



Cognitive structuring and placebo effect☆

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ABSTRACT

In much of the research concerning the placebo phenomenon, the idea that placebo effects may vary in strength depending on a patient's personal characteristics or traits has been investigated. Findings regarding possible personality differences in placebo response, however, are conflicting and non-systematic. In this article a new theoretical attempt to explain the placebo phenomenon is offered. The authors postulate that the power of the placebo effect is moderated by the extent of use of cognitive structuring, which in turn is influenced by the interaction between the individuals' level of need for cognitive closure and their ability to achieve this state. To test this assumption, a study using a placebo with information given to participants that this "medicine" improves mood and well-being was conducted. The results obtained fully support the predictions. The impact of this finding both for the theoretical understanding and practical implications of the placebo effect is presented.

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The scientific explanation of mind-body relationships has been crucial in developing our understanding of health, illness and well-being. One of the most important and simultaneously mysterious phenomena of this kind is the placebo effect. The phenomenon of the placebo effect has been the subject of steadily growing interest in recent decades. A growing body of research suggests that a wide variety of inactive substances – used as sham medication – can alone improve the health or well-being of some people (e.g., Babel, 2013; Kaptchuk et al., 2010; Miller, Colloca, & Kaptchuk, 2009; Spiro, 1986).

Placebo treatments have been reported to help some patients with a wide range of conditions, including pain, blood pressure, asthma, Parkinson's disease, anxiety, depression, schizophrenia, insomnia, and Alzheimer's disease (see: Benedetti, 2009; Brody & Brody, 2000 for review). Unfortunately, although the placebo effect is one of the best known, at the same time it is paradoxically one of the least understood curative processes (e.g., Abelson, Abelson, & Dewey-Mattia, 2010; Benedetti, 2009; Hrobjartsson & Gotzsche, 2001). The placebo phenomenon has been investigated at a range of levels, from the psychological, through the physiological, to the neurochemical. At the psychological level, expectancy, classical conditioning, and observational learning are usually treated as the primary mechanisms. The expectancy explanation postulates that the placebo reaction is mediated by the

expectation that a given treatment will reduce symptoms of illness (e.g., Geers, Weiland, Kosbab, Landry, & Helfer, 2005; Kirsch, 1990). According to the classical conditioning attempt, the placebo response emerges as a consequence of consecutive pairing of neutral stimuli (like colour of the pill or smell in the physician's surgery) with effective medical treatment (Ader, 1997; Dolinska, 1999; Stewart-Williams & Podd, 2004). More recently, Colloca and Benedetti (2009) have shown that observational learning (or modelling) may also be treated as an explanatory mechanism for the placebo effect. They demonstrated that the magnitude of the placebo response induced by observational learning was even greater than the effect induced by verbal suggestion (see also: Hunter, Siess, & Colloca, 2014; Świder & Babel, 2016). It is true, however, that the placebo helped only some people and only in some conditions. Research along these lines has shown that placebo effects may vary in strength depending on some patient's characteristics or traits. First of all, in many studies concerning the placebo effect sex differences were taken into consideration. However, the results obtained are inconsistent and unclear. In some experiments males demonstrated a stronger placebo response than females (e.g., Aslaksen, Bystad, Vambheim, & Flaten, 2011; Aslaksen & Flaten, 2008; Flaten, Aslaksen, Finset, Simoensen, & Johansen, 2006), while in other studies sex was not a predictor of placebo response (e.g., Averbuch & Katzper, 2001; Casper, Tollefson, & Nilsson, 2001). Klosterhalfen and Enck (2008) have shown, in turn, that sex differences in placebo reactions may depend on the way the placebo is delivered.

In many studies, researchers have investigated different personality traits as predictors of placebo response level (e.g., Evans, 1974; Gallimore & Turner, 1977; Geers, Helfer, Kosbab, Weiland & Landry, 2005; Geers, Kosbab, Helfer, Weiland, & Wellman, 2007; Geers,

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Wellman, Fowler, Helfer, & France, 2010; Morton, El-Deredy, Watson, & Jones, 2010; Pecina et al., 2013; Shapiro, 1971; Vallance, 2006).

Although empirical evidence concerning personality predictors of placebo responsiveness does exist, one should concede that their serious weakness is the relatively low amount of variance explained (only the previously mentioned work by Pecina et al. [2013] is an exception to this rule). It therefore seems obvious that there is a need for a new theoretical approach to the placebo effect to find additional factors that impact patients' responsiveness. In this paper we examine the hypothesis that cognitive structuring is involved in producing the placebo effect.

Cognitive structure is one of the most useful concepts in modern psychology. A cognitive structure is a mental representation of an object or an idea (Sedikides & Skowronski, 1991). At the base of all cognitive structures rests the process of categorization. Categorization can be viewed as a process by which concrete and/or abstract items are grouped under a larger and more abstract umbrella and viewed as equivalent. Cognitive structuring (CS) has frequently been regarded as the most efficient way of making sense of the world. It fulfils many functions in human information processing, such as selection of information, as well as avoidance of inconsistent information and/or irrelevant information, all of which are functional in achieving certainty in the most efficient way. Finally, cognitive structuring may facilitate achieving certainty by adding previously stored information concerning the validity of an inference (Fiske & Linville, 1980). All these characteristics of CS explain the belief that CS is the most efficient and relatively effortless way of gaining a sense of certainty and control over the situation (Bunder, 1962).

In social psychological research, cognitive structuring is most often linked to epistemic motivations (e.g. tolerance of ambiguity, dogmatism, open mindedness, certainty orientation, need for cognition, desire for simple structure, personal need for structure, need for cognitive closer, and preference for consistency). Bar-Tal, Kishon-Rabin, and Tabak (1997) suggested that since all these conceptions share a very important component, they can all be described as representing the same concept, namely the need for cognitive structure (NCS), which is defined as the extent of the preference to use cognitive structuring as a means of achieving certainty. The common assumption shared by all the conceptions is that the cognitive processes used by high-NCS individuals to reduce uncertainty are "category based" (Brewer, 1988; Fiske & Pavelchak, 1986), non-systematic, and heuristic. They prefer to use holistic and rapid processing, crudely differentiated categories, black-and-white type solutions, and overly-simplified dichotomizations. In contrast, low-NCS individuals are believed to prefer to reduce uncertainty using "piecemeal" or "systematic processing", which is manifested in vigilant behaviour based on a systematic and effortful search for relevant information, its evaluation, and unbiased integration (Chaiken, Liberman, & Eagly, 1989; Janis & Mann, 1977). It is important to note that NCS is often conceptualized as a dimension which, at its high pole, predisposes individuals to use cognitive structuring to achieve certainty. At its low pole, however, it is not associated with indifference or low motivation to achieve certainty, but with a high tendency toward piecemeal processes (Kruglanski & Webster, 1996).

Bar-Tal (1994a,b, 2010; Bar-Tal et al., 1997), however, argue that people may differ not only in their need for cognitive structure, but also in their perceived ability to achieve cognitive structure (AACS), which is orthogonal to the need. AACS refers to the extent to which individuals believe that they are able to employ information processing processes (cognitive structuring or piecemeal) that are consistent with their level of NCS. Thus, the fact that some people prefer to reduce uncertainty by cognitive structuring does not mean that they believe they are able to do so. Similarly, other people's wish to reduce uncertainty by means of piecemeal processes does not imply that they expect themselves to be able to do so. In other words, according to Bar-Tal, AACS moderates the NCS-cognitive structuring relationship. For high-AACS individuals, low NCS will probably be associated with an

individuating process, while high NCS will be associated with CS. In contrast, for low-AACS people, low NCS implies that they do not expect themselves to be able to achieve certainty using piecemeal processing. Therefore they will revert to low piecemeal, effortless processing. This postulate is consistent with the suggestion by Chaiken, Giner-Sorolla, and Chen (1996) that when systematic processing is difficult or impossible, an accuracy-motivated person may have no choice but to base their decision on the best rule of thumb available. Bar-Tal furthermore suggested that for low AACS individuals, high NCS is associated with lower cognitive structuring. Bar-Tal (1994a,b) suggested that this behaviour pattern stems from these people's wish to reach an unqualified decision (high NCS), and their perceived inability to achieve the desired certainty by means of CS. Note that while low-AACS/high-NCS individuals do not use cognitive structuring to achieve certainty, this does not mean that they use high piecemeal. Bar-Tal et al. (1997) suggested that rather than vigilance, these individuals are characterized by hypervigilance.

Since its introduction, Bar-Tal and his colleagues have provided empirical evidence for the validity of the model in various areas related to CS. Thus, for example, stereotyping (Bar-Tal & Guinote, 2002; Kossowska & Bar-Tal, 2013); decision making (Bar-Tal, 1994a,b; Kossowska & Bar-Tal, 2013); use of confirmation bias (Bar-Tal, 2010; Bar-Tal & Kossowska, 2010; Bar-Tal et al., 1997); fundamentalism (Muluk & Sumaktoyo, 2010); recall of schema inconsistent and irrelevant information (Bar-Tal et al., 1997); and the use of cruder and more global categorization (Bar-Tal et al., 1997) all are explained by the interaction between NCS and AACS. Greater utilization of CS and reliance on schema are also evident in reliance on assimilation processes rather than accommodation: greater reliance on existing cognitive structures, such as attitudes and personality traits, than on information from the environment. Along these lines, Bar-Tal and Jarymowicz (2010) demonstrated that higher use of CS was associated with the greater effect of trait anxiety on psychological distress among first-degree relatives of individuals hospitalized in cardiac intensive care.

We think that CS may also offer a valuable framework for investigation of the placebo phenomenon. Specifically, we postulate that the placebo effect is a manifestation of acceptance of the information that a given substance or treatment (placebo) has a given effect. This also implies a relative non-reliance on existing feelings, thoughts and beliefs (i.e. existing cognitive structures). That is, information related to the placebo has a stronger effect on people who use less cognitive structuring. If this is the case, then response to a placebo is moderated by the interaction between the individual's level of NCS and AACS. Specifically, it is predicted that for high AACS individuals, a higher NCS will be associated with weaker placebo effect (because of their tendency to utilize existing schema to a greater degree in forming conclusions). In contrast, for low AACS individuals, higher NCS will be associated with stronger placebo effect (lower filtering of incoming information and lower reliance on existing cognitive structures).

To test our assumptions we decided to conduct a study in which the experimental condition consisted on providing a placebo to participants with the information that this "medicine" improves mood and well-being. Participants were told that the research was an examination of individual differences in responsiveness to the medicine. Consequently, they could not be surprised that they were asked to fill in questionnaires measuring cognitive structuring and depression symptoms.

1. Method

1.1. Participants

The participants were healthy university students, 393 women and 70 men from the Lower Silesia University Wroclaw, Wroclaw Technical University, Higher School of Banking and Wroclaw University (Poland), Sport Academy in Wroclaw, University of Opole. They volunteered for an experiment entitled "Natural drug ABRAZEX and improvement of

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