism that strengthened their stress response to the point where these emotions, and the images that aroused these emotions, became highly accessible. This discussion not only re-exposed participants to their own memories for the emotions they experienced while watching the video but also exposed them to the emotional memories of other individuals which could have served to further heighten their stress response. These results provide some suggestion

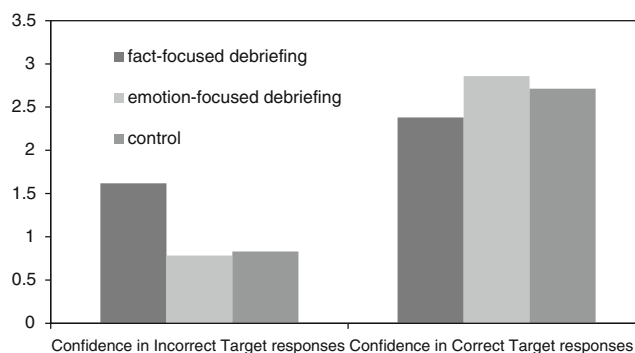


Fig. 3 The effects of debriefing condition on confidence for correct and incorrect responses to target items

that the reaction phase of CISD might be problematic, however intrusions were measured only 5 minutes after the discussion. The full impact of this phase on intrusions needs to be assessed in a longer-term follow-up.

An unexpected finding was that participants who received fact-focused debriefing reported more intrusive thoughts about the stressful video compared to participants who received no debriefing at all. Instructions given to participants in the fact-focused debriefing required them to avoid discussing their emotional reaction to the video. Focusing on facts, at the expense of attending to the emotional aspects, might have limited their emotional processing of the event, thus resulting in more intrusive thoughts (Foa & Kozak, 1986).

The second main aim of the present investigation was to investigate whether discussing the factual elements of a stressful event (as in the *fact* phase of CISD) results in detrimental effects on eyewitness memory. It was found that compared to participants in other conditions, those who received fact-focused debriefing were more likely to report misinformation (i.e., information contained only in the version of the video which they had not seen) on both a free recall and recognition measure of memory. Furthermore participants who received fact-focused debriefing were also more confident in their incorrect answers than participants in other conditions. These findings provide strong support for our second hypothesis that participants taking part in a fact-focused debriefing would be more susceptible to misinformation than participants in other conditions. These findings are consistent with research showing that discussion between individuals can lead to the transfer of misinformation (e.g., Gabbert et al., 2003; Gabbert & Hope, 2013; Harris, Paterson, & Kemp, 2008; Paterson, Kemp, & McIntyre, 2011; Paterson, Kemp & Ng, 2011). More importantly though, these findings build on research by Devilly et al. (2007) and Monds et al. (2013) who have found that it is possible for misinformation to be transferred in a post-trauma debriefing context. While Devilly et al. (2007) identified that CISD was problematic in terms of its effects on eyewitness memory, the present investigation has narrowed the focus to one of the phases of the procedure which appears to be particularly problematic. Therefore, it may be beneficial to avoid having debriefing participants discuss factual details of an event as this could lead to memory conformity.

It was also observed that participants in the emotion-focused debriefing condition confabulated more (i.e., reported more erroneous information that was not contained in either version of the video) compared to participants in other conditions. Participants in this condition were explicitly instructed to avoid discussing the factual details of the video presented. This increased confabulation in the emotion-focused condition cannot be attributed to the fact that these participants did not have the opportunity for their erroneous memories to be corrected by other group members as participants in the control condition were similarly unable to discuss factual details

but didn't show this increased rate of confabulation. Furthermore, as there were no significant differences observed between debriefing conditions in the number of correct items recalled during the free recall task, this explanation is problematic. A more plausible explanation for this result is that the instructions given to participants in the emotion-focused debriefing condition caused a shift in criteria when responding on the free recall task. Participants in this debriefing condition were explicitly told to only discuss the emotions they experienced while viewing the video, and to avoid discussing its factual content. Consequently, for the rest of the experiment, participants in this condition may have been more focused on emotion, while the accuracy of factual content may have been perceived to be less important. This may have resulted in a more lax criterion being adopted which resulted in an increase in false reports.

Since the current study revealed that fact-focused debriefing leads to increased memory conformity and emotion-focused debriefing leads to increased confabulations, it appears that both types of debriefing may be detrimental to memory for the event. Indeed, when considering proportion correct, it was found that participants in the control condition gave significantly more accurate free recall responses than participants in the fact-focused and emotion-focused debriefing conditions. These detrimental effects of debriefing could be avoided by delaying debriefing until after individual testimonies have been recorded or delivering debriefing to individuals rather than groups, although future research would need to investigate the efficacy of these methodologies. Alternatively, it may be the case that CISD, if delivered without the fact phase and reaction phase, would not result in these detrimental effects, although again, this would need to be tested.

While the present research has identified two potentially problematic aspects of CISD, it is not without limitations. First, caution must be exercised in the generalisation of these results to the real-world. The present study was a laboratory simulation and did not involve real trauma victims and only studied the impact of the debriefing over the course of a few minutes. Investigating responses to a real trauma and studying the reaction over a longer delay would enable us to determine the long-term effects of the debriefing procedures studied here. Second, the present study was limited in its use of a relatively small sample size. A larger sample size would have better represented the population and may have allowed us to detect more significant differences between the conditions. A final limitation of the study is that it only investigated two stages of CISD's seven stages. This said, there is clear theoretical evidence to suggest that the *reaction* and *fact* phases would be potentially problematic in terms of psychological responses and recall of events. While the other stages may also have consequences, the strongest links, as identified in the literature, to psychological instability and memory

contamination appear to be through the two stages investigated in the present study. However, future research could aim to investigate the role that other stages within the process play in contributing to these outcomes.

Despite these limitations, the present study still found important results which could, with further research, be used to inform the development of new, more effective post-trauma interventions. In particular, it was found that fact-focused debriefing appears to be problematic in that participants incorporated more misinformation into memory and reported more intrusive thoughts about the video than the controls. Furthermore, emotion-focused debriefing also appears to be problematic in that participants confabulated items more than the control condition and reported more intrusive thoughts. Developing a procedure that not only combats PTSD but also minimises the potential for memory contamination within debriefing would help to ensure that emergency service personnel maintain good psychological health, and at the same time preserve the integrity of their memories for courts, enquiries, internal investigations, and other official investigations.

Acknowledgments A special thanks to Michelle Moulds for her helpful and insightful comments on our manuscript. This research was supported by an Australian Research Council Linkage Grant (LP0989719).

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