Spirituality predicts outcome independently of expectancy following flower essence

self-treatment

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Abstract

Objective: To determine whether absorption and spirituality predict the placebo response independently of expectancy.

Method: This was an open study of self-treatment with self-selected Bach flower essences. Participants' expectancy of the effect of flower essences, attitudes to complementary medicine, holistic health beliefs, absorption and spirituality were measured prior to treatment. One month after the start of treatment, participants responded to an e-mail enquiry about symptom change using a single 7-point change scale.

Results: 116 participants (97 university undergraduates and 19 staff) completed all assessments. Spirituality and absorption together predicted additional variance compared with a cluster of expectancy measures comprising expectancy, attitude to complementary medicine and holistic beliefs (p = .032), and spirituality alone (but not absorption alone) predicted more additional variance than the expectancy cluster (p = .014).

Conclusion: Our data are inconsistent with conventional explanations for the placebo effect. The mechanism underlying the placebo response is not fully understood.

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Flower essences (also called flower remedies) are made by floating flowers in water and preserving the water in brandy. This preserved water is then further diluted to produce the small bottles of flower essence that are sold in chemists and health stores as a self-help remedy for psychological symptoms. A systematic review of randomised controlled trials suggests that flower essences are no different from placebo [1]. Two double-blinded placebo controlled trial studies (Ns of 100 and of 51) failed to show a significant difference with placebo [2,3], though smaller unblinded or case studies have shown that flower essences are beneficial [4]). As placebos are particularly effective for psychological symptoms [5], it seems reasonable to conclude [1,2] that flower essences are effective placebos.

A major advantage of using flower essences to investigate placebo or non-specific effects of treatment is that, although they are pharmacologically inactive, many people believe that that they have a specific effect, and so a placebo treatment can be delivered in a real-life therapeutic context rather than laboratory analogue, and without the need for deception. Furthermore, in contrast to other many other complementary and alternative medicines (CAMs), there is no need for therapist involvement. In therapist delivered CAMs, the non-specific mechanisms may be similar to those in psychotherapy, and these include the therapeutic bond [6]. Flower essences are designed to be self-selected and as a therapist is not needed, they provide a simpler paradigm for investigating non-specific effects.

Two mechanisms are thought responsible for placebo effects. Response expectancy theory [7,8] suggests that placebo effects are due to patients expecting a therapeutic action. Conditioning theory suggests that if an active treatment is associated with a delivery system then the delivery system acquires therapeutic properties by association. The majority of research supports the view that, irrespective of whether expectancies are acquired cognitively (e.g., information) or through learning, placebo effects are mediated through expectancy [9]. However, one recent meta-analysis suggests that non-conscious learning and conscious expectancy learning can both contribute to the placebo [10]. In the case of flower essences, the only plausible explanation is that of expectancy. Flower essences are not pharmacologically active so conditioning is not possible, nor are 'medicines' such as homeopathy that use similar delivery systems (i.e., small amounts of brandy) [11]. Thus, it seems plausible that flower essences are effective because people acquire beliefs that they are effective, i.e., through a consciously mediated process involving expectancy.

If placebos are effective via a mechanism of conscious expectancy, then variation in outcome should correlate only with the patient's expectation of effectiveness. There are limited data suggesting that mechanisms in addition to expectancy are involved in placebo responses. In two analogue studies [12,13], participants were given psychological coping strategies (distraction and imagery) and their reported ability to become absorbed in these tasks was measured along with the expectancy that they would be successful. Reported (task-related) absorption predicted pain relief independently of expectancy. The authors interpret these findings that psychological coping strategies have an effect on pain relief independently of expectancy.

In addition, there is some indirect evidence that expectancy is not a good predictor of placebo response in complementary and alternative medicine (CAM) (i.e., real-life rather than analogue studies). A large (N = 202) double-blinded, placebo controlled study of a homeopathic remedy for asthma in general practice showed a significant improvement in both conditions, but no difference between homeopathy and placebo [14]. The authors measured attitude to CAM prior to treatment. However, despite the high power of the study, there was no significant association between attitude to CAM and improvement on either physiological measures or quality of life [15]. In another study [16], the effectiveness of acupuncture was compared with standard treatment in an open randomised controlled trial. Both groups showed significant reduction in pain but there was a small significant (p = .03) advantage to acupuncture at 24 months. Prior to treatment 127 patients believed that acupuncture would be effective and 54 did not know or (of whom only one) thought it would not work. In the acupuncture group, improvement at 24 months in those who believed in acupuncture was non-significantly *less* than those who were unsure. In the standard treatment group there was a non-significant trend in the opposite direction. These data raise the possibility that some form of non-specific coping mechanism is having a therapeutic effect in CAM in addition to that of expectancy.

Personality correlates of a behaviour can provide insight into the mechanisms underlying that behaviour. There has been considerable research, much of it in the 1950s, 1960s, and 1970s aimed at discovering a placebo responding personality, but despite this considerable research the consensus view is that such a dimension does

not exist and that placebo responding may not be a stable characteristic [17]. Fisher and Greenberg [18], however, suggest that there is some evidence that acquiescence is a predictor, though results are by no means consistent. Acquiescence scales measure either affirmative response bias (the tendency to respond yes) or a tendency to agree with others' assertions. In the case of either interpretation, an association between acquiescence and placebo responding, were it to be found, would not suggest a placebo-related mechanism separate from that of expectancy.

An entirely different approach to examining personality correlates of placebo responding is to test the predictors of *use* of CAM, on the theoretical rationale that people who use CAM are likely to be those who benefit most. Several psychological factors predict use of CAM [19] including health beliefs [20]. There is evidence that CAM users are higher on trait absorption [21] and on spirituality [22]. The association with absorption is interesting in view of research showing that absorption in a coping strategy (i.e., task specific rather trait absorption) predicts outcome independently of expectancy [12,13]. In addition, absorption is associated with better health outcome [23,24], as is spirituality [25,26]. The reason for these associations is not entirely clear – there are several explanations of why spirituality may be related to health [27], which may or may not be linked to a placebo-related mechanism

The aim of this research is to examine whether personality predicts outcome independently of expectancy in a naturalistic observational study where participants are provided with (genuine) flower essences. We test whether absorption and spirituality (i.e., two personality predictors of CAM use), either together or separately, predict outcome in addition to the effect of expectancy. As absorption and spirituality

are correlated with CAM use, and hence are likely to be correlated with expectancy, our aim is to establish whether either or both of these personality variables predict outcome once expectancy has been controlled for.

Two methodological problems arise when determining whether a personality factor predicts outcome in addition to expectancy. The first is that the expectancy and personality measures may differ in terms of reliability. If the expectancy measure is less reliable, then a finding that personality predicts independently may be an artefact created by differences in reliability. The second problem relates to the conditioning-expectancy debate and the extent to which expectancies are introspectable. Kirsch [28] has suggested that expectancies must be introspectable (to treat them otherwise leads to unfalsifiability), but may not be conscious at a particular moment in time. Thus, if expectancy is measured at one time, it may not correspond to expectancy at some other time.

Our solution to these difficulties is to use a cluster measure of expectancy by adding to the estimate of expectancy measures of attitudes and beliefs that are consistent with expectancy. If people have a positive attitude to CAM or holistic health beliefs, then it is reasonable that these people are likely to have greater expectancies of success of flower essences. The use of these additional expectancy-related measures not only increases reliability but also provides a correlate of expectancy whether or not expectancy is conscious at the time of measurement.

Method

Procedure

Advertisements were placed on the University of Plymouth campus advertising a free trial of Bach flower essence in return for completion of questionnaires (Bach flower essences are the original and most widely known type of essence). The advertisement provided details of a commercial website associated with these essences, www.bachfloweressences.co.uk . Advertisements were also sent to undergraduates by email, and recruitment was also achieved through student-to-student contact. Participants were informed that the researchers were evaluating flower essences, that the efficacy of these essences was controversial but that some people found them helpful. They were invited to attend on one of four sessions to collect their flower essence and complete questionnaires, and there was no payment to take part. At the sessions, consenting participants were shown the list of 38 Bach flower essences copied from a commercial leaflet which described the purported benefits of the different essences, and invited to chose up to six. The researchers then made up an individualised essence by adding two drops of the 'stock essence' of the selected essences into a 10cc bottle of brandy diluted (60% with 40% with water). This procedure follows that advised by manufacturers for producing a 'genuine' essence. Participants were instructed to take three drops twice daily of their individualised preparation per day. Participants completed questionnaires while their essence was being made up. After one month, participants were sent an email asking them to assess outcome; participants responded to this request by email. Ethical approval was granted by the School of Psychology Ethics Committee and by the Faculty of Science Ethics Committee at the University of Plymouth.

Questionnaires

Expectancy

Participants responded to a single item, 8-point scale indicating the extent to which they believed that the symptoms would be improved by the flower essence, with verbal descriptors for the end points. (8 = Yes, I definitely think it will help, 1 = I think it very unlikely it will help me).

Attitudes and beliefs to complementary medicine

The 11-item Holistic Complementary and Alternative Medicine Questionnaire (HCAMQ)[29] has two inter-correlated but factorially distinct subscales: attitudes to complementary medicine and holistic health beliefs. The questionnaire was scored so that high scores indicate positive attitudes to CAM and high levels of holistic health beliefs.

Absorption

The 34-item Tellegen Absorption scale[30] is a perceptual processing style, measuring the extent to which people attend to or become absorbed in experiences. The scale is correlated with a wide range of other scales and behaviours [31]. High scores indicate greater absorption.

Spirituality

The 22-item Spiritual Involvement and Beliefs Scale – Revised (SIBS-R) is the revised version of an earlier 39-item scale[32] which purports to measure spirituality

in contrast to religiosity. Factor analysis shows the scale to be unidimensional, and high scores indicate greater spirituality.

Perceived change

Outcome was measured by sending participants an email which reminded them of the purported benefits of their selected essences and asked them to respond on a 7-point change (-3 = worse , +3 = better) scale whether they had experienced any benefit or worsening of their symptoms

Results

The sample

One hundred and twenty four people enrolled for the study of whom 116 (36 males, 80 females) responded to the email to assess outcome. Of those who completed the study 97 were undergraduates and 19 were staff (administrative, technical or academic). The number of people at each age range were: 88 people aged 18-24, 16 aged 24-35, and 12 aged 35-55. There was a wide range in expectancy: the number of people responding to each of the expectancy response options were 1 = 2, 2 = 4, 3 = 11, 4 = 15, 5 = 35, 6 = 34, 6 = 11, 8 = 4. The number of people responding to each of the perceived change response options were -3 = 0, -2 = 6, -1 = 10, 0 = 33, 1 = 46, 2, = 17, 3 = 4.   Thus, 13.8% reported a deterioration, 28.4% no change, and 57.8% an improvement in their symptoms after using flower essences.

Correlations and regression

The Pearson correlations between the predictor variables and with outcome is shown in Table 1. Expectancy correlates highly with attitude towards CAM and with holistic health beliefs, which is consistent with our use of these additional scales as an expectancy cluster. Absorption and Spirituality are also highly correlated. The high correlation between spirituality (a trait measure) and expectancy (a context-specific measure) suggests that expectancy is affected to large extent by spirituality. Expectancy correlates with outcome but the highest correlation with outcome is spirituality.

We used a hierarchical regression to test whether there was a significant additional effect of absorption and spirituality compared to the cluster expectancy measure. Table 2 shows the results of regression analysis where we compare between two models. Model 1 always consists of the expectancy cluster (expectancy plus attitude to CAM plus holistic health beliefs). Model 2 consists of model 1 plus absorption and spirituality either together or separately.   Adding spirituality and absorption to the expectancy cluster accounts for significantly more variance than expectancy alone, as does adding spirituality without absorption, whereas adding only absorption does not account for significantly more variance than the expectancy cluster alone.   Model 1 fails to achieve significance.

Discussion

If expectancy were the only mechanism responsible for the placebo response to flower essences, then personality should not predict outcome independently of expectancy.

We found that the (highly correlated) personality constructs of absorption and spirituality explained additional variance compared with expectancy using a procedure that is highly conservative. We used a cluster measure of expectancy, including expectancy, attitudes to CAM and holistic beliefs. Attitudes to CAM and holistic beliefs were correlated with expectancy, consistent with our argument that their inclusion in a cluster measure would create a more complete and reliable measure of the construct of expectancy. Our use of this cluster measure makes it les likely that ouor findings are an artefact of scaling or due to temporal variation in the introspectability of expectancy.

Further analysis suggested that it was spirituality rather than absorption that was the important variable in predicting outcome. Absorption alone failed to predict more variance compared with the cluster measure of expectancy, whereas spirituality alone did. Thus, it seems reasonable to conclude that there is a mechanism related to spirituality that is involved in the placebo response but which is independent of expectancy.

These data are difficult to interpret because the constructs being assessed by absorption and spirituality scales are not entirely clear. Absorption correlates with a wide variety of other constructs, including fantasy proneness, hypnotisability and cognitive performance tasks, and is commonly believed to represent openness to experience in the five factor model (FFM) [31]. By contrast, there is some evidence that spirituality is a personality dimension which is factorially distinct from and makes additional predictions compared to the FFM [33]. However, we found that spirituality and absorption to be highly correlated ($r = .47$) and an alternative view is

that spirituality is multi-construct and different constructs correlate with different dimensions of the FFM [34]; It has also been suggested that spirituality is a belief system and so not a personality dimension [35].

Absorption is correlated with acquiescence [36] and which has been controversially linked to placebo response [18]. However, there is some evidence that absorption is not a response bias [37]. We cannot, of course, rule out the possibility that spirituality measures some form of response bias.

In sum, although we found an interesting effect, that effect is difficult to interpret. We used two highly correlated scales, absorption and spirituality, but these scale behaved differently in terms of predicting outcome. A careful reading of the literature relating to these scales suggest that it is not clear what exactly is measured by absorption and spirituality scales, nor what the difference is between them – or for that matter if there is a relationship with latent variables acquiescence. Rather than attempt an interpretation, we simply list some of the possibilities with suggestions for further investigation.

First, it may be that spirituality is associated with some form of response bias and so is our outcome measure: consequently our results are response bias-mediated. The problem with the response bias explanation is that, if it were true, it is difficult to see why we have obtained a difference between spirituality and absorption, particularly when the absorption scale involves only positive items whereas the spirituality scale we used has both positive and negative items, and so should be less prone to affirmative response bias effects.

Second, if taking a flower essence elicited some coping strategy based on imagination, then absorption should predict outcome independently of expectancy (as found in the analogue pain studies [12,13]. We did not find absorption predicted outcome, but it may be that spirituality is a better measure of the tendency to become absorbed in a task than absorption itself. Thus, people who have better imaginations have greater placebo effects for a given level of expectancy, and that spirituality taps into this level of imagination. This explanation, however, would suggest that absorption and spirituality are different measures of what they are commonly assumed to measure.

A third explanation is that the taking of flower essences induces some psychological change, particularly in those high in spirituality, and this change then has some health enhancing effect.. Oman and Thoresen [27] refer to this as a psychobiological interpretation, though it remains a matter of speculation what this psychological change should be, or why those high in spirituality should change more.

A fourth explanation (a 'superempirical interpretation' in Oman and Thoresen's classification) is based on the assumption that quantum events have an impact on biological systems [38] and that a particular type of 'observational stance' has a therapeutic effect because it creates entanglement within or between people [39,40]. Hyland [41] suggests that absorption and spirituality are indicators of proneness to entanglement, and therefore absorption and spirituality should predict outcome in CAM. However, although a different study [42] has produced data consistent with entanglement theory (correlation of EEGs of spatially separated people), and

absorption has been implicated in CAM response [43] it is premature to come to any conclusion. Entanglement theory would predict that spirituality (or whatever construct predicts outcome for flower essences) would also be a predictor of therapist effectiveness, and this leads to a testable prediction with regard to therapist effects, which are currently difficult to explain [44].

There may be other explanations which can explain our data, but at the moment we can only conclude that there is no clear explanation. It is unclear whether findings in real-life therapeutic contexts (such as we used) are the same as effects obtained in laboratory analogue studies, and which have provided most of the support for the expectancy explanation for placebos. Our research paradigm is novel, and contextual factors may moderate factors affecting the placebo response. A more precise understanding of the predictors of benefit that are independent of expectancy may throw more light on the underlying mechanism or mechanisms. In particular, the paradigm allows researchers to evaluate questionnaire item in terms of their ability to predict outcome, and therefore provides a novel way of validating the items of spirituality questionnaires.

Our study provides evidence, contrary to the dominant view, that there is a placebo-responding personality, but the personality dimension is not expected from our current understanding of placebo mechanisms, namely, expectancy theory. Furthermore, the data do not appear to be consistent with a response bias interpretation. Our data do not explain why, independently of expectations, some people experience benefit from pharmacologically inert substances. The placebo response is not fully understood.

Table 1. *Correlations between measures used in the study (N = 116).*

	Outcome (perceived change)	Expectancy	HCAMQ: attitude to CAM	HCAMQ: Holistic health beliefs	Absorption
Expectancy	.26*				
HCAMQ: attitude to CAM	.19*	.45**			
HCAMQ: Holistic health beliefs	.11	.24**	.13		
Absorption	.23*	.25**	.23*	.22*	
Spirituality	.33**	.58**	.40**	.29**	.47**

*p < .05, **p<.01.

Table 2. *Multiple regression comparing two models where outcome (perceived change) is the dependent variable.*

	Model 1*	Model 2	Adjusted R^2 for model 2	Significance of R^2 change between models 1 and 2
Test 1	a. expectancy b. attitude c. beliefs	Model 1 + d. absorption e. spirituality	.080	.032
Test 2	a. expectancy b. attitude c. beliefs	Model 1 + d. absorption	.056	.081
Test 3	a. expectancy b. attitude c. beliefs	Model 1 + d. spirituality	.081	.014

* Adjusted R^2 for Model 1 = 0.038; Significance for Model 1, p = .062

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