CHAPTER SEVEN

The Application of Persuasion Theory to Placebo Effects

Andrew L. Geers*,[1], Pablo Briñol[†], Erin A. Vogel[‡], Olivia Aspiras*, Fawn C. Caplandies*, Richard E. Petty[§]

*University of Toledo, Toledo, OH, United States
[†]Universidad Autónoma de Madrid, Madrid, Spain
[‡]University of California, San Francisco, San Francisco, CA, United States
[§]Ohio State University, Columbus, OH, United States
[1]Corresponding author: e-mail address: andrew.geers@utoledo.edu

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Abstract

Placebo effects, or positive outcomes resulting from expectations about a treatment, are powerful components of modern medical care. In this chapter, we suggest that our understanding of placebo effects may benefit from more explicitly connecting this phenomenon to the existing empirical psychological literature on persuasion. Persuasion typically involves an attempt to bring about a change in beliefs or attitudes as a result of providing information on a topic. We begin by providing a brief overview of the psychological literature on placebo effects. We then point to connections between this literature and research on persuasive communication. Although some links have been made, these initial connections have predominantly relied on classic theories of persuasion rather than on more contemporary and comprehensive models. Next, we describe a modern theory of persuasion that may facilitate the study of placebo effects and analyze two issues pertinent to the literature on placebo effects from the lens of this model. Specifically, we consider how and when characteristics of a practitioner (e.g., variables such as perceptions of a practitioner's confidence or competence) can influence the magnitude of placebo effects, and how modern persuasion theory can help in understanding the durability of placebo effects over time. We conclude that examining placebo effects as an outcome of persuasive communication would be a fruitful line of future research.

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The placebo effect concept evolved during the prescientific era of medicine as a term for positive subjective changes resulting from the administration of inert medical treatments to patients (Shapiro & Shapiro, 1997). Early discussion of this concept generally considered placebos useful for placating patients but not for producing medically relevant change. In the middle of the 20th century, it became scientific practice to administer placebo treatments to participants in randomized controlled trials as a methodological safeguard against bias (De Craen, Kaptchuk, Tijssen, & Kleijnen, 1999). Following the emergence of this practice, the term placebo effect became synonymous with nuisance variance that needed to be extracted from clinical trials to validate genuine medical treatments. In these early perspectives, placebo effects were viewed as a form of unwanted psychological bias evoked by inert treatments. The notion that placebo effects could be incorporated in clinical care was considered unethical and inconsistent with a scientifically derived biomedical model of health care, which focused on uncovering physiological mechanisms uncontaminated by the subjectivity of the mind (Miller & Kaptchuk, 2008).

In contrast, a contemporary view is that placebo effects in healing are not artifacts of the past and are not simply psychological bias. There is substantial evidence that the success of many modern drugs and therapies benefits from placebo effects (Benedetti, 2014; Colloca, Flaten, & Meissner, 2013; Kirsch, 1999). Further, over the past two decades, a rigorous empirical literature has evolved demonstrating placebo effects across many medical domains, types of treatments, and outcomes. Based on this emerging literature, placebo effects are being reconceptualized as complex, beneficial, and scientifically measurable changes that are a direct result of the treatment administration process (Colagiuri, Schenk, Kessler, Dorsey, & Colloca, 2015; Colloca & Benedetti, 2005). Researchers now view placebo effects as an important, and potentially mutable, component of medical care and are searching for techniques that can enhance them (Enck, Bingel, Schedlowski, & Rief, 2013).

Although the value of placebo effects in medicine is gaining recognition, much about this phenomenon has yet to be explained and conceptualized. In this chapter, we suggest that an understanding of placebo effects can be improved by more explicitly connecting this phenomenon to the existing empirical literature on persuasion. That is, in many respects, placebo effects can be conceptualized as a consequence of persuasive communication. Unlike *compliance* and other forms of influence that typically involve a situation in which a behavioral response is sought in response to a request to do something, *persuasion* typically involves an attempt to bring about a change

in beliefs or attitudes as a result of providing information on a topic (e.g., delivering a message on the benefits of a new exercise routine; Briñol & Petty, 2012). The connection between persuasive communication and placebo effects is apparent in the exemplar case of prescribing placebos in medical care, when a practitioner prescribes an inert treatment with the suggestion of benefits to a patient. Here, we see the four central elements of the persuasive communication process (McGuire, 1969) at play: the message factor (i.e., suggested benefits of treatment), the source factor (i.e., medical practitioner), the recipient factor (i.e., the patient), and the context in which persuasion takes place (i.e., a medical office). Even in less prototypical examples, such as when a consumer selects a pain reliever at a drug store, many of the key elements of persuasion remain. For example, the store-bought drug will have packaging features that suggest the effectiveness of the treatment (i.e., message factor) and aspects of the consumer, such as mood and personality, can also influence how that message is evaluated (i.e., recipient factor).

Importantly, each of the four classic elements of persuasive communication (McGuire, 1969) has received attention in the literature on placebo effects. For example, researchers have found that variations in the characteristics or descriptions of the treatment can change the magnitude of placebo effects. These features include the color, size, taste, and cost of a drug (e.g., De Craen, Roos, De Vries, & Kleijnen, 1996; Moerman, 2002; Wright, da Costa Hernandez, Sundar, Dinsmore, & Kardes, 2013). Similarly, differences in the characteristics of the medical practitioner, the source of the treatment message, are also important determinants of placebo effects (Howe, Goyer, & Crum, 2017; Kaptchuk et al., 2008). Although research has shown that placebo effects vary based on the characteristics of the treatment message, source recipient, and context, these studies are generally considered in isolation and have not been integrated into a single organizational theoretical perspective. Considering these characteristics as elements involved in the process of persuasive communication would allow researchers to connect this work to established theories and principles that have been generated from decades of research on the psychology of persuasion. Further, through this integration, it may be possible to better understand the psychological processes by which variables, such as characteristics of a doctor, influence placebo effects (Geers & Miller, 2014).

In this chapter, we provide a brief review of the literature on the psychology of placebo effects. Next, we describe connections between this literature and persuasive communication. To illustrate the potential benefits of considering placebo effects from the vantage point of persuasion, we then

explain a modern and influential theory of persuasion, the elaboration likelihood model (ELM; Petty & Briñol, 2012; Petty & Cacioppo, 1986). By focusing on the fundamental psychological mechanisms underlying persuasion, the ELM has served to organize the many different theories, outcomes, and variables relevant to persuasion across diverse domains. In this regard, the ELM provides a potent theoretical platform for understanding a variety of aspects of placebo effects. Further, models such as the ELM afford predictions regarding additional facets of placebo effects, such as their directionality, durability, and likelihood of altering subsequent behaviors. After describing this model that has guided much of the persuasion research in the last decades (Petty & Briñol, 2012; Petty & Cacioppo, 1986), we present several examples to illustrate possible ways in which the ELM could enhance our understanding of findings in the placebo effect literature.

1. RESEARCH ON PLACEBO EFFECTS

Placebo effects are the result of psychobiological processes that are activated during the treatment context and can be separated from the physical properties of the treatment itself (Colloca & Benedetti, 2005). Self-fulfilling expectations and classical conditioning are the primary psychological mechanisms for placebo effects that have been examined thus far. In terms of expectations, placebo effects appear to be driven by an individual's belief that receiving a treatment will result in a particular response or outcome (Kirsch, 1999). When considering classical conditioning, placebo effects can be conditioned responses to a treatment, with active medications as the unconditioned stimuli, and the methods or techniques used to administer or accompany treatments as the conditioned stimuli (Stewart-Williams & Podd, 2004).

A standard procedure to experimentally test for placebo effects is to alter a treatment efficacy message given to one group of participants (e.g., this pill will reduce your pain) and then compare the responses of this group to those of another group not given this efficacy message. To isolate the impact of this expectation of outcome manipulation on treatment effects, inert treatments are typically administered to all participants. Studies of this kind offer evidence that the treatment message provided to patients is central in determining the illness experience and the symptomatic expressions of disease (Benedetti, 2014; Colloca et al., 2013; Kirsch, 1999). Placebo effects have been found across cultures, age groups, and with samples ranging from healthy children to those with severe health conditions, such as neuropathic

pain patients (e.g., Petersen et al., 2012; Weimer et al., 2013; Zimba, 1993). Placebo effects can cause clinically significant effects and in some cases the benefits appear comparable to those provided by standard treatments, most notably in the domains of pain relief and depression (Benedetti, 2014; Colloca et al., 2013).

Changes induced by placebo manipulations have been observed on a wide variety of assessment tools. Placebo effects can manifest on subjective measures of pain, depression, mood, headache, self-esteem, anxiety, relaxation, sleep quality, confidence in memory, and drug cravings (e.g., Caplandies, Colagiuri, Helfer, & Geers, 2017; Greenwald, Spangenberg, Pratkanis, & Eskenazi, 1991; Mills, Boakes, & Colagiuri, 2016). Placebo effects have also been exhibited on measures of cognitive processing such as reaction time, word generation, recall, recognition, Stroop interference, attention, and implicit learning (e.g., Colagiuri, Livesey, & Harris, 2011; Draganich & Erdal, 2014; Slama, Caspar, Gevers, & Cleeremans, 2013; Weger & Loughnan, 2013). Placebo effects can also occur on behavioral measures, including pain tolerance, completion of puzzle tasks, reduced sleep latency, approach of snakes and electric shocks, amount of alcohol consumed, talking time by socially anxious individuals, speed and endurance in aerobic athletes, weightlifting by competitive lifters, and motor performance in patients with Parkinson's disease (e.g., Benedetti et al., 2003; Fillmore & Vogel-Sprott, 1992; Shiv, Carmon, & Ariely, 2005). Placebo treatments may also influence subsequent decisions and actions, such as later purchasing behavior, number of cigarettes smoked, acts of aggression, and reductions in opioid analgesics used by pain patients (e.g., Berkowitz & Thome, 1987; Doering & Rief, 2012). Further, placebo manipulations have altered physiological parameters including blood pressure, pulse rate, sexual arousal, heart rate variability, salivary cortisol, startle eyeblink reflex, electrodermal activity, beta-band frequency during sleep, and bronchoconstriction in asthmatics (e.g., Benedetti, 2014; Darragh, Vanderboor, Booth, Sollers, & Consedine, 2015). Finally, there is also now strong neurobiological evidence linking placebo effects to complex mechanisms in the brain and spinal cord, indicating that the effects are not just the result of subjective biases (for a review, see Wager & Atlas, 2015).

Important for the present context, many psychosocial variables moderate placebo effects and these variables can be grouped into the four central elements of the persuasive communication process noted earlier: the message, source, recipient, and context. As previously noted, many features of the treatment message alter the magnitude of placebo effects, including

the color of a pill, the size of a pill, the taste of a pill, the intrusiveness of the administration induction, and the cost of a drug. Moreover, a variety of studies indicate that more "impressive" medical administration procedures (e.g., injections, acupuncture) tend to yield stronger placebo effects than less impressive procedures (e.g., oral placebos; Brunoni, Lopes, Kaptchuk, & Fregni, 2009; de Craen, Tijssen, de Gans, & Kleijnen, 2000; Kaptchuk et al., 2006; Linde, Niemann, & Meissner, 2010). As another illustration, consider a series of experiments by Shiv et al. (2005). In three different studies, these researchers manipulated the cost of a sham energy drink that was purported to increase mental acuity. Across all studies, participants who paid more for the placebo energy drink performed better on a subsequent series of puzzle tasks than those who paid less. Similar moderating effects have been found with the other three elements of persuasive communication (e.g., Geers et al., 2013). Thus, variations in the four elements of persuasion alter the strength of placebo effects.

It should also be noted that expectations for treatment outcomes can be negative as well as positive. Nocebo effects refer to negatively valenced placebo effects that result from the anticipation of unpleasant treatment outcomes or side effects. The term nocebo was coined by Kennedy (1961) and early on was discussed in relation to sociocultural reports of voodoo death. As with placebo effects, contemporary research finds nocebo effects across symptom domains and in both clinical and experimental studies (Colloca, 2017), and the effects are altered by communication factors such as whether the treatment is presented as name brand or generic (Faasse, Cundy, Gamble, & Petrie, 2013). Although nocebo and placebo effects may involve some distinct features, nocebo effects can be considered a variant of the broader placebo effect phenomenon. Keeping with this perspective, much of what is discussed herein pertains to both placebo and nocebo effects.

Finally, it should be noted that placebo effects are not restricted to the administration of inactive treatments. Rather, expectations regarding treatment efficacy can alter the efficacy of *active* treatments as well (Colloca, Lopiano, Lanotte, & Benedetti, 2004). For example, studies employing the balanced placebo design experimentally cross treatment expectation manipulations (e.g., explicitly stating whether a capsule contains caffeine or not) with active treatment manipulations (e.g., administering caffeine pills or not). Many studies using this design find that treatment expectations can independently increase the success of active treatments (see Dinnerstein & Halm, 1970; Hull & Bond, 1986). These findings reinforce the notion that

the processes responsible for placebo effects do not only impact the outcomes of inert treatments. Rather, these processes are at play with active treatments as well, and placebo effects can be construed as a component of virtually any treatment effect. From this perspective, placebo effect research has implications for health treatments and interventions that have both strong and weak effects.

Although the research literature on placebo effects has uncovered many important findings, much remains unknown. For instance, in studies where placebo effects arise, the effect sizes can vary substantially (Petersen et al., 2014; Vase, Petersen, Riley, & Price, 2009), and in some cases expectation manipulations produce result that are in contrast to the expectation (Ross & Olson, 1981). For example, Storms and Nisbett (1970) found that insomniacs actually fell asleep faster when they were given a placebo pill that purportedly increased arousal, as compared to insomniacs not given a placebo pill. Further, little is currently known about the persistence of placebo effects over time, and there is much still unknown regarding the psychological processes involved in placebo effects (Geers & Miller, 2014). In particular, in many reports, the discussion of psychological processes begins and ends by evoking the mechanisms of expectations or conditioning. We suggest that existing research on persuasive communication may be able to reconcile what otherwise might look like conflicting findings in placebo research and offer greater insight into the psychological variables involved in these effects.

2. PLACEBO EFFECTS AND PERSUASIVE COMMUNICATION

Messages pertaining to treatment efficacy (e.g., this drug will reduce your pain) are a ubiquitous feature of standard health care. Treatment efficacy messages can be conveyed either verbally (e.g., from a clinical provider) or nonverbally (e.g., print packaging material, online advertisements, social observation). Like other messages, treatment efficacy messages are, in essence, persuasive communications. These messages can change recipients' beliefs about treatment efficacy or evaluations of treatments, which, in turn, can cause placebo effects. As such, to understand how and when treatment messages result in placebo effects, it is valuable to understand the processes of persuasion leading to belief and evaluation change.

It is important to note that, in the present context, the term persuasion does not imply an extensive or deliberate attempt at changing views. That is, when we refer to persuasion, we are not contending that placebo effects

manifest only when medical practitioners deliberatively and actively try to change patient responses. Rather, persuasion is used here as a broad term for communication variables and processes that govern belief, attitude, and behavioral change (Petty & Briñol, 2012). Thus, the variables involved in persuasion can be complex or simple, consciously or nonconsciously perceived, relevant or irrelevant to an individual's current concerns, and deliberatively or unintentionally applied to modify evaluations and beliefs. It is theorized here that changes in these evaluations and beliefs can lead to corresponding changes in placebo effects.

Notably, this is not the first instance in which principles of persuasion have been proposed to help explain placebo effects. For example, Kirsch (1999) suggests that hypnosis and placebo effects result from the same underlying mechanism—expectations. Further, Wickless and Kirsch (1989) surmised that the expectation responsible for both hypnosis and placebo effects results from verbal persuasion and direct experience. In their research, Wickless and Kirsch found evidence that hypnotizability was increased by a verbal persuasive message as well as direct experience, which can be considered another type of persuasion—self-generated persuasion.

Another connection was made by Frank (1961) in his influential book, *Persuasion and Healing*. Frank posited that most therapies share similar ritualistic elements that serve to enhance the well-being of patients by providing hope and relief from distress. Furthermore, Frank surmised that the beneficial effects of treatments, such as psychotherapy, can result from the ceremonial actions and features of the clinical encounter that serve as persuasive influences. These influences were thought to improve patient outcomes through placebo effects. In this account, a single variable (e.g., wearing a white lab coat) is viewed as leading to greater persuasion (e.g., positive attitude toward healing). This approach is similar to early empirical approaches to the study of persuasion, which postulated a unidirectional effect of one variable on a given outcome (see Petty & Briñol, 2012). According to this main effect view, any one variable (e.g., source expertise, emotional state of the recipient) is likely to have just one effect on persuasion—either enhancing or reducing it.

A third link between placebo effects and the persuasion literature was drawn by Liberman (1962), who relied upon the "Yale" approach. The Yale approach was one of the earliest and most influential general theories of persuasion in the modern era and was based on learning theory principles (Hovland, Janis, & Kelley, 1953). This approach held that anything that facilitated attending to, comprehending, and learning the contents of a

persuasive message would be beneficial for attitude change, and anything that would disrupt those learning processes would be detrimental. For example, distracting someone from the message was predicted to reduce persuasion because it would interfere with learning. Similarly, providing a person with a credible source would increase persuasion because it would motivate people to learn the message (see Petty & Cacioppo, 1986, for a review).

When applied to placebo effects, these early accounts may suggest, for example, that a doctor with higher confidence should always obtain placebo effects of a greater magnitude than less confident doctors, due to enhanced patient learning (i.e., people would attend more to a confident doctor and thus learn more). Although single effect and single process assumptions of this kind have merits and were useful for early studies of persuasion, extensive research has revealed important limitations. For instance, it has been shown that any one variable (e.g., an expert confident source, a positive mood of the recipient) can increase persuasion in some instances but reduce it in others (for a discussion, see Briñol & Petty, 2012), and learning is not the only (or even the most important) mechanism of persuasion. Moreover, attitude changes are sometimes relatively durable and impactful (e.g., when they guide behavior) but other times rather transitory and inconsequential. Finally, research reveals that persuasion is not always the result of the same psychological mechanism, but rather many different mechanisms can be responsible for attitude change and these mechanisms can have different short- and long-term outcomes. Because of these and other challenges, modern theories of persuasion have become more complex and have been specifically devised to account for multiple effects, processes, and consequences.

3. MODERN MODELS OF PERSUASION

In the 1970s, evidence mounted that even seemingly simple psychological variables such as expert sources or positive moods could produce multiple and opposite effects, and that multiple processes could underlie these diverse outcomes. As a result, the 1980s saw the emergence of several multifaceted theories in social psychology designed to accommodate these disparate findings. In the persuasion literature specifically, the ELM (Petty & Briñol, 2012, 2014; Petty & Cacioppo, 1986) and the heuristic-systematic model (HSM; Chaiken, Liberman, & Eagly, 1989) advanced and articulated multiple processes by which variables could affect evaluative judgments in different situations.

Next, we outline one of these contemporary persuasion models, the ELM. In the present context, is it notable that the ELM was forged in response to inconsistencies in the attitude change literature. Beyond understanding change about issues and objects, the ELM has proven to be broadly applicable and has been able to accommodate virtually any change in judgment caused by social and contextual factors, including internal evaluations such as self-worth judgments (self-esteem), changes in personal identity, and changes in mood and affect (see Wegener & Petty, 1996). Our focus here is on how persuasion processes can explain changes in the evaluative judgments pertaining to symptomology that underlie placebo effects. A central idea is that when treatment messages are evaluated more favorably (i.e., the persuasion is more effective), placebo effects will be stronger.

4. MAIN POSTULATES OF THE ELM

In this section, we describe the main postulates of the ELM. For additional and more detailed descriptions, see Petty and Cacioppo (1986), Petty and Briñol (2012, 2014).

First, according to the ELM, evaluations can change through a high degree of thought or a relatively low degree of thought. That is, persuasion occurs along an "elaboration continuum" that ranges from low (investing little thought in the persuasive message) to high (investing a great deal of thought in the persuasive message). Notably, the ELM holds that there are numerous specific processes of change that operate along this continuum. For example, mental heuristics (e.g., "there are many arguments so it must be good") require relatively little thought, and therefore operate at the low end of the continuum. Alternatively, deliberative attributions and expectancy-value assessments (e.g., evaluating each argument for its merit rather than counting them) tend to require higher degrees of thought and thus operate at the higher end of the continuum. Low-elaboration processes are collectively referred to as following the *peripheral route* to persuasion, whereas high-elaboration processes are collectively referred to as following the *central route* to persuasion.

The ELM also postulates that whether people engage in the peripheral or the central route to persuasion depends on their ability and motivation to think in the context in which persuasion occurs. For instance, distractions, rapid speech, and little domain knowledge can undermine one's ability to think about a message (Petty & Cacioppo, 1986). Other variables, such as message repetition, general intelligence, and high message clarity, can aid

one's ability to process a message. Whether the peripheral or central route is used also depends on the perceiver's motivation to process the message. Perhaps the greatest determinant of motivation is the perceived *personal relevance* of the information. When the personal relevance of a message is perceived to be high, individuals scrutinize the evidence more carefully such that if the evidence is found to be strong, more evaluative change results, but if the evidence is found to be weak, less evaluative change occurs (Petty & Cacioppo, 1979). Conversely, when motivation to think is low, individuals are less influenced by argument quality and more influenced by simple cues in the message that take less cognitive effort to process, such as the length of the message and whether a message is endorsed by an attractive or unattractive source.

In one prototypical early study of the ELM illustrating this point, Petty, Cacioppo, and Schumann (1983) varied participants' interest in an advertisement for the "Edge razor" by informing them that they would select from brands of razors (high relevance) or brands of toothpaste (low relevance) as compensation for participating in the study. Subsequently, participants were exposed to a razor advertisement containing either strong (e.g., "In direct comparison tests, the Edge blade gave twice as many close shaves as its nearest competitor") or weak (e.g., "In direct comparison tests, the Edge blade gave no more nicks or cuts than its competition") arguments that were presented by a famous celebrity or an ordinary citizen. Petty and colleagues found larger argument quality effects (i.e., more persuasion for the strong than weak arguments) when the razor advertisement was high as opposed to low in personal relevance but a larger impact of the celebrity endorser when the ad was low as opposed to high in personal relevance. This and other studies have supported the ELM proposal that high and low thinking individuals follow different routes to persuasion.

In the context of placebo effects, many variables could determine whether the peripheral or central route is followed. For example, fear and anxiety could undermine a patient's ability to evaluate a treatment efficacy message, and involvement in treatment decision-making may increase interest in a treatment and raise motivation (e.g., Geers et al., 2013).

Next, the ELM postulates that the route to persuasion determines how consequential the evaluation change is. Specifically, evaluations made through the central route of effortful information processing tend to persist over time, resist attempts at change, and have consequences for other judgments and behavior (Petty, Haugtvedt, & Smith, 1995). This postulate is referred to as the elaboration—strength hypothesis.

As an illustration of this hypothesis, consider how the extent of elaboration can be applied to understanding long-term changes from psychotherapy interventions. In one experiment targeting poor body image, Gascó, Briñol, and Horcajo (2010) changed participants' self-evaluations through a persuasive procedure involving high elaboration (self-persuasion) or through a less engaging procedure involving low elaboration (passive exposure; cf. Janis & King, 1954). Participants in the high-elaboration condition were requested to actively generate reasons why they liked their bodies, whereas those in the low-elaboration condition simply read positive affirmations taken from a program on eating disorders (Rosen, 1997). As expected, participants in both the high- and low-elaboration groups showed more favorable attitudes toward their bodies than those in the control group. More interestingly, although the treatments were equally effective in changing attitudes, the strength associated with those attitudes was significantly different depending on the amount of thinking involved in the process of change. Specifically, attitudes were stronger in the high-elaboration condition than low. Participants in the high-elaboration condition perceived their attitudes to be more valid and more resistant to change than those in the low-elaboration condition. In other words, the treatment had a stronger effect at higher levels of thought. In line with the elaboration-strength hypothesis, it could be surmised that placebo expectations formed through higher levels of elaboration should last longer, be more resistant to change, and guide behavior more than those formed through lower levels of elaboration.

In addition to elaboration, the ELM incorporates another key process called *validation* (Petty, Briñol, & Tormala, 2002). Unlike the mechanisms of change described thus far, which focus on primary or first-order cognition (i.e., amount and direction of thoughts), validation emphasizes secondary or metacognition (i.e., thoughts about our own thoughts). The key notion of validation is that simply generating thoughts is not sufficient for the thoughts to impact judgment. Rather, one must also have sufficient confidence in one's thoughts (cognitive validation) or feel sufficiently good about them (affective validation) for the thoughts to have an impact. Thoughts that are not perceived as valid or that are disliked are mentally discarded.

In an initial set of studies, Petty et al. (2002) provided evidence for a causal link between thought confidence and judgment. In one study, participants were exposed to a message containing very strong arguments (pretested to elicit positive thoughts) or very weak arguments (pretested to elicit mostly negative thoughts) in favor of a campus proposal. Following

the message, participants listed their thoughts about the proposal and were then asked to think about past situations in which they experienced confidence or doubt. Those who articulated past instances of confidence became more certain of the validity of their recently generated thoughts to the message compared to those who reflected upon instances of doubt. That is, the feeling of confidence stemming from the randomly assigned memory exercise was misattributed to the thoughts recently generated regarding the persuasive message. This differential thought confidence then polarized attitudes toward the proposal, such that exposure to strong arguments led to very positive attitudes and exposure to weak arguments resulted in very negative attitudes.

There are many aspects of the source (e.g., similarity, status), the message (e.g., matching, quality), the recipient (e.g., bodily responses, emotions), and the situation (e.g., consensus) that can influence the extent of validation following the generation of message-relevant thoughts (Briñol & Petty, 2009a). As an illustration, consider a study by Brinol, Petty, Valle, Rucker, and Becerra (2007). They presented participants with either strong or weak arguments in favor of a proposal advocating for mandatory vaccination. This manipulation of argument quality prompted participants to generate either mostly positive (i.e., when arguments were strong) or mostly negative (i.e., when arguments were weak) thoughts about the new proposal. After participants generated their thoughts about the arguments, but before providing their attitudes toward the vaccination idea, they were instructed to recall either two incidents in their lives in which they had power over another person (high-power condition), or in which someone else had power over them (low-power condition). Relative to the low-power condition, those induced to feel powerful reported greater confidence in their thoughts about the mandatory vaccination. Presumably, they experienced strong feelings of confidence from the power manipulation, and they misattributed that confidence to their thoughts about the message. Consistent with validation, attitudes were polarized in the direction of the thoughts generated when power was high as compared to low. Therefore, generating message-relevant thoughts increased persuasion for strong arguments and decreased persuasion for weak arguments when participants experienced validation (i.e., feelings of confidence). This research illustrates that people may not only need to have the right expectations for placebo effects to work, but also need to have enough confidence and liking regarding their thoughts about the placebo to translate them into relevant judgments and actions.

In sum, the self-validation logic suggests that people often look for ways to validate whatever mental contents have been activated, including both positive and negative treatment expectations. Importantly, increasing perceived validity in positive (placebo) expectations will increase placebo effects, whereas increasing perceived validity in negative (nocebo) expectations will increase nocebo effects. Therefore, researchers and practitioners need to consider not only the direction of the expectations but also the validity associated with them.

5. MULTIPLE PROCESSES: BEYOND ELABORATION AND VALIDATION

A valuable element of the ELM is that it organizes the many specific processes by which variables (e.g., personality factors, the expertise of the communicator, current mood state) affect evaluative judgments into a finite set of five processes that operate at different points along the elaboration continuum (for a discussion, see Petty & Briñol, 2014). For example, the ELM postulates that variables such as the attractiveness of the source of a message can affect how much a person thinks about the message, thereby altering their location along the elaboration continuum. However, if circumstances have already conspired to place the person at the low end of the thinking continuum, then the variable can serve as a simple cue, affecting judgments in a direction that is consistent with its valence (e.g., an attractive source would lead to positive persuasion outcomes). On the other hand, if the person is at the high end of the continuum, the variable can affect judgments through one of three more deliberative processes. Specifically, the variable can be examined as an argument (e.g., does the fact that the source is attractive provide some relevant evidence about the merit of what he/she is advocating?), the variable can affect the valence of the thoughts that come to mind (e.g., exposure to an attractive source can make positive thoughts more salient and motivate positive thinking), and the variable can affect a structural feature of the thoughts generated (e.g., an attractive source could make one's thoughts more likeable or held with greater confidence).

The influence of all communications variables (source, message, recipient, and context) can operate through any of these five processes depending on the circumstances. Thus, the ELM describes five different roles that communication variables can have in altering persuasion: variables can (1) serve

as simple cues (peripheral route), (2) alter one's location on the elaboration likelihood continuum (determining whether the peripheral or central route operates), (3) be examined as an argument (central route), (4) affect the valence of the thoughts that come to mind (central route), and (5) affect the metacognitive confidence and the liking toward the thoughts generated (central route).

In terms of placebo effects, this multiprocess perspective can help to clarify when a placebo effect is most likely to arise and which type of process is likely responsible. To illustrate this, consider the use of attractive, expensive-looking packaging for a new pain medication. The general finding could be that the attractive cover of the placebo treatment reduces pain to a greater extent compared to an unattractive container. But what is the process by which this effect occurs? The ELM postulates how high- vs low-elaboration processes may alter treatment outcomes, as well as indicating the conditions under which the different processes should manifest. For example, the attractive packaging could serve as a peripheral cue that associates the treatment with positive feelings (simple learning effect) or the attractive packaging could lead to a simple expectation that "if it looks good it is bound to work." At higher levels of elaboration, more thoughtful processes are anticipated to underlie apparently equivalent placebo effects. For example, when an individual is actively reflecting on the treatment, the attractive packaging could increase the positivity of the thoughts generated with regard to the treatment and even increase the confidence and liking associated with those thoughts. In turn, these favorable thoughts held with validity could lead to stronger treatment efficacy expectations, and promote strong and long-lasting placebo effects.

6. THE ELM AND PLACEBO EFFECTS

With the ELM outlined, we now revisit the placebo effect phenomenon. As may be readily apparent from the explanation of the ELM, the model provides a rich and diverse lens from which to study and understand placebo effects. In this section, we focus on two illustrative questions that arise from the placebo effect literature and provide answers for them drawn from the ELM. First, we discuss how the ELM could be used to explain when and how characteristics of a practitioner can alter placebo effects. Second, we discuss how the ELM can help to explain the duration of placebo effects.

7. WHEN AND WHY DO CHARACTERISTICS OF A PROVIDER ALTER PLACEBO EFFECTS?

As expectations for treatment success are typically induced by another person (e.g., a healthcare provider), there has been great interest in the possibility that the therapeutic encounter and characteristics of a provider can trigger or modify placebo effects (e.g., Benedetti, 2013; Bensing & Verheul, 2010; Brody & Brody, 2000; Frank, 1961). Characteristics of the provider encompass a broad array of potentially placebogenic elements, including amount of communication, gestures and postures, facial expressions, eye gaze, tone of voice, touch, adherence to medical rituals, conversational rapport, and patient perceptions of physician empathy, confidence, competence, social power, and status (e.g., Di Blasi, Harkness, Ernst, Georgiou, & Kleijnen, 2001; Kaptchuk et al., 2008; Vase, Nørskov, Petersen, & Price, 2011).

A variety of evidence suggests that practitioner characteristics can alter placebo effects. For example, in a study by Kaptchuk et al. (2008), patients with irritable bowel syndrome were randomly assigned to a wait list group, a placebo acupuncture group, or a group that received placebo acupuncture with a supportive practitioner. The supportive practitioners were instructed to listen to participants and to be warm, confident, and thoughtful. The results revealed that participants with the supportive practitioner reported more improvement 3 weeks later than the other two groups. Although the findings of this experiment are in-line with the position that practitioner characteristics alter placebo effects, other factors also differed across conditions, including the amount of time spent with patients. More recently, Howe et al. (2017) directly manipulated practitioner warmth and competence and found that these specific characteristics of a practitioner can strengthen placebo effects.

Although aspects of the practitioner can alter placebo effects, studies examining attributes of the practitioner have not always found them to work (e.g., Di Blasi et al., 2001; Schnittker & Liang, 2006), raising questions about the conditions under which practitioner attributes (e.g., perceived confidence) manifest. Further, even in situations when aspects of the practitioner promote placebo effects, it remains unclear why these effects occur. Thus, much is still unknown about how and when practitioner characteristics alter placebo effects.

As previously noted, the ELM is useful in that it describes five different roles that communication variables can have in altering persuasion. This

multiprocess perspective can clarify when a factor, such as a provider characteristic, is likely to increase placebo effects and which type of psychological process is likely responsible. To illustrate this, consider the confidence of a doctor when they are presenting a placebo treatment for pain. The general finding could be that a placebo treatment reduces pain to a greater extent when the doctor is perceived as confident. But what is the process by which this effect occurs? As described earlier, the ELM postulates five processes that may influence treatment outcomes and the conditions under which they occur. For example, in low elaboration situations, the doctor's confidence could lead to the adoption of the simple heuristic that "if the doctor is confident, this treatment must work."

Importantly, displays of confidence are not always hypothesized to cause placebo effects through this sort of low effortful process. Instead, when individuals are able and motivated to engage in high levels of elaboration, more thoughtful processes are anticipated to underlie placebo effects. For example, the level of confidence could alter the valence of thoughts that comes to the patient's mind. That is, when the patient is engaged in higher levels of thought, they may actively reflect on the doctor's display of confidence. This confidence could increase thought positivity, which, in turn, could lead to stronger treatment efficacy expectations and subsequent placebo effects. Alternatively, if the doctor is perceived as expressing low levels of confidence, this could lead to the generation of negative thoughts, which could ultimately undercut a placebo effect.

As noted, under high elaboration conditions, other processes beyond biasing the direction of thoughts are possible. For example, the confidence expressed by the doctor can be misattributed to the thoughts generated by the patient, validating whatever comes to mind at the time. If thoughts are positive, increasing confidence will increase placebo effects, but if the patient's thoughts are negative, increasing confidence will decrease placebo effects. This metacognitive process of thought validation is more likely to operate not only when patients think about their thoughts but also when they consider validating information following (or during) thought generation.

When the level of thinking is moderate (rather than high or low) and the patient considers the doctor's confidence before processing the message, the doctor's confidence could affect the *extent* of thinking. Consider the case in which a patient is passively listening to a doctor explaining a medical treatment. The patient may be attending to the doctor, but also devoting some thought to other events (such as issues of payment for the medical visit).

If during this interaction the patient detects that the doctor is not very confident in the treatment, this could prompt an increase in thinking on the part of the patient. This increased thinking could reduce the effectiveness of the doctor's treatment efficacy message by high elaborative processes if the message is weak, but increase the persuasive effect if the message is strong. Of course, if the confidence of the doctor is distracting or is interpreted as a sign that everything is going well, making the patient feel pleasant and safe, then it can decrease (rather than increase) elaboration (see Briñol & Petty, 2009b, for a review on source factors in persuasion).

In sum, source characteristics—such as the confidence of a doctor—may enhance or undermine placebo effects through multiple processes depending on elaboration and timing conditions. Importantly, however, the long-term consequences of source characteristic variables are likely to differ depending on whether persuasion occurred with relatively high or low amounts of thinking. As we describe next, when patients experience placebo effects through high thinking, the placebo effects would be expected to be more durable and more likely to influence subsequent decisions and behavior.

8. WHEN AND WHY DO PLACEBO EFFECTS ENDURE OVER TIME?

One key question regarding placebo effects is, "how long do they last?" In medical care, this question has important implications. Some have suggested that placebo effects from expectations are likely to degrade quickly over time as compared to active treatment effects. However, there are a few examples in the empirical literature of placebo effects lingering for many weeks and even months. As much of the experimental literature on placebo effects comes from single session studies, this durability issue has not yet received a great deal of attention. Consequently, at present, there is an insufficient research base and theory from which to predict how and when treatment expectations lead to more long-lasting and durable placebo effects (Geers & Miller, 2014). Clarifying when placebo effects endure would have valuable implications for medical care.

As described earlier, the ELM proposes that the amount of elaboration embedded in the processes of change is consequential for short- and long-term change. Therefore, a valuable feature of the ELM approach to placebo effects is that the model leads to predictions regarding the longevity,

durability, and behavioral implications of placebo effects. Specifically, the model proposes that placebo effects brought about through high-elaboration processes should be more persistent, resistant, and predictive of behavior change than those brought about through of low-elaboration processes. Furthermore, placebo effects forged through high-elaboration processes should also be more accessible and held with greater confidence. In summary, based on the elaboration—strength hypothesis of the ELM, it can be surmised that placebo effects emerging from higher levels of thought should last longer than ones resulting from lower levels of thought. Moreover, placebo effects that result from high thinking should be more resistant to contrary internal information (e.g., physical sensations) and external information (e.g., social observations) that does not support a placebo expectation. Thus, the ELM provides a novel platform for testing the strength of placebo effects.

Do placebo effects formed through higher elaboration last longer than ones formed through lower levels of elaboration? Currently, there are no direct data relevant to this hypothesis. However, one recent experiment concerning the effect of expectations on postexercise feelings provides some suggestive evidence (Helfer, Elhai, & Geers, 2015). In this experiment, one group of participants was presented with information indicating that engaging in exercise results in positive mood states. A control group, in contrast, learned about the specific qualities of an exercise bicycle. Orthogonal to this expectation manipulation was an elaboration manipulation. Half of the participants were asked to further think about the information they were provided. Specifically, the high-elaboration participants were asked to write down personal examples that illustrate the idea that exercise improves mood. The low-elaboration participants did not engage in this additional writing. All participants then completed 10 min of light-intensity exercise on a stationary bicycle in the laboratory. Afterward, participants were given the opportunity to take part in a 2-week follow-up survey about exercising. The data revealed that participants who were told that exercising elevates mood states displayed a more positive mood state immediately after the exercise than the no-expectation participants, regardless of amount of elaboration. Thus, in the short-term, high and low elaboration resulted in similar immediate changes in feelings and thoughts (a placebo-like effect). However, at the 2-week follow-up, it was found that only the high-elaboration group reported a more positive mood state following exercise. Consistent with the ELM, the results indicate that greater message elaboration at the

time of the initial treatment evaluation increased the duration of the expectation message's effect on mood.

The research just described provides initial evidence that level of message elaboration can alter the duration of expectation effects on mood states. Future research should explore this prediction in standard placebo paradigms, ideally including physiological outcome measures. Further, it will be valuable to test other indicators of the elaboration-strength hypothesis. For example, based on the ELM, it can be predicted that when individuals elaborate on placebo expectations given with strong messages, they will be more likely to alter many other outcome variables such as purchasing behavior, treatment adherence, and making treatment recommendations to others. Additionally, placebo effects developed in this manner may be more resistant to internal physical cues and sensations that do not support the placebo effect.

9. SUMMARY AND CONCLUSIONS

In this chapter, we reviewed both the placebo and persuasion literature and suggested a new conceptualizing of placebo effects as consequences of persuasive communication. Placebo effects often arise when treatment-relevant information is transmitted from a source, in a specific context, and changes a recipient's responses. To illustrate the potential of this integration, we outlined a modern theoretical model of persuasion, the ELM, and suggested ways this model can link to the literature on placebo effects. From this account, placebo effects can occur through both high and low levels of mental elaboration, and motivation (e.g., personal relevance) and ability (e.g., distraction, knowledge) are critical determinants of the extent of elaboration. The model also emphasizes the role of thought confidence and thought liking as other critical factor that influence the development of placebo effects through metacognitive processes. Additionally, when placebo effects arise through high-elaboration processes, they are predicted to be more persistent, resistant, and directive of behavior than if they are brought about through low-elaboration processes. Our review also emphasized the metacognitive process of validation, which influences the use of the thoughts that determine placebo effects. A critical aspect of the ELM is that it identifies five different roles that any single communication variable can have in altering placebo effects. We believe that the ELM provides a theoretically rich framework for future research regarding the psychological processes underlying placebo effects.

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