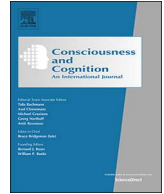




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Intensity and memory characteristics of near-death experiences

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ABSTRACT

Memories of Near-Death Experiences (NDEs) seem to be very detailed and stable over time. At present, there is still no satisfactory explanation for the NDEs' rich phenomenology. Here we compared phenomenological characteristics of NDE memories with the reported experience's intensity. We included 152 individuals with a self-reported "classical" NDE (i.e. occurring in life-threatening conditions). All participants completed a mailed questionnaire that included a measure of phenomenological characteristics of memories (the Memory Characteristics Questionnaire; MCQ) and a measure of NDE's intensity (the Greyson NDE scale). Greyson NDE scale total score was positively correlated with MCQ total score, suggesting that participants who described more intense NDEs also reported more phenomenological memory characteristics of NDE. Using MCQ items, our study also showed that NDE's intensity is associated in particular with sensory details, personal importance and reactivation frequency variables.

1. Introduction

Since the expression "Near-Death Experience" (NDE) was first used in literature to describe memory of impending death situations (Heim, 1891), further work has been devoted to this type of experience in an attempt to understand its singularity. Nonetheless, very few scientific articles have examined the particularity of NDE memories (see Greyson, 2007; Palmieri et al., 2014; Thonnard et al., 2013; van Lommel, 2011). Although there is not yet a consensus on the definition of NDEs, those experiences have been described as "profound psychological events with transcendental and mystical elements typically occurring to individuals close to death or in situations of intense physical or emotional danger" (Greyson, 2000a). As a result of this intense experience, near-death experiencers (NDErs) usually report very detailed memories (Thonnard et al., 2013) that seem to be unchanged over time (Greyson, 2007). From a cognitive perspective, to date no theory can explain the rich phenomenology associated with NDE memories (Palmieri et al., 2014; Thonnard et al., 2013; van Lommel, 2011). Thus, one interesting issue is why such a clear memory trace is created for this experience and little is known about what exactly accounts for the enhanced memory.

For some years now, more and more NDErs' testimonies have been compiled which demonstrate the compelling intensity of this experience (Moody, 1975; Ring, 1980). While reported narratives appear to contain similarities and recurrent components (i.e. elements frequently reported by NDErs; e.g. feeling of peacefulness, out-of-body experiences (OBES); Blanke & Dieguez, 2009; Charland-Verville et al., 2014; Facco & Agrillo, 2012), differences in terms of experience intensity (i.e. the depth of the experience) are reported (Charland-Verville et al., 2014). Notably, it seems that the intensity of NDE components differs when comparing NDErs

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recruited in retrospective versus prospective studies –all features seem more frequently reported in retrospective as compared to prospective studies (Charland-Verville et al., 2014; Mobbs & Watt, 2011). Finally, in some cases, NDEs are so intense that the NDErs will considerably change their personal attitudes, beliefs, and set of values (e.g. a decreased fear of death, an increase in spirituality, a greater appreciation of life) in a sustainable manner (Bauer, 1985; van Lommel, van Wees, Meyers, & Elfferich, 2001).

Because the scientific literature devoted to the investigation of NDE memories is limited, one may attempt to better understand their particularities using the broader literature on autobiographical memory. If we consider autobiographical memory as “memory for the events of one’s life” (Conway & Rubin, 1993; see the Self-Memory System (SMS); Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004), we could consider NDE memories as part of this memory system. The literature has shown that intensity of an experience affects the properties of the subsequent autobiographical memories more so than do valence or the age of the memory (e.g. Holmes, 1970; Talarico, LaBar, & Rubin, 2004). Highly intense events are firmly anchored and remembered in memory (Bradley, 1994) and this is partly due to associated emotions. In the literature certain models suggest that the effects of emotion on memory could be explained without suggesting specific mechanisms associated with the emotional arousal (e.g. Bradley, 1994). From that perspective, the enhanced memory observed for emotional events might be due to “ordinary” factors (e.g. enhanced attention and/or increased elaboration) –as is the case with non-emotional events. In contrast, other models do suggest the existence of some additional special mechanisms associated with emotional arousal (e.g. McGaugh, 2000). Neural and hormonal mechanisms specific to emotional stimuli might influence their memory encoding (e.g. notably because of release of hormones; Cahill & McGaugh, 1998; McGaugh, 2000), leading to more elaborated memory representations (Bradley, 1994). Since NDEs are known to imply a great emotional involvement (generally positive in valence) and to be high intensity (Moody, 1975), we can easily suggest that NDE memories can then benefit from a special encoding and storage (e.g. strong consolidation) that make them more phenomenologically detailed and more persistent than other kinds of memories. From the experiencers’ perspective, NDE memories are characterized by a sense of “phenomenological certainty” (Dell’Olio, 2010). Recently, Thonnard et al. (2013) investigated NDE memories using the Memory Characteristics Questionnaire (MCQ; Johnson, Foley, Suengas, & Raye, 1988) built to analyze phenomenological characteristics of real and imagined memories, and showed that NDE memories –as defined by the Greyson NDE scale (i.e. total score $\geq 7/32$; Greyson, 1983)– contain more phenomenological characteristics (e.g. emotions, contextual and sensory information) than imagined, real event and coma memories. This study suggests that NDEs cannot be considered as imagined event memories but rather a sort of “hyper reality” and seem unrivalled memories. Moreover, Greyson (2007) has shown that reports of NDEs have not changed over time, in assessing reported second accounts 20 years after the original one. Therefore, NDE memories seem to have very rich phenomenological characteristics and are stable over time. From a neurological perspective, NDE memories have been investigated in only very few studies. Nonetheless, Palmieri et al. (2014) have replicated Thonnard et al.’ (2013)’ findings and have further shown using electroencephalography (EEG) recordings that, at a neural level, NDE memories are stored as “episodic memories of events experienced in a peculiar state of consciousness” –and not as imagined event memories. More generally, the crucial question remains as to where and how the brain can store this experience (Agrillo, 2011).

Surely, other influencing factors can intervene in the creation of an exceptionally clear memory trace. As the term itself suggests, NDEs typically occur in situations in which people are close to death or are perceived as such. This context might strengthen the intensity of what they perceived and also makes the event “threatening” for individuals, independently of the associated positive feelings. Through evolution, human memory has developed the ability to preferentially retain events that are relevant for survival. Indeed, it would be adaptive to integrate relevant information on adverse events to be prepared for them in the future (see Porter & Peace, 2007). However, regarding the memory characterization, it seems that it is the perception of the experience that is relevant, and not being “near-death” as coma memories include less phenomenological characteristics than NDE memories (Thonnard et al., 2013). Furthermore, NDEs seem to be (at least in part) due to physiological mechanisms, because NDErs really perceived the experience while we do not have any certainty that there are associated and appropriate stimulus existing in reality (Braithwaite, 2008). Indeed, it seems that NDEs have physiological origins –for example, OBEs caused by an impairment of temporo-parietal area structure (Blanke & Arzy, 2005; Blanke, Landis, Spinelli, & Seeck, 2004). Finally, to face with those potentially dangerous situations, humans can develop various adaptive mental and physical responses, including dissociation. Psychological theories have proposed that NDEs are dissociative states in which individuals experience a dissociation of the self-identity from bodily sensations (Irwin, 1993), leading them to experience pleasurable dimensions and sensations instead of the unpleasant event itself (Pfister, 1930). As a support to this view, Greyson (2000b) suggested that NDEs are probably more compatible with a normal response to stress than a pathological disorder. We can then consider NDEs as an integral part of an adaptive response to physical or emotional danger.

In psychological science, subjective self-report scales and questionnaires have been developed to collect data on many subjective states and contents of consciousness. However, while a growing number of such scales have been published on several different topics, there are only a very limited number of scales developed to collect data about NDEs specifically. To date, the most widely used standardized tool to identify NDEs in research is the Greyson NDE scale (Greyson, 1983). This scale provides a cut-off score (i.e. total score $\geq 7/32$; Greyson, 1983) permitting a standardized identification of NDErs. The Greyson NDE scale reflects the intensity of the NDE since it considers the amount of ticked experienced dimensions (i.e. 0 = “not present” or presence of the item) and the gradation of intensity in provided scoring (i.e. 1 = “mildly or ambiguously present,” and 2 = “definitively present”). Therefore, according to the scale, the Greyson NDE scale total score (out of total possible 32 points) reflects the NDE overall intensity (Greyson, 1983; Lange, Greyson, & Houran, 2004). Few other authors have undertaken the considerable challenge of designing scales to assess NDEs and only two other scales have been proposed: The Weighted Core Experience Index (WCEI; Ring, 1980) and a short version of the 16-item Greyson NDE scale (Greyson, 1983) called The Near-Death Experience Scale-6 scale (NDE-6; Prosnick & Evans, 2003). However, Ring’s WCEI was neither based on statistical analyses nor tested for coherence or reliability. Although Greyson’s construction of the Greyson NDE scale has subsequently addressed these limitations, it seems that, in general, we remain rather limited to investigate this

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