



Religious and Spiritual Aspects of Disaster Experience Among Survivors of the 9/11 Attacks on New York City's World Trade Center

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Abstract

This study examined religious and spiritual aspects of disaster experience among 379 survivors of the 9/11 attacks on New York City's World Trade Center. Interviews conducted 35 months after the disaster provided structured diagnostic assessments of psychiatric disorders and specific detail of demographic characteristics, experience of the disaster, and variables related to religion and spirituality. The study participants overwhelmingly identified with a specific religion. The disaster appeared to have only modest effects on strength and importance of religion/spirituality, and changes were predominantly positive. Specific religions and faith groups differed in their disaster experience in important ways.

Keywords Religion · Coping · Disaster · 9/11 attacks

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Introduction

Eighty percent of Americans identify themselves as religious or spiritual (Pew Research Center 2015) but do not necessarily categorize themselves into formal membership in religious denominational groups. More Americans state that they are religious or spiritual during times of decline in religious denominational membership (Pew Research Center 2014; Lipka and Gecewicz 2017). Consequently, religiosity and spirituality are becoming distinct and separate from denominational membership.

Religiosity and spirituality have long provided a means to cope with personal and community-wide tragic events (Ano and Vasconcelles 2005). Religious and spiritual forms of coping include prayers and personal meditation, readings of sacred scriptures or texts, engaging in individual or communal worship, and rituals reaffirming the purpose of life. It would thus not be unexpected that many New Yorkers coped with the September 11, 2001 (9/11), terrorist attacks through means of religion and spirituality. A large representative national survey after 9/11 (Schuster et al. 2001) found that 90% used religion to cope and 44% used religion to cope “quite a lot.”

A major review of the religion as coping literature (Pargament 1997) found that religious coping was associated with good mental health outcomes, specifically “positive” religious coping that conceptualizes a higher power as nurturing rather than condemning. Across the studies in this review, spirituality and a strong relationship with God were consistent predictors of optimism in the face of trauma or adversity. A national mailed survey of Presbyterian ministers found that looking to God for strength and support was the most frequent religious coping response to 9/11 and increased prayer was second (Meisenhelder and Marcum 2004). More positive religious coping was negatively correlated with stress, avoidance, and numbing responses. In examining the effect of negative religious coping in the context of 176 terminally ill patients, religious people who felt abandoned by God were at greater risk of death within 2 years (Pargament et al. 2001).

Although the global association between positive religious coping and mental health outcomes is relatively well established in the literature, other aspects of religion and spirituality in the experience of disaster have not been well examined. Therefore, the current study examined data on religious and spiritual aspects of disaster experience among 379 survivors of the 9/11 attacks on New York City’s World Trade Center.

Methods

Previous publications from this study provide extensive detail of the methods, the sample, and their 9/11 trauma exposures (North et al. 2011, 2013, 2015). The data were collected 35 months after the 9/11 attacks from a volunteer sample of 379

study participants recruited through information distributed at the workplace. The sample included from 176 participants from three agencies housed in the WTC towers (one agency located above the strike zone with many employee casualties and two agencies located below the strike zone) and 203 from five other agencies in the geographical area (a social service agency within two blocks of the WTC that sustained structural damage to its building, an airline company with a direct view of the WTC several miles away, an investor-owned energy utility company with personnel providing immediate assistance to the scene, and 2 nonprofit agencies providing disaster support services). The institutional review boards of the collaborating academic institutions for this study approved the project, and all participants provided informed consent prior to participation.

Structured interviews were administered by mental health professionals formally trained on these interviews: the Diagnostic Interview Schedule for *DSM-IV* (DIS-IV) (Robins et al. 2000) and Disaster Supplement (North et al. 2001). Demographic data were obtained through the combination of these two instruments. The Disaster Supplement collected detailed information about disaster trauma exposures in the 9/11 attacks, and the PTSD section of the DIS assessed qualifying types of 9/11 trauma exposure according *DSM-IV* criteria for PTSD (American Psychiatric Association 2000). Onset and recency data relative to the September 11, 2001, permitted assessment of lifetime predisaster disorders and postdisaster disorders. The Disaster Supplement obtained specific information about religion and spirituality (see Table 1). First, participants provided their religious affiliations, grouped into major religious categories. Participants were also asked how often they attended religious services and whether their attendance changed (increased, decreased, no change) after the 9/11 attacks, how important is religion/spirituality to the individual currently and just before the 9/11 attacks, whether the 9/11 attacks changed their religious or spiritual beliefs (strengthened, weakened, no effect), and how they coped with the attacks including religious/spiritual coping. In addition, their spiritual and religious resources, participants were asked whether they sought assistance from mental health professionals or used alcohol to cope.

Statistical analysis was conducted using SAS 9.4 (SAS Institute, Cary, NC). Descriptive findings are presented with raw numbers and proportions for categorical variables and with means with standard deviations (SD) for numerical variables. Categorical variables were compared using two-sided χ^2 analyses, substituting Fisher's exact tests in instances of expected cell sizes < 5 . Categorical and numeric variables were compared with *t* tests, substituting Satterthwaite tests for pooled analysis in cases of unequal variance determined by Levene's test. Statistical significance was set at $\alpha \leq .05$.

Results

The sample ($N=379$) was 47% male, a median of 44 years of age, 71% white, 67% college educated, and 51% currently married. Approximately one-fourth (27%, $n=102$) were directly exposed to physical danger in the 9/11 attacks, including 62 individuals who were in the towers and another 17 immediately outside the towers

Table 1 Religious characteristics of the sample

	% (n/N)
Religious preference	
Christian	62 (233/373)
Catholic	39 (146/373)
Protestant	16 (59/373)
Other Christian	8 (28/373)
Jewish	14 (54/373)
Muslim	1 (3/373)
Hindu	1 (3/373)
Buddhist	1 (5/373)
Other ^a	7 (27/373)
None/atheist	13 (48/373)
How often do you attend religious services?	
More than once a week	7 (24/373)
Once a week	22 (71/373)
Less than weekly but on days other than holidays	22 (70/373)
Only on holidays	18 (58/373)
Never or almost never	31 (101/373)
Change in religious service attendance frequency since 9/11	
No change	73 (273/326)
Increased	18 (58/326)
Decreased	10 (31/326)
How important is spirituality/religion to your life now	
Very	45 (197/372)
Some	29 (108/372)
A little	14 (51/372)
Not at all	12 (46/372)
How important was spirituality/religion to your life just before 9/11	
Very	36 (133/372)
Some	31 (117/372)
A little	18 (66/372)
Not at all	15 (56/372)
Did 9/11 affected your spiritual/religious beliefs?	
No	60 (225/372)
Yes, strengthened	30 (112/372)
Yes, weakened	5 (18/372)
Yes, other	5 (17/372)
Coped with the 9/11 disaster through spirituality/religion	
No	55 (207/376)
Yes	45 (112/376)

^aIncludes Unitarian Universalist, interfaith/universal, B'Ahai, Eckankar, and Pagan

during the attacks. PTSD was diagnosed in 35% (36/102) of those directly exposed. Table 1 lists the religious characteristics of the sample. Nearly two-thirds of the sample was Christian and the majority of Christians were Catholic. More than 10% of the sample reported Jewish affiliation and more than 10% reported no religious affiliation.

Nearly one-third of the sample reported frequency of religious service attendance as never or almost never, but more than one-fourth (29%) reported weekly or more frequent attendance. Fewer than one-fourth of the sample reported a change in frequency of service attendance since 9/11, and more individuals had an increase than a decrease in frequency. More than half of the sample reported that they coped with the disaster through religion or spirituality.

Almost no one—only 3.0% (11/372) of the sample—reported having generated new importance of religion/spirituality after the disaster that was not present before, and this gain was approximately 10 times more common than total loss of religious/spiritual importance (.3% of the sample, 1/372). Of the 15% ($n = 56$) who stated that religion/spirituality was not at all important to them before the disaster, only 20% ($n = 11/56$) reported that religion/spirituality had at least some importance to them after the disaster, compared to <1% ($n = 1/316$) of those reported some importance of religion/spirituality before the disaster (McNemar $S = 8.33$, $df 1$, $p = .004$). Less than half of the sample indicated that the 9/11 disaster affected their religious or spiritual beliefs. Nearly one-third of the sample reported a strengthening of their religious or spiritual beliefs after the disaster, and this experience was six times more common than weakening of religious or spiritual beliefs after the disaster (30% vs. 5%; $\chi^2 = 67.97$, $df 1$, $p < .011$).

Portraits of Religious Groups

As a group, people reporting Christian affiliations were more likely than people reporting other religious preferences to be Black (20% vs. 7%; $\chi^2 = 11.52$, $df 1$, $p < .001$) and Hispanic (10% vs. 4%; $\chi^2 = 5.54$, $df 1$, $p = .186$) and less likely to be Asian (2% vs. 10%; $\chi^2 = 13.04$, $df 1$, $p < .001$) or college educated (56% vs. 86%; $\chi^2 = 34.45$, $df 1$, $p < .001$). Additionally, people reporting Christian affiliations were more likely to feel that religion was important to them both before the disaster (73% vs. 57%; $\chi^2 = 10.01$, $df 1$, $p = .002$) and now (73% vs. 55%; $\chi^2 = 13.09$, $df 1$, $p < .001$) and to cope with the disaster through religion (56% vs. 27%; $\chi^2 = 29.96$, $df 1$, $p < .001$), to feel the disaster had caused them a great deal of harm (74% vs. 63% $\chi^2 = 5.60$, $df 1$, $p = .008$), and to develop disaster-related PTSD (17% vs. 9% $\chi^2 = 4.46$, $df 1$, $p = .035$) or incident generalized anxiety disorder (4% vs. 0%; Fisher's exact $p = .016$).

Comparing Catholic to non-Catholic Christian affiliations, those with Catholic affiliations were more likely to be married (60% vs. 45%; $\chi^2 = 4.78$, $df 1$, $p = .029$). They were also more likely to have had any disaster trauma exposure as defined by *DSM-IV* criteria for PTSD (55% vs. 32%; $\chi^2 = 12.08$, $df 1$, $p < .001$), have been in one of the WTC towers on 9/11 (25% vs. 10%; $\chi^2 = 7.72$, $df 1$, $p = .007$), and feel very upset now (46% vs. 24%; $\chi^2 = 11.34$, $df 1$, $p = .001$).

As a group, people reporting Jewish affiliations were more likely than those with other religious preferences to be older (mean = 51.7, SD 11.7 vs. mean = 44.1, SD 10.6; $t = 4.71$, df 370, $p < .001$), college educated (89% vs. 64%; $\chi^2 = 13.03$, df 1, $p < .001$), and married (65% vs. 50%; $\chi^2 = 4.32$, df 1, $p = .038$) and less likely to be Hispanic (0% vs. 9%; Fisher's exact $p = .013$) or Black (0% vs. 18%; $\chi^2 = 11.51$, df 1, $p = .001$). They were also less likely to have indirect exposure though disaster trauma experienced by a close associate (0% vs. 8%; Fisher's exact $p = .034$), but more likely to have seen people falling from the towers (26% vs. 13%; $\chi^2 = 6.68$, df 1, $p < .010$) or to have been endangered by the planes hitting the towers (26% vs. 14%; $\chi^2 = 5.18$, df 1, $p < .023$). They were also less likely to attend religious services at least once a week (6% vs. 21%; $\chi^2 = 10.46$, df 1, $p = .001$) and to have considered religion important before 9/11 (5% vs. 20% $\chi^2 = 14.1$ df 1 $p < .001$) and now (8% vs. 20%; $\chi^2 = 9.05$, df 1, $p = .003$).

Those who selected Muslim as a religious affiliation were more likely to be older (mean = 49.7, SD 1.5 vs. mean = 45.2, SD 11.1; $t = 4.3$, df 4.1, $p = .012$). Although there were only three people reporting Muslim affiliations in the sample, all three said they were very upset about the disaster now (100% vs. 36%; Fisher's exact $p = .047$). Four out of the five people reporting Buddhist affiliations in the sample did not feel harmed a great deal by the 9/11 attack (20% vs. 71%; Fisher's exact, $p = .030$).

Those who selected none as a religious preference were more likely than all the others to be younger (mean = 41.7, SD 10.2 vs. mean = 45.7, SD 11.2; $t = 2.34$, df 370, $p = .020$), Asian (17% vs. 3%; Fisher's exact $p < .001$), college educated (92% vs. 63%; $\chi^2 = 15.06$, df 1, $p < .001$), and less likely to be Hispanic (0% vs. 9%; Fisher's exact $p = .036$) or married (31% vs. 55%; $\chi^2 = 9.27$, df 1, $p = .002$). They were more likely to have fled from a collapsing building (21% vs. 11%; $\chi^2 = 3.99$, df 1, $p = .046$). Additionally, they were less likely to feel harmed a great deal (50% vs. 73%; $\chi^2 = 10.60$, df 1, $p < .001$) by the disaster and to cope through religion (2% vs. 51%; $\chi^2 = 40.83$, df 1, $p < .001$).

Associations with Religious Variables

Demographics

Attendance at religious services at least once a week was negatively associated with White race (25% vs. 40%; $\chi^2 = 7.61$, df 1, $p = .006$), but not with any other demographic variable. Change in frequency of attendance at religious services was not associated with any demographic variable. Reporting that religion or spirituality in daily life is currently "very important" was positively associated with female sex (36% vs. 53%; $\chi^2 = 11.33$, df 1, $p < .001$). Among women only, the difference in proportions reporting that religion or spirituality in daily life was very important before vs. after the 9/11 attacks was significantly higher after the attacks (53% vs. 38%; McNemar $S = 12.13$, df 1, $p < .001$). Reporting that religion or spirituality in daily life was very important was positively associated with Black (79% vs. 38%; $\chi^2 = 32.50$, df 1, $p < .001$) and (69% vs. 42%; $\chi^2 = 7.66$, df 1, $p = .006$) (35% vs. 69%;

$\chi^2=35.93$, df 1, $p < .001$). The proportions reporting differences in importance of religion or spirituality in daily life before vs. after the 9/11 attacks were significantly higher after the attacks for both White (28% vs. 35%; McNemar $S=11.56$, df 1, $p < .001$) and Black (58% vs. 79%; McNemar $S=12.00$, df 1, $p < .001$) races. Reporting that religion or spirituality in daily life is currently “very important” was not associated with age, college education, or married status. Effects of the disaster on religion or spirituality were positively associated with Black (54% vs. 37%; $\chi^2=11.62$, df 1, $p < .001$) and Hispanic race/ethnicity (48% vs. 29%; $\chi^2=4.95$, df 1, $p = .026$) and negatively associated with white race (33% vs. 56%; $\chi^2=16.11$, df 1, $p < .011$). Positive effects of the disaster on religion or spirituality were positively associated with Black race (49% vs. 27%; $\chi^2=6.19$, df 1, $p = .013$) and negatively associated with White race (23% vs. 47%; $\chi^2=20.65$, df 1, $p < .001$). Effects of the disaster on religion or spirituality were not associated with sex, age, college education, or married status.

Coping through religion was positively associated with Black race (23% vs. 10%; $\chi^2=11.50$, df 1, $p = .001$) and Hispanic race (12% vs. 4%; $\chi^2=7.20$, df 1, $p = .007$) and female gender (52% vs. 41%; $\chi^2=4.41$, df 1, $p = .036$), and negatively associated with White (62% vs. 78%; $\chi^2=12.21$, df 1, $p = .001$) and Asian (2% vs. 7%; $\chi^2=4.02$, df 1, $p = .045$) race.

Upset and Perceived Harm

Coping with religion was positively associated with feeling very upset at the time of the disaster (93% vs. 79%; $\chi^2=14.86$, df 1, $p < .001$) but not currently, and with reporting a great deal of perceived harm from the disaster (80% vs. 62%; $\chi^2=13.50$, df 1, $p < .001$). Religious service attendance frequency, change in attendance frequency at religious services, importance of religion or spirituality in the individual’s life, and positive effects of the disaster on religion or spirituality were not associated with level of upset at the time of the disaster or now or with level of perceived harm from the disaster. Neither level of importance of religion or spirituality in the individual’s life before the disaster nor change in religious beliefs was associated with upset or perceived harm.

Disaster Exposures and Disaster-Related PTSD

More of those with 9/11 disaster trauma exposure as defined by *DSM-IV* PTSD criteria reported attendance at religious services at least once a week (38% vs. 23%; $\chi^2=9.25$, df 1, $p = .002$). More of those who were injured in the 9/11 attacks than those who were not reported an increase in importance of religion/spirituality in their lives (54% vs. 28%; $\chi^2=7.49$, df 1, $p = .006$) and reported coping through religion (64% vs. 43%; $\chi^2=4.57$, df 1, $p = .033$). Exposure variables were not associated with change in frequency of attendance at religious services, level of importance of religion or spirituality, or level of importance of religion or spirituality in the individual’s life.

Disaster-related PTSD was associated with an increase in the importance of religion/spirituality (45% vs. 28%; $\chi^2=6.76$, df 1, $p = .009$) and with coping through

religion (57% vs. 43%; $\chi^2=3.96$, df 1, $p=.047$). Disaster-related PTSD was not associated with frequency or change in frequency of attendance at religious services or with level of importance of spirituality/religion in the individuals' life at present.

Discussion

Consistent with current national statistics (Pew Research Center 2015), members of this study's sample overwhelmingly identified with a specific religion, with the majority indicating that religion and spirituality were important to them. The experience of disaster appeared to have only modest effects on strength of religious/spiritual beliefs and importance of religion/spirituality, or in associated behaviors including attendance at religious services, and use of religious/spiritual coping. For the respondents reporting changes in religion/spirituality after the disaster, the changes were far more often positive than negative. Even though disasters are life-changing experiences, for most respondents and across the various religious affiliations, religiosity/spirituality remained consistent in their lives and was not reported to be an overwhelming means of coping with the disaster.

Members of specific religions and faith groups also differed in their disaster experience in important ways. Individuals identifying as Christians in this sample were more likely than others to emphasize the importance of religion both before and after the disaster, to cope with the disaster through religion and through support from family/friends, and to feel greatly harmed by the disaster, reflecting a generally personal religious response to disaster. Those identifying as Jewish were less likely than others to have indirect 9/11 trauma exposure through a close associate but more likely to report specific direct exposures (people falling from the towers; endangerment by the planes hitting the towers); they were less likely than other to emphasize the importance of religion both before and after the disaster, reflecting a fact-based pragmatic religious response to disaster. People identifying as Buddhist or atheist shared with respondents identifying as Jewish a lower likelihood of feeling greatly harmed by the disaster. In many ways, observed differences in religious responses to the disaster by groups affiliating with Christianity or Judaism were consistent with their religious traditions, beliefs, and personal religious practices.

In this study, women and minorities were more religious than their counterparts, minorities had more religious change than nonminorities, and women and minorities had more religious coping than their counterparts. These findings reflect the observations of other investigators that gender and minority status influence coping activities. In an Islamic sample, women used religious coping more than men (Sohrabzadeh et al. 2018). After Hurricane Katrina, African-American women expressed more concern about mental health and stress. These women indicated a greater feeling of faith and appreciation of family, friends and community (Laditka et al. 2010). In another Katrina study, religious coping was the strongest source of coping for low-income, older African Americans (Lawson and Thomas 2007).

In this study, personal severity of the disaster experience was associated with greater religiosity/spirituality. Specifically, disaster trauma exposure, injury in the disaster, perceived upset and harm, and psychological injury were associated

with personal importance of religion/spirituality, frequency of attendance at religious services, and religious/spiritual coping. It may be that people more seriously affected by disaster are more likely to emphasize the importance of religion and turn to religion for support in the process of adjusting to their disaster experience.

A limitation of the study is that the sample is from the New York City area and may not generalize to the rest of the country. New York City has a very diverse population in terms of ethnicity, race and religious affiliation. The 39% prevalence of Catholics in this sample is consistent with published population data citing a 41% prevalence of Catholics in the northeastern USA (Jones and Cox 2017). The study reflects the religion/spirituality of workers in companies on Wall Street and in the World Trade Center Towers. In addition, the interviews occurred many months after 9/11 and may have a retrospective bias. The bias could be either more negative or positive than actually experienced.

Strengths of this study include the large sample with a variety of disaster trauma exposures including a subgroup with direct exposure to 9/11 trauma. Additionally, the representation of many different faiths among the participants allowed comparison of relevant variables with religious affiliation. The structured diagnostic interview assessing full criteria for psychiatric diagnosis and the systematic and detailed assessment of disaster trauma exposures according to *DSM-IV-TR* criteria for PTSD are additional strengths of the study. The questions about religion and spirituality not only asked about religion and spirituality after the disaster but also assessed changes from before to after the disaster.

Limitations included the volunteer nature of the study sample and the cross-sectional nature of the data collection. The time between the disaster and the time of the interviews was long enough to allow some maturation of religious/spiritual inclinations, but recollection for the immediate responses may have faded with time, and additional time might have allowed further evolution of these inclinations. Few Muslims and Buddhists were included in this sample, limiting analyses of these religious groups. Because this sample represented a volunteer sample of employees from specific agencies in one city exposed to one specific disaster, the findings might not necessarily generalize to other populations and settings; for example, survivors of other disasters might be more affected in their religious and spiritual outcomes than in this sample. Additional studies are needed to determine whether some groups might evidence substantial changes in their religious and spiritual responses to disaster. Although the questions about religion and spirituality asked in the study are more complex than simple affiliation, more detail could have been elicited, such as specific religious practices and behaviors that may have clarified differences observed between religious groups.

Findings from this study have implications for disaster mental health response. Most importantly, religion and spirituality were constants within the individuals in this sample from before to after experiencing the disaster. Most of these disaster survivors did not change their religious and spiritual beliefs and practices, and their acute psychosocial responses to disaster trauma exposure did not necessarily include religious/spiritual crises or epiphanies for them. Despite the general absence of anticipated changes in religion and spirituality among disaster survivors, religion

and spirituality have relevance to disaster mental health intervention, because different approaches are needed across various religious/spiritual affiliations.

Incorporation of religion/spirituality into practice has specific implications for the widely used practice of psychological first aid (PFA). PFA is a set of pragmatic interventions and principles for responding to trauma-related emotional distress (North and Pfefferbaum 2013; Reyes and Elhai 2004; Young 2006). Consideration of an individual's religion and practices is particularly relevant for specific elements of PFA, including listening, coping and stress management, social support, and referral to formal systems of care. Appropriate consideration of religion and spirituality has the potential to enhance the effectiveness of PFA and other care in disaster interventions.

The findings of the current study suggest the need to move beyond global constructs of the roles of religion and spirituality in response to disaster. Minimally, future research needs to incorporate specific religious affiliation and identity in place of generic assertions of group membership or broad concepts of faith. Additionally, inquiry into specific religious practices and differences in them across distinct religions may better illuminate the underlying levels of religiosity or spirituality more meaningfully than can be provided through self-reported generic religiosity.

This study was most informative about the most prevalent American religions (Christian and Jewish) represented in this sample, but limited numbers of study participants in other religious groups precluded detailed analysis. Therefore, future studies need to purposively include larger numbers of members of broader categories of religious groups to better understand other religions in association with disasters in more detail. Even within the religions studied in the current study, more detailed examination of subgroups (e.g., Baptist, African Methodist Episcopal, Presbyterian) also requires samples with sufficient numbers across the denominations to understand their commonalities and differences in association with disaster.

This study exposed the limitations of conceptualization of religion and spirituality generically in the context of disaster. An obvious need for future research is to examine religious differences in greater detail, and to include greater numbers of members of religious groups such as Buddhists and Muslims and Hindus that were not well represented in this sample so that their specific characteristics can be studied in more detail. However, this study also exposed limitations of conceptualization of religion and spirituality in broadly categorical constructs that mask subtle or nuanced differences within even relatively segmented categories. What is needed is additional inquiry unconstrained by categories that can capture how individuals construct their own religion and spirituality, namely phenomenological or narrative approaches that capture the interplay among religion, personal spirituality, and the experience of disaster. Qualitative approaches present opportunities to understand more general interrelationships that categorical approaches cannot fully encompass. This deeper understanding and appreciation of the full range of human religious/spiritual experience in disaster can inform improved mental health responses.

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Compliance with Ethical Standards

Conflict of interest The authors have no conflicts of interest to report.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent The study protocol was approved by Institutional Review Boards of each participating institution, and patients provided written consent prior to participation.

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