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Thinking out of the box? A content analysis of the response to published research on the effects of remote, retroactive intercessory prayer

Alison Pritchard and Francis C Biley

Abstract

A content analysis of the rapid email responses to a potentially controversial article published in the *British Medical Journal* (BMJ) on the effect of remote, retroactive intercessory prayer on a group of patients with bloodstream infection at a university hospital in Israel was performed. The content analysis revealed 12 main themes, of which the most predominant were negative and relating to methodological concerns or comments, and/or were religious in nature, often with direct reference to God. Further responses were of a satirical nature, mocking the study. It is concluded that perhaps the real strength of the paper lies not in the results of the study itself, but in the challenge to what constitutes conventional wisdom and the encouragement to readers of the BMJ to 'Think out of the box'.

Key words: ????

Introduction

Academic scientists today mostly refuse on principle to consider or publish any research about the topics now viewed as spooky. (Midgley, 1992, p. 58)

A series of controversial, perhaps provocative papers published in the Christmas 2001 issue

of the BMJ, collectively entitled 'Beyond Science', stimulated many responses from readers. These articles were about medical issues that, by and large, would be regarded by the majority as at least peripheral to the mainstream, at worse paranormal (in the derogatory sense). They were introduced by the editor of the BMJ with the challenging proclamation that:

BMJ readers are probably similarly unaware that they are mostly positivists, subscribing to the doctrine that man can have no knowledge of anything but phenomenon. But inside every positivist there may be a shaman (a doctor-priest working by magic) trying to get out. (*BMJ* [Editorial], 2001)

The themes covered by these papers were, at least in the context of the *BMJ*, varied, diverse and untypical. Bernardi et al. (2001) investigated the effect of rosary prayer and yoga on autonomic cardiovascular rhythms, and Konotey-Ahulu (2001) described a hypothetical Professor Know-All's requirement to try to explain everything. Phillips et al. (2001) found that there were increased rates of cardiac mortality on days considered unlucky by the Chinese and Japanese, a finding consistent with there being a relationship between increases in psychological stress and increased cardiac mortality. A final article studied the effect of remote, retroactive intercessory prayer (praying for persons unknown), on a group of patients with bloodstream infection at an Israeli hospital (Leibovici, 2001). As stated by Hettiaratchy and Hemsley (2002, p. 1037), 'it was brave of both Leibovici and the *BMJ* to publish this paper and be prepared for the criticism from the outraged masses'. As with any article published by the *BMJ*, readers were invited to send email responses to the online, Internet-based 'rapid response' forum, which were then freely Available to any readers accessing the *BMJ* Internet site. Leibovici's (2001) paper, as perhaps could be expected, prompted a considerable amount of correspondence on the forum. Within a few weeks of publication, 58 responses had been posted.

Leibovici's (2001) study appeared to challenge many of the positivist, 'scientific' views held by traditional medicine. In a double-blind randomized trial a short intercessory prayer for well-being and complete recovery was said in the year 2000 for 3393 patients who had a bloodstream infection between 1990 and 1996.

The results would appear to have indicated that it appeared to significantly reduce the length of hospital stay and duration of fever, without significantly lowering the mortality rate.

The use of prayer

It has been said that 'prayer is a tool of expression of the spiritual dimension of the individual' (Saudia et al., 1991, p. 60), and that it may be viewed as 'an integral component of the spiritual life of mankind' (Lewis, 1996, p. 308). According to Thompson (1997), prayer is a feature of religions that involves a personal relationship between individuals and a God, or many Gods. When individuals ask for things to happen, via petitionary prayer, it is difficult to rationalize the outcome. If the request happens it can never be clear whether it would have happened anyway. If it does not happen it may be speculated that the act of prayer was carried out wrongly or with the wrong motive, or that there is no God to hear the prayer (Thompson, 1997). To the scientific mind this may create confusion. If it is believed that God is wise, just and omnipotent, knowing what is best, a belief in God renders all petitionary prayer unnecessary. Further to this, in claiming that a prayer was answered, it could be suggested that God's intended actions have been changed (Thompson, 1997). However, it could be argued that petitionary prayer aims to align one's mind with God's, rather than to change God's mind, in which case 'petitionary prayer appears to be literal nonsense, but psychologically and religiously useful nonsense!' (Thompson, 1997, p. 18).

Many studies have investigated the use of prayer. In an overview of 27 studies examining religion and health, Marwick (1995, cited in Lewis, 1996) claimed that, overall, involvement in religious activity seemed to lead to improved health. The findings of a study by Saudia et al. (1991) demonstrated that people found prayer extremely useful as a coping strategy before cardiac surgery. However, the purpose of this discussion is not to critique Leibovici's (2001) paper or to examine the use of prayer, but to

consider readers' responses. These responses not only provide a very interesting critique and/or defence of the work but also a fascinating revelation of healthcare professionals' and in particular the medical profession's attitudes to aspects of complementary and alternative medicine.

Content analysis

A content analysis of the Internet-published rapid responses to the Leibovici (2001) paper was performed with the aim of formulating some ideas about how the paper had been received and, ipso facto, the attitudes of those respondents to the more radical complementary and alternative therapies. The responses were examined 'with a view to grouping together similar types of utterances and ideas' (Burnard, 1996, p. 278) and categories were formulated. In order to reduce the effect of observer bias and maintain an acceptable level of accuracy, the content analysis was carried out independently by two individuals.

Results

As would be expected from a specialized professional journal, the responses were predominantly from readers with medical backgrounds (see Table 1), mainly medical professionals (25 of the 56 responses; 44.6%), including practitioners at all levels, from house officers to consultants. Many responses also came from medical researchers and lecturers. Three responses came from lay people.

The diversity amongst respondents was again reflected in their countries of origin (see Table 2). As it is online, the BMJ is easily available throughout the world to anyone with access to an online computer. Given this, it is perhaps not surprising that responses were received from 12 different countries. One response was co-written by two authors, from different countries of origin and different professional backgrounds, therefore creating 56 items in the background and origin categories, from 55 responses.

Table 1: Background of respondents

Background	Number of respondents	%
Medical professional	25	44.6
Researcher	10	17.8
Professor/lecturer/teacher	8	14.3
General practitioner	4	7.1
Lay person	3	5.4
Unknown/unclear	3	5.4
Healthcare professional	2	3.6
Student	1	1.8
Total	56	

Table 2: Country of origin of respondents

Origin of respondents	No. of respondents
UK – other	14
USA	11
UK – London	7
Israel	5
Unknown	5
Italy	3
Canada	2
France	2
Australia	2
Cuba	1
Africa	1
Brazil	1
Germany	1
Kuwait	1
Total	56

The initial content analysis revealed over 100 issues from the 55 responses. These issues were collapsed into 12 main themes (see Table 3); the most predominant related to methodological concerns or comments and were religious in nature, often with direct reference to God.

Further responses were of a satirical nature, mocking the study. As indicated in Table 4, the responses were predominantly interpreted as negative (58%), although in many instances (24%) it was difficult to define a response as either definitively positive or negative.

Table 3: Theme of response

Theme of response	No. of responses (<i>n</i>)	Positive responses (<i>n</i>)	Negative responses (<i>n</i>)	Neither positive or negative (<i>n</i>)
Methodological concerns or comments	19	0	18	1
Religious – with direct reference to God	18	4	10	4
Satirical response	10	0	7	3
Religious – referring to religious beliefs	13	6	4	3
Ethical concerns, incl. informed consent	8	2	3	3
Question of time or the nature of time	6	2	2	2
Suggestions for further studies	5	1	3	0
Element of chance or coincidence	7	1	3	3
Epistemological difficulties	4	3	1	0
Physics	4	0	2	2
Dismissal of paper as of no importance	4	0	4	0
Distrust of ‘scientific’ medicine	2	0	1	1
Total		19		

Table 4: Nature of responses

Nature of response	Number of responses	Percentage
Negative	32	58
Positive	10	18
Unable to assess	13	24

Discussion and further analysis of the main themes

Satire

As mentioned above, 10% of the responses were of a satirical nature. Hettiaratchy and Hemsley (2002) recognize that this paper challenges our ideas of cause and effect, and Leibovici (2002) notes that the issues raised by the study are completely outside the scientific model of the physical world. It is perhaps for this reason that it seems easy for the readers of the *BMJ* to dismiss it as nonsense. A typical response suggested that the person who prayed for the subjects was in fact an angel and that the random number generator that was employed was a tool of the devil (Watine, 2002). Another response (Fawcett, 2002) pondered on whether waiting lists might be eliminated with the use of retroactive prayer, clinics emptied because patients could all be cured at home and the bed crises resolved. Lisse (2001) describes the article as a contender for the 'Ig-Nobel' prize, while Foley (2001) predicted that the day this study is proved, fairies will take up residence at the bottom of his garden.

Many of these responses are witty and articulate but are not helpful in finding meaning in the study. There appears to be a recurring belief throughout history that science can explain everything, and historically some believed they could reach salvation through science, following the understanding that to study nature was to study God, its creator (Midgley, 1992). In modern times, God has been pushed into the background, but scientists continue to strive for a 'complete description of the universe we live in' (Hawking, 1990[AQ1], p. 13). Relating to Leibovici's (2001) article, many of the responses reflect this contention between religion and science.

Religion versus science

According to Larson and Witham (1998, cited in Baschetti, 2002), 93% of leading scientists do not believe in God. Baschetti (2002) clearly

states his disbelief in God and labels Leibovici's (2001) article a 'cunningly disguised form of religious propaganda ... sheer religion camouflaged with scientific terms to convince simpletons that the earth was created by God'. Baschetti's belief is that people should rely on science and reason and not religion, referring to them as if they are antagonistic concepts. However, as evident from the rapid response forum, many medical professionals appear to follow religion *and* science, far from Baschetti's (2002) supposition that 'religions ... should be disregarded if they are at odds with the biological ethics that have wisely guided humankind for millions of years'.

Dunbar (1995) observes that we are firmly locked into interpreting the world from a scientific perspective and fears that science attacks tradition and robs life of its spiritual meaning. According to Thompson (1997), science is a method of learning about the world using observation, analysis and education, formulating theories that can then be used to predict events and their consequences. An important aspect of science is that it is constantly changing (Horgan, 1996; Thompson, 1997). Theories are tried and tested and become accepted, until a new theory supersedes the old. This is what Stagnaro (2002[AQ2]) terms the 'temporary truths of science'. Capra (1991, p. 161) notes that 'whenever we expand the realm of our experience, the limitations of our rational mind become apparent and we have to modify, or even abandon, some of our concepts'. Brownnut (2002) adds that 'the world physics community looks forward with excitement and expectation to the day when their best ever theory is toppled'. This cycle has occurred since the time of the Renaissance, when people realized the Greeks had not known everything and that the Greek manuscripts did not hold all the answers (Gaarder, 2001[AQ3]) and scientists and philosophers began questioning the world around them.

Midgley (1992) suggested that science has begun to compete with religion, which is

evident in the reaction created by Leibovici's (2001) article. According to Midgley (1992), when scientific facts clash with religious beliefs, it is important not to wage war or bend the facts, but to look at the deeper meanings and significance of the issues. Further to this, topics that fall outside the narrow notion of science should not cease to be thought about, but they have to be thought about in different ways. Although Popper (1995, cited in Horgan, 1996) stated that science can never answer questions regarding the meaning and purpose of the universe, perhaps suggesting that science and religion have different, separate roles, Dawkins (1986[AQ4]) expressed the view that science and religion address the same issues and therefore cannot coexist. He maintained a strong belief in Darwinism, attributing the design and purpose evident in life to natural selection rather than being the responsibility of God. However, Dunbar (1995) clearly states that, in modern societies, it is possible for people to be both scientists and religious because the two are complementary. While science offers explanations of cause and effect processes, religion offers moral and psycho-emotional guidance.

Modern-day scientists dismiss a range of topics that nineteenth-century scientists found extremely interesting (Horgan, 1996). This is due to their differing metaphysics. As stated by Horgan (1996), the effect of scientists' own philosophies will always be an important influence. An example of this is evident in the long-held disbelief in Lovelock's claim that there may be a hole in the ozone layer, because at the time the principles that people believed in made this look impossible (Horgan, 1996).

We cannot explain or justify religion using the rationality of science, just as the existence of God cannot be proved by science. Morrell (2002) stated that it is 'difficult to describe religious matters in the language of science'. While positivists aim to explain everything using theories, experiments and rules of thumb, religion does not fit this framework. But then

much of what is worthwhile in life is not rational and is not possible to explain; for example, love, music, art and emotions (Thompson, 1997). According to Morrell (2002), religion may be seen as complex, subtle and largely irreducible, which does not translate into the scientific view that tends to be a simplistic, reductionist, either-or and cause-effect approach.

Another point of concern raised by readers was the influence of religious beliefs on the effect of prayer. According to Thornett (2001) 'many religious groups do not accept the power of prayer given by those with different beliefs' and the idea is proffered that the power of prayer is perhaps 'belief-specific'. Furthermore, Pucci (2001) argues 'whether a Jew would be accepted to participate in a trial in which a Palestinian prayed for Allah for him', concluding that 'people are turning more and more to the saints rather than to administrators and politicians to find solutions for a better healthcare management'.

Generally, it seems that science and religion are not entirely separate concepts. In many areas the thoughts underpinning both views overlap, for example, in their mutual endeavour to understand the world around us, why we are here and where we came from. Moreover, Hawking (1990[AQ1], p. 175) describes the 'ultimate triumph of human reason' to one day 'know the mind of God'. Emmens (2002) claims that techniques such as prayer should be treated with respect, declaring that:

Just because we ignore, are unaware, or do not understand it [this research] does not mean that it cannot be possible. Just as, if a technique or procedure is yet to have a clear scientific rationale does not mean it is invalid.

Morrell (2002) points out that religion is often underpinned by a belief that humans are of greater value than solely the value of the molecular material we are made of. Reductionist scientific materialism could never explain

Leibovici's (2001) study, since the proof would need to be of a material nature.

Time

In the same way that Leibovici's (2001) study challenges our notions of science and religion, so the study of retroactive prayer challenges our ideas of linear time. Several disbelieving readers (including Lachmann, 2002) call for the study to be repeated with the control group being prayed for. These readers feel that if they could see new results in a further study then the method of retroactive prayer would be proved as a valid intervention. However, as eloquently explained by Peled (2002) this would lead to a paradox, because:

When we change the results retroactively, the results are changed for us in the past (in our past) since we have only one past – we won't know about the change at all. The original results (pre-intervention) are lost for us.

Peled (2002) also suggests that only someone standing outside our timeline might be able to see the change, because we have only one past and if someone changes it we will have no awareness of the change. This explanation would invalidate the claim that further, future prayers could possibly change the outcomes of the study (Middlemass, 2001). According to Hopkins (2001), who refers to Star Trek 'philosophy', 'the first rule of time travel is that you cannot change the course of history, otherwise you get into an infinite regress', in which case, the results were predetermined. However, if we are to believe in Star Trek, then we are also led to believe in 'warp drive', the depiction of faster-than-light transport, which Stephen Hawking dismisses as impossible (Horgan, 1996). Perhaps some should not take Star Trek too seriously.

Brownnutt (2002) reiterates Sagan's (1987[AQ5]) assertion that 'we go about our daily lives understanding almost nothing of the world' by pointing out that physicists work

continuously to break the laws of physics, trying to topple the seemingly infallible rules. Even the theory of relativity, describing the force of gravity and the large-scale structure of the universe, and quantum mechanics, relating to the small-scale make-up of the universe, are constantly being challenged. According to Hawking (1990[AQ1]), these two theories are inconsistent with each other, and therefore cannot both be correct. One criticism of these theories is their reductionist approach. A major endeavour of physics is to create a complete unified theory that might explain everything, perhaps a 'quantum theory of gravity' (Hawking, 1990[AQ1], p. 12).

Just as the laws of physics have changed over the years, so have our ideas about time. In 1900 there was a belief in absolute time but nowadays theory of relativity suggests that the speed of light is the same for each observer no matter how he is moving (Hawking, 1990[AQ1]) and time is viewed as a much more personal concept. Eddington (1927, cited in Coveney and Highfield, 1990) coined the phrase 'the arrow of time', reflecting the fact that time is directional, like an arrow.

Our understanding of time is described by the three arrows of time, outlined by Hawking (1990[AQ1]). The thermodynamic arrow of time states that there will always be an increase in disorder. This is illustrated using the example of a cup falling from a table. The cup on the table is in a high state of order. When it falls and breaks on the floor it is in a state of disorder. This could never be reversed, like a film played backwards, since 'time cannot run backwards' (Coveney and Highfield, 1990). The psychological arrow of time is described by Hawking as our perception of time passing in a direction in which we remember the past, not the future. The cosmological arrow of time reflects the universe expanding, not contracting. All arrows point in the same direction. Relating this to Leibovici's (2001) article, the notion of retroactive prayer goes against the arrows of time, making it difficult for positivist readers to

accept that there is any value in this study. Further criticisms were based on methodological concerns, including the issue of ethical consent to treatment, accounting for 19% of the responses, of which 95% were negative.

Methodological criticisms

Amongst the criticisms of the study method were the responses of Barnes (2002) and Falaschi (2001) who both cynically questioned whether the effects of prayer were 'dose-dependent'. These readers were curious as to whether a short prayer, of a few seconds, said for many people would have a different effect to a long prayer, of several hours, said for a single person. Again this seems to reflect the positivist, scientific thinkers trying to fit a non-scientific phenomenon into their rational framework. This is summed up by Lachmann (2002, p. 56) who states that:

... a retrospective randomized study simply cannot answer the question that Prof. Leibovici is posing. This says nothing, one way or the other, about the efficacy of prayer.

Lachmann's conclusion is based on his statistical rationalization of the randomization of the two groups.

Other responses were less reasonable. For example, Silva (2001) suggests that God played a role in the coin tossing and allocated those who had longer hospital stays to the control group, while Leibovitz (2001) refers to this as 'a first Evidence of Providence Based Medicine'. Oman (2001) suggests the element of chance in proposing that the study can quickly be repeated a vast number of times until the desirable results are obtained. Oman is perhaps reiterating Hettiaratchy and Hemsley's (2001) claim that this study supports the power of statistics, not the power of prayer.

It appears easy to identify design faults in order to dismiss this work. Again, the study

does not fit with our positivist scientific approach and many readers have criticized the statistical content. Others, unable to rationalize these findings, refer to the element of chance or coincidence. However, this study challenges our preconceptions of the nature of knowledge and research

In questioning the nature of knowledge, challenging our ideas of time and attempting to explain religion with science, the Leibovici (2001) article has challenged some to 'think out of the box'.

Discussion

This article creates a disparity that is almost paradoxical in nature: Leibovici (2001) is trying to explain a non-rational, non-scientific phenomenon in scientific terms, such as using a double-blind, randomized clinical trial and performing statistical analysis of the findings. However, as Morrell (2002) stated, it is 'difficult to describe religious matters in the language of science' and 'the tools used in each discipline are too different from each other to be mutually transferable or applicable in both domains'. A rational scientific perspective dismisses the use of retroactive, intercessory prayer since there is no way of explaining this phenomenon that challenges the concept of linear time. Because the findings cannot be rationally explained, it is easy to dismiss the study and, similarly, other evidence from the fields of complementary and alternative medicine (CAM), many of which have been used for hundreds of years with great success.

There is an abundance of anecdotal evidence indicating that many alternative therapies are consistently effective in treating certain conditions, although it cannot be explained exactly why or how these therapies work. Dawkins (cited in Diamond, 2001) defines 'scientific medicine' as that which stands the ordeal of being tested, while 'alternative medicine' is that which cannot be tested, but the distinction is not always easy. Barrett (2001,

p. 20) notes that 'a few, such as biofeedback, chiropractic and physical therapy, are considered conventional by some, alternative by others'.

Attitudes towards CAM

As stated by Marston (cited in Jonas and Levin, 1999), there is a need for developing new methods of testing the effectiveness of CAM, in addition to complex, large-scale, double-blind clinical trials. Marston notes that efforts are being made to gather information regarding symptomatic and clinical improvements in patients. Many patients seek to augment the benefits of orthodox medicine through the use of CAM, and alternative practitioners, in line with orthodox practitioners, must remain committed to protecting the public against fraudulent practice (Marston, cited in Jonas and Levin, 1999). Dawkins (cited in Diamond, 2001, p. 2) proclaims this as a time 'when orthodox medicine seems to be failing and may even have given up on us' and refers, rather cynically, to the 'complementary vultures' who can see money in hope, and the 'more desperate the hope, the richer the pickings'.

Linde and Jonas (1999) note that students of medicine are generally becoming better informed regarding the use and effect of many alternative therapies, and that patients are increasingly turning to these therapies either instead of, or in addition to, orthodox treatments. However, remembering that Leibovici's (2001) study was conducted at a teaching hospital in Israel, it is interesting to note that a survey involving Israeli medical students (Sahar and Sallon, 2001) indicated that students felt that the present curriculum does not provide enough education on the theoretical and practical aspects of CAM. The majority of students showed an interest in these therapies, and many had had practical experience through treatments or courses. Similarly, nurses in Israel felt that they did not receive enough CAM education and were wary of the use of these therapies, few using any alternative therapies in their nursing practice (DeKeyser et al., 2001).

Further to this, a study among American academic physicians concluded that those with more knowledge of CAM were more likely to perceive the therapies as useful and more likely to recommend therapies to their patients (Rosenbaum et al., 2002). Surprisingly, Bourgeault (1996) reported that Canadian practitioners indicated that their main sources of information relating to CAM were their patients and the lay press.

In contrast to the above reasons for physicians choosing CAM, cancer patients in Hawaii reported declining all or part of the recommended conventional treatment (surgery, chemotherapy or radiation) because of a lack of understanding, a distrust in the treatment or concern that the conventional treatments would harm their bodies (Shumay et al., 2001). Whereas the above studies suggest the need for better CAM education for physicians, this latter study concludes that patients need further education regarding *conventional treatments*. Shumay et al. (2001) suggest that better education could improve physician–patient communication, break down the barriers and facilitate well-informed treatment decision-making.

However, with the above studies in mind, it would seem that there may also be a need for better CAM education for practitioners in order to promote the physician–patient relationship, and Bourgeault (1996) noted that, in a few instances, the patient's use of alternative therapies caused some tension in the relationship. A further point pertaining to the practitioner–patient relationship is that Crock et al. (1999) found that many American patients were not informing their general practitioner of their use of CAM, leading to a breakdown in communication and, in some instances, a termination of the relationship altogether. Having said this, Crock et al. (1999) then go on to conclude that physicians demonstrated an open attitude toward alternative therapies, which does not reflect the predominantly negative responses shown towards Leibovici's (2001) study of retroactive, intercessory prayer.

While Adams (2001) reported that Australian general practitioners had found a lack of time to be a serious constraint on their use of CAM, Bourgeault (2001[AQ6]) found that Canadian practitioners had limited knowledge of CAM and were wary of their use since many had not been scientifically proven. Bourgeault (2001[AQ6], p. 1679) states that:

Physicians' attitudes and reactions to their [CAM] use by patients are influenced to a greater degree by the efficacy or inefficacy of standard treatment and the invasiveness of the alternative therapy than by the efficacy of the alternative therapy used.

Contrary to those physicians described above who would like better CAM education and are already referring patients to alternative therapists, there remain those in opposition, such as Goodman (2001), who are 'attacking not only the pseudoscience of the complementary lobby, but also the writers who extol its worth in the media' (Jewell, 2001).

Conclusion

Leibovici's (2001) article appeared to be provocative and challenging. It forced readers to consider the contention between religion and science, to reconsider ideas relating to linear time, and to consider the possibility of alternative therapies that do not fit the framework of scientific rationality. Leibovici (2002) is careful to note that he believes that prayer is a real comfort and help to a believer, and should not be tested in controlled trials.

Leibovici's (2001) study could suggest that there is a need to find a new 'language' for explaining these phenomena, and to find more creative ways of presenting evidence of the success of CAM besides double-blind random-controlled clinical trials. Morrell (2002) stated that it is 'difficult to describe religious matters in the language of science' and that 'the tools used in each discipline are too different from each other to be mutually transferable or applicable in both domains'.

Although there is limited research into orthodox practitioners' attitudes towards CAM, studies do suggest a need for better CAM education to improve the practitioner-patient relationship, through better communication, and to increase referral rates to alternative therapists.

Generally the responses to Leibovici's (2001) study using remote, retroactive intercessory prayer were of a negative nature, many using satire and dismissing the study as nonsense. However, Leibovici (2002) adds that this article tests our ability to comprehend a phenomenon that falls outside our scientific framework. The real strength of the paper lies therefore not in the results of the study itself, but in the challenge to what constitutes conventional wisdom and the encouragement to readers of the *BMJ* to 'think out of the box'.

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