

# Persistence of Attitude Changes After Near-Death Experiences

## *Do They Fade Over Time?*

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**Abstract:** The aim of this study was to compare attitude changes reported by people who described near-death experiences (NDEs) at two periods two decades apart, to ascertain whether the attitude changes persisted over time. Participants completed the Life Changes Inventory (LCI) upon entry into the study and again two decades later, and the NDE Scale to quantify depth of the experience. Sixty-three participants (mean age at entry into study,  $46 \pm 10$  years) had scores on the NDE Scale typical of other near-death experiencers. Scores on the LCI showed significant changes in attitudes toward life and death both on entry into the study and two decades later. LCI scores showed no significant change over that period, nor was there a significant correlation between change in LCI scores and time elapsed between the two administrations. NDEs appear to be unusual in the long-term persistence of attitude changes.

**Key Words:** Near-death experiences, attitude change, attitude to death, attitude to life

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Profound subjective experiences that are reported after a close brush with death have been described in the annals of ancient Egypt, Mesopotamia, India, Greece, Rome, China, Tibet, and Meso-America, and have been reported in medical literature since the mid-18th century (Charlier, 2014; Du Monchaux, 1766). Toward the end of the 19th century, a collection of cases was published, identifying them as a discrete phenomenon (Heim, 1892), and a few years later, they were labeled *expériences de mort imminente* in the French literature (Egger, 1896). This phenomenon, called in English near-death experiences (NDEs) (Moody, 1975), has been researched more extensively in recent decades (Sleutjes et al., 2014). Common elements of NDEs include highly emotional features such as seeing a bright light, feelings of overwhelming peace and a sense of harmony or unity, heightened senses, a sensation of being out of the body, altered time perception, and a panoramic life review (Greyson, 1983a; Moody, 1975).

Recent research suggests that NDEs are reported by 10% to 18% of cardiac arrest survivors (Greyson, 2003; Parnia et al., 2001; van Lommel et al., 2001), that they are consistent with a nonspecific physiological response to stress and not symptomatic of a pathological disorder (Greyson, 2000, 2001), and that their phenomenology is independent of prevailing cultural models (Athappilly et al., 2006). The underlying mechanisms and triggers of NDEs are unknown, but tentative theories have been proposed attributing such experiences to

physiological mechanisms (Rodin, 1980; Steinmeijer, 1996), to psychological mechanisms (Greyson, 1983b), and to sociohistorical factors (Kellehear, 1993). Despite questions about their etiology, NDEs are important to clinicians and neuroscientists for two reasons. First, they may be mistaken for psychopathological states, yet have profoundly different sequelae requiring different therapeutic approaches (Greyson, 1997, 2001), and they may provide comfort, dignity, and reassurance to people who are terminally ill or bereaved (Martens, 1994). Second, clarification of their mechanisms may enhance our understanding of consciousness and its relation to brain function (Khanna et al., 2018; Morse and Neppe, 1991); neuroimaging of near-death experiencers meditating on their NDEs have identified areas of marked hemodynamic and neuroelectric changes in specific brain regions (Beauregard et al., 2009).

Retrospective assessments by near-death experiencers themselves and by their significant others describe NDEs as life-transforming, leading to profound changes in attitudes, beliefs, and behaviors (Khanna and Greyson, 2015; Noyes et al., 2009; Parnia et al., 2007). Although accounts of profound personality changes after NDEs have been reported since the mid-19th century (Brodie, 1865), the first quantitative measure of life changes after NDEs was the Life Changes Inventory (LCI) developed by Ring in the early 1980s. The first published reference to the LCI was by Flynn (1982), who reported the scores of 21 near-death experiencers on 20 items from “a questionnaire administered by Kenneth Ring” (p. 6). Although he did not perform any statistical analysis on these scores, Flynn reported that the near-death experiencers described increased concern for others, lessened fear of death, increased belief in an afterlife, increased religiosity, and decreased desire for material success and approval of others. Ring himself published his first account of the LCI shortly thereafter, presenting the responses of 26 near-death experiencers, although again without any statistical analysis because he felt his small, self-selected sample was unlikely to be representative (Ring, 1984).

In the decades since the LCI was published, it has been the most widely used instrument for measuring changes in attitudes and values after NDEs (Greyson and Ring, 2004). Over the years, various versions of the LCI have been used by a number of researchers with between 42 and 50 items, to document attitude changes after not only NDEs but also a range of other spiritual or transformative experiences (Greyson and Ring, 2004).

Despite the literature documenting pervasive and long-lasting attitude changes after NDEs, some authors have questioned the evidence for persistence over time of such aftereffects (Marsh, 2016; Smith, 2015). The only prior longitudinal study of attitude changes in a cohort of near-death experiencers was that of van Lommel et al. (2001), who followed 23 patients who reported NDEs after cardiac arrest for a period of 8 years. They reported that arrest survivors who had NDEs described statistically greater attitude changes than did survivors who did not have NDEs on 13 of the items on the LCI, and noted that positive changes were more apparent after 8 years than after 2 years, but they did not report statistical analysis of the changes in attitude between years 2 and 8. The present study was an attempt to assess the persistence of attitude changes after NDEs using statistical analysis of scores on the LCI administered to the same cohort on two occasions about 20 years apart.

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Ethics review: This study was conducted according to acceptable research standards, including having obtained written informed consent of study participants. This work was approved by the University of Virginia Institutional Review Board for the Social and Behavioral Sciences (institutional approval reference number 1999-0116-00).

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## METHODS

### Study Design and Participants

In the 1980s, I collected accounts of NDEs from more than a hundred individuals who had contacted me to share their narratives, as described elsewhere (Greyson, 1983a). Each person in that volunteer sample cohort completed a questionnaire about his or her NDE and its aftereffects, including the LCI. Starting in 2003, I attempted to locate the participants in the original cohort at their last known address and sought more current addresses through organizational membership lists, personal contacts, and internet search engines. I was able to locate 63 respondents who had completed the LCI in the 1980s, and mailed or e-mailed them each a second copy of the LCI, without mentioning the first administration of that instrument 20 years earlier. The 63 original set of responses on the LCI were completed between 1982 and 1989, with a mean completion date of 1985 (hereafter designated  $t_1$ ). The 63 second set of responses were completed between 2003 and 2016, with a mean completion date of 2007 (hereafter designated  $t_2$ ).

### Measures

The NDE Scale is a 16-item Likert-type questionnaire developed specifically to identify and quantify NDEs (Greyson, 1983a). The scale includes items regarding changes in cognitive processes (four items, such as accelerated thought processes and distortions in the sense of time), changes in affective processes (four items, such as intense feelings of peace and joy), purportedly paranormal processes (four items, such as a sense of leaving the physical body and being aware of events at a distance from the body), and experience of transcendence (four items, such as purported encounters with divine entities and with some other realm or dimension of existence). The NDE Scale has high internal consistency, split-half reliability, and test-retest reliability over a 6-month period (Greyson, 1983a) and over a 20-year period (Greyson, 2007), and differentiates close brushes with death with and without NDEs (Greyson, 1990). A Rasch rating scale analysis established that it yields a unidimensional measure with interval-scaling properties (Lange et al., 2004).

In addition to scoring each NDE on the NDE Scale, each experience was categorized by circumstances of the close brush with death and by medical severity of the event. Circumstances were classified as a) medical illness, b) surgical complication, c) accident (e.g., fall, drowning, electrocution), or d) other (e.g., military combat, assault, suicide attempt). Medical severity was classified as either a) loss of vital signs or pronouncement of death or b) no loss of vital signs or pronouncement of death.

The LCI is a Likert-type questionnaire developed specifically to quantify attitude changes after NDEs (Ring, 1984). I used the 44-item version of the LCI that was most commonly used at the time of the original administration on the scale in the 1980s. Each item is prefaced by the qualifier “Since my NDE...” followed by the item itself, which respondents are asked to rate on a 5-point Likert scale ranging from +2 (strongly increased) to -2 (strongly decreased), indicating whether and to what degree they felt their attitudes had changed since their NDE. The items were grouped into nine personal value domains:

- (1) appreciation of life (4 items, such as “...my appreciation for the ‘ordinary things in life’ has...”),
- (2) self-acceptance (3 items, such as “...my feelings of self-worth have...”),
- (3) concern for others (10 items, such as “...my desire to help others has...”),
- (4) concern with worldly achievement (7 items, such as “...my competitive tendencies have...”),
- (5) concern with social or planetary issues (5 items, such as “...my concern with questions of social justice has...”),
- (6) quest for meaning and sense of purpose (4 items, such as “...my search for personal meaning has...”),

- (7) spirituality (5 items, such as “...my concern with spiritual matters has...”),
- (8) religiousness (4 items, such as “...my interest in organized religion has...”), and
- (9) appreciation of death (3 items, such as “...my fear of death has... [scored negatively]).

Mean scores are reported for each of the nine personal value domains. In addition, an absolute change score is reported as the mean of the absolute values of the 44 individual items, to reflect the global effect of the NDE.

### Data Analysis

Two-tailed paired-samples *t*-tests were used to compare LCI scores on the first and second administrations. Two-tailed paired-samples Pearson correlation coefficients were used to assess both the reliability of LCI items over time and the association between LCI score changes and time elapsed between the two administrations. Pearson correlation coefficients were also used to assess the association between NDE Scale scores and LCI scores at  $t_1$  and  $t_2$  and between NDE Scale scores and LCI change scores. One-way analyses of variance were used to assess the association between circumstances of the near-death event and NDE Scale scores and between circumstances of the event and change in LCI scores. Two-tailed independent-samples *t*-tests were used to assess the association between medical severity and NDE Scale scores and between medical severity and change on LCI scores. IBM SPSS Version 28.0 was used to perform all analyses.

## RESULTS

### LCI Scores Over Time

The mean age of the 63 participants was 46.4 years (SD, 9.6) at the time of the first administration of the LCI ( $t_1$ ) and 66.8 years (SD, 9.6) at the time of the second ( $t_2$ ). The mean time elapsed since the NDE was 17.7 years (SD, 12.4) at the time of the first administration and 38.0 years (SD, 13.1) at the time of the second. The mean time that had elapsed between the two administrations of the LCI was 20.5 years (SD, 7.3), with a range from 14 to 33 years. Cronbach's  $\alpha$  for the LCI in this sample was .81, indicating high relatedness among the item responses.

Table 1 presents the mean LCI scores on the first and second administration for the nine personal value domains and for the absolute change score, where scores ranged from +2 for strongly increased to -2 for strongly decreased. Scores were highest (on both first and second administrations of the LCI) for the personal value domain of appreciation for death, followed by appreciation for life, spirituality, concern for others, quest for meaning/sense of purpose, self-acceptance, religiosity, and concern for social or planetary issues; the only domain that showed a negative change after the NDE was concern for worldly achievement.

Table 1 also presents the two-tailed paired-samples *t*-tests that were used to compare LCI scores on the first and second administrations, which did not reveal statistically significant differences on the absolute change score or on any of the nine personal value domains, when corrected for multiple simultaneous tests by the Bonferroni procedure. Between the first and second administrations, after a 20-year lapse of time, the absolute change score declined nonsignificantly (0.04 point). Scores on the domain of concern for social or planetary issues showed the greatest increase (0.27 point) during that period, followed by appreciation for death (0.12 point), quest for meaning and sense of purpose (0.11 point), spirituality (0.08 point), concern for worldly achievement (0.07 point), self-acceptance (0.06 point), and appreciation for life (0.03 point), whereas scores on the domain of religiosity showed the greatest decrease (-0.28 point), followed by concern for others (-0.01 point).

Table 1 also presents the two-tailed paired-samples Pearson correlation coefficients between the two administrations of the LCI ( $r_{\text{scores}}$ ). The test-retest reliability over the two-decade period was highly

**TABLE 1.** LCI Scores on First and Second Administrations

Item	t <sub>1</sub> Score	t <sub>2</sub> Score	t (df = 62)	r <sub>scores</sub>	r <sub>time</sub>
Appreciation for life	1.31 ± 0.58	1.34 ± 0.63	0.43	0.46*	-0.03
Self-acceptance	1.05 ± 0.77	1.11 ± 0.64	0.71	0.50*	0.01
Concern for others	1.18 ± 0.54	1.17 ± 0.64	-0.09	0.65*	0.03
Concern for worldly achievement	-0.50 ± 0.72	-0.43 ± 0.75	0.75	0.47*	0.05
Concern for social/planetary issues	0.26 ± 0.90	0.53 ± 0.76	0.46	0.43	-0.17
Quest for meaning/purpose	1.16 ± 0.63	1.27 ± 0.64	1.39	0.54*	0.05
Spirituality	1.28 ± 0.66	1.36 ± 0.62	1.17	0.65*	0.23
Religiosity	0.67 ± 0.86	0.39 ± 0.88	-2.41	0.45*	0.13
Appreciation for death	1.32 ± 0.65	1.44 ± 0.62	2.07	0.75*	-0.09
Absolute change	1.14 ± 0.44	1.10 ± 0.47	-0.83	0.71*	0.03

\*Significant at  $p \leq 0.01$ .

significant ( $p < 0.001$ ) for the absolute change score and for each of the nine personal value domains except for concern for social or planetary issues, which was not significant when corrected for multiple simultaneous tests by the Bonferroni procedure.

Finally, Table 1 presents the Pearson correlation coefficients between changes in LCI scores between the first and second administrations and time elapsed between the two administrations ( $r_{time}$ ). Change in the absolute change score was not significantly correlated with the elapsed time interval, nor were changes on any of the nine personal value domains.

**NDE Characteristics and LCI Scores**

The mean NDE Scale score of the 63 participants was 15.9 (SD, 6.7) out of a possible 32 points, typical of other samples of near-death experiencers (Greyson, 1983a). Circumstances precipitating the NDE were not significantly associated with NDE Scale scores ( $F = 0.78$ ;  $df = 3, 60$ ). Medical severity of the near-death event was significantly associated with NDE Scale scores, with those who experienced loss of vital signs or were pronounced dead having a mean NDE Scale score of 18.6 (SD, 8.0), whereas those who did not had a mean NDE Scale score of 14.5 (SD, 5.6) ( $t = 2.30$ ;  $df = 61$ ;  $p = 0.025$ , with Cohen's  $d = 6.53$ , indicating a medium effect).

Table 2 presents the Pearson correlation coefficients between NDE Scale scores at each participant's entry into the study and LCI scores both at that time and two decades later. On the first administration of the LCI, NDE Scale scores were significantly correlated with scores on the LCI absolute change score ( $r = 0.47$ ,  $p < 0.001$ ), as well as with scores on the value domains of appreciation for death, spirituality, appreciation for life, quest for meaning/sense of purpose, and concern for others. NDE Scale scores were not significantly associated with scores on the domain values of self-acceptance, concern for worldly achievement, concern for social or planetary issues, or religiosity.

On the second administration of the LCI, NDE Scale scores were still significantly correlated with scores on the LCI absolute change score ( $r = 0.50$ ,  $p < 0.001$ ), as well as with scores on the value domains of appreciation for death, spirituality, appreciation for life, quest for meaning/sense of purpose, concern for others, and self-acceptance. NDE Scale scores were still not significantly associated with scores on the domain values of concern social or planetary issues or religiosity, but this time, they were negatively correlated with score on the domain value of concern for worldly achievement. That is, the higher the score on the NDE Scale, the greater the decrease over time in concern for worldly achievement. As shown in Table 2, NDE Scale scores were not significantly correlated with any changes in LCI scores over time.

The circumstances precipitating the NDEs were medical illness in 17 cases (27%), surgical complications in 28 cases (41%), accidents in 11 cases (18%), and other circumstances in 9 cases (14%). Precipitating circumstance was not significantly associated with change in LCI scores between the first and second administrations ( $F = 0.21$ ;  $df = 3.59$ ).

Medical severity of the near-death event involved loss of vital signs or pronouncement of death in 21 cases (33%). Medical severity was not significantly associated with change in LCI scores between the first and second administrations ( $t = 0.48$ ;  $df = 61$ ).

**DISCUSSION**

This study documents the persistence of attitude changes over a period of two decades after NDEs. Respondents reported increases after their NDEs in their appreciation for death, appreciation for life, spirituality, concern for others, quest for meaning or sense of purpose, self-acceptance, religiosity, and concern for social or planetary issues, and decreases in their concern for worldly achievement.

Scores on the LCI administered in the 1980s and again to the same individuals an average of 20.5 years later showed no statistical differences. Scores were statistically unchanged over this two-decade period on the absolute change score and on each of its nine personal value domains, contradicting speculations that attitude changes after NDEs might fade over time. In addition, the test-retest reliability was highly

**TABLE 2.** Correlation of NDE Scale Scores and LCI Scores

Item	r <sub>t-1 score</sub>	r <sub>t-2 score</sub>	r <sub>change</sub>
Appreciation for life	0.46*	0.48*	0.07
Self-acceptance	0.28	0.40*	0.08
Concern for others	0.31*	0.42*	0.21
Concern for worldly achievement	-0.23	-0.40*	-0.20
Concern for social/planetary issues	-0.08	0.02	0.01
Quest for meaning/purpose	0.35*	0.36*	0.02
Spirituality	0.49*	0.59*	0.10
Religiosity	0.23	0.09	-0.11
Appreciation for death	0.53*	0.56*	0.02
Absolute change	0.47*	0.56*	0.15

\*Significant at  $p \leq 0.01$ .

significant for the absolute change score and for all the personal value domains with the single exception of concern for social or planetary issues. However, doubt has been raised previously about the statistical reliability of that particular domain. In a psychometric analysis of the LCI after combat-related NDEs, Goza et al. (2014) found that for concern for social or planetary issues, Cronbach's  $\alpha$  was below the acceptable level (0.6) for a reliable cluster.

Furthermore, changes in LCI scores were not significantly correlated with the elapsed time interval between the two administrations of the instrument. Depth of the NDE as measured by the NDE Scale score upon the first administration of the LCI was significantly correlated with the absolute change score and with six of the nine value domains. NDE Scale scores were not associated with any change in LCI scores with one exception: initial NDE Scale scores were associated with a decrease over time in concern for worldly achievement. Although some decrease in that value domain might be expected with aging, that expectation would not explain why that effect was stronger in individuals with higher scores in the NDE Scale.

The lack of a significant association between LCI score changes over time and either precipitating circumstances of the NDE or medical severity of the near-death event suggests that different precipitating pathological conditions did not affect attitude changes or memory of attitudes differentially.

This was the first study to assess the persistence of attitude changes after NDEs using statistical analysis of a quantitative measure. The findings corroborate previous reports that have shown no diminution in attitude changes with the passage of time after NDEs. Most of those earlier studies were cross-sectional studies comparing individual cases that had been collected at differing time intervals after the occurrence of the NDE. As noted above, the only prior longitudinal study of attitude changes in a cohort of near-death experiencers was that of van Lommel et al. (2001), who found that positive changes were more apparent 8 years after the NDE than 2 years after the event, but did not report statistical analysis of the changes in attitude between years 2 and 8.

The conclusions of this study are limited by its reliance on participants' reports of their attitude changes, and not on observable behavioral changes or corroboration by their significant others. Furthermore, we cannot know how representative this sample was of all near-death experiencers. These participants had not been exposed to the LCI during the two decades between the first and second administrations. It is of course possible that some of these respondents had reviewed their responses in the interim. However, not a single participant expressed any recognition, when sent the LCI a second time, that he or she had completed that same questionnaire many years ago.

## CONCLUSIONS

These findings suggest that attitude changes do not diminish over decades after an NDE. This evidence that reports of attitude changes after NDEs are persistent over a period of two decades supports the validity of studies of such attitude changes that had occurred years before their investigation. NDEs appear to be unusual in this profound long-term transformation of attitudes and values. Additional study may elucidate what particular features of NDEs may contribute to this remarkable effect. Further exploration of attitude changes after NDEs may help us understand persistent psychological responses to other kinds of extreme experiences or life threats.

## DISCLOSURE

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