The elaboration likelihood model: Review, critique and research agenda

Article *in* European Journal of Marketing · November 2014

DOI: 10.1108/EJM-12-2011-0776

CITATIONS
87

READS
22,529

5 authors, including:

Philip J. Kitchen
Rennes School of Business
205 PUBLICATIONS **5,716** CITATIONS
SEE PROFILE

Gayle Kerr
Queensland University of Technology
61 PUBLICATIONS **1,413** CITATIONS
SEE PROFILE

Rod Mccoll
Rennes School of Business
21 PUBLICATIONS **1,031** CITATIONS
SEE PROFILE

The elaboration likelihood model: review, critique and research agenda

Philip J. Kitchen
ESC Rennes School of Business, University of Rennes, Rennes, France
Gayle Kerr
Department of Advertising, Marketing and Public Relations, Queensland University of Technology, Brisbane, Australia
Don E. Schultz
Medill School of Journalism, Northwestern University, Evanston, Illinois, USA
Rod McColl
Department of Marketing and Strategy, ESC Rennes School of Business, Rennes, France, and
Heather Pals
Department of Law, University of Toronto, Toronto, Canada

Received 30 December 2011
Revised 24 September 2012
20 July 2013
2 January 2014
Accepted 24 January 2014

Abstract

Purpose – The purpose of this paper is to review, critique and develop a research agenda for the Elaboration Likelihood Model (ELM). The model was introduced by Petty and Cacioppo over three decades ago and has been modified, revised and extended. Given modern communication contexts, it is appropriate to question the model's validity and relevance.

Design/methodology/approach – The authors develop a conceptual approach, based on a fully comprehensive and extensive review and critique of ELM and its development since its inception.

Findings – This paper focuses on major issues concerning the ELM. These include model assumptions and its descriptive nature; continuum questions, multi-channel processing and mediating variables before turning to the need to replicate the ELM and to offer recommendations for its future development.

Research limitations/implications – This paper offers a series of questions in terms of research implications. These include whether ELM could or should be replicated, its extension, a greater conceptualization of argument quality, an explanation of movement along the continuum and between central and peripheral routes to persuasion, or to use new methodologies and technologies to help better understanding consume thinking and behaviour? All these relate to the current need to explore the relevance of ELM in a more modern context.

Practical implications – It is time to question the validity and relevance of the ELM. The diversity of on- and off-line media options and the variants of consumer choice raise significant issues.

Professor Kitchen would like to thank his Brock research assistant Heather Pals for her involvement at an early stage with the topic. The authors wish to thank the reviewers and editors alike for their wise counsel as the paper was developed.

European Journal of Marketing
Vol. 48 No. 11/12, 2014
pp. 2033-2050

0309-0566
DOI 10.1108/EJM-12-2011-0776

Originality/value – While the ELM model continues to be widely cited and taught as one of the major cornerstones of persuasion, questions are raised concerning its relevance and validity in 21st century communication contexts.

Keywords Persuasion, Advertising theory, Communications context, Elaboration likelihood, Multi-channel processing

Paper type Conceptual paper

Introduction

The Elaboration Likelihood Model (ELM) model was introduced to the academic literature by Petty and Cacioppo in 1981. Prior to its development, the field of persuasion and its impact on consumer attitude formation was characterized by conceptual ambiguities and methodological deficiencies despite the work associated with the dominant attitudinal model by Fishbein and Ajzen (1972), Ajzen and Fishbein (1980) and later Fishbein and Ajzen (2010). There seems little doubt that Petty and Cacioppo took these earlier works into consideration as recorded by Petty (2006) and in earlier papers prefacing the ELM (Petty and Cacioppo, 1979). It was equally clear that two distinct paths of thinking had emerged in the literature. These described the process of persuasion either as resulting from extensive consideration of issue-relevant arguments, or from the use of various heuristic cues (Petty *et al.*, 1983). Prior to the ELM, theories of persuasion did not offer a comprehensive way of understanding attitude change (Petty and Cacioppo, 1983). Petty and Cacioppo (1983) reasoned that a framework for persuasion that specified variables that would affect the likelihood of extensive cognitive activity and the resultant consequences of attitudinal change was mandated.

Undoubtedly, the major reason for continued use of the ELM is the enormous amount of literature, with more than 125 articles and chapters in the advertising and marketing literature since 1981 (Schumann *et al.*, 2012), plus enhancements and extensions that have been generated around the ELM (Kruglanski and Thompson, 1999). As a highly *influential* (Szczepanski, 2006), *valuable* (Karson and Korgaonkar, 2001) and *popular* framework (Morris *et al.*, 2005), the model is most often used by advertising researchers when studying attitudinal change, which is assumed to be the process by which externally generated persuasion occurs. This strong literature support can perhaps be explained by any of three reasons. First, the model is well-constructed and clearly and simply articulates the persuasion process. Second, the model is so descriptive that it can accommodate a number of different outcomes and hence can be used as support in many situations; and finally, that of academic precedent. The model is so well cited in new research that its inclusion is expected, anticipated and often required by journal editors and reviewers alike, representing one of marketing communication's sacred and most-cited models (Pasadeos *et al.*, 2008).

Despite its theoretical significance, doubts about the practical application of the ELM have been raised (Szczepanski, 2006) and further weaknesses have become evident over the years. While advertising practitioners and academics recognize the ELM's *post hoc* explanatory power, they continue to question its predictive abilities, advising caution when using it for advertising design and implementation (Szczepanski, 2006). Further, the ELM model was developed during the mass-media marketing communication days of the 1980s. Thus, if managers habitually use an ELM framework for planning, it is likely that they may be looking at the market through a 1980s lens and perhaps not receptive to new technological developments nor reactive to the digital landscape which

has empowered consumers (P.J. Kitchen, personal correspondence with Richard Petty, 2013; Kitchen, 2010; 2013). With these doubts in mind, the purpose of this paper is to provide an overview of the ELM model, a consideration of the literature in support and in critique of the model, and recommendations for further research.

Overview of the ELM

The ELM provides an organizing framework for persuasion that is argued to be applicable to various source, message, recipient and context variables (Petty and Cacioppo, 1986). The basic tenet of the ELM is the presence of two routes to persuasion: the central and peripheral routes. These are anchored at two opposite points on a continuum, which represents the likelihood of cognitive effort being expended to process a message (Schumann *et al.*, 2011). Depending on a person's motivation and ability, their elaboration likelihood will be either high or low, which will, in turn, determine the route through which persuasion may occur (Petty and Cacioppo, 1983; 1986). An individual's motivation can be affected by a variety of factors, including whether or not the message has personal relevance, the degree of need for cognition (NFC), the source of the message argument and whether the advocated position is pro- or counter-attitudinal situations. (Petty and Cacioppo, 1983). In addition to an individual's level of motivation, ability plays an important role in determining which route will be taken. Variables influencing a person's ability to process a message argument include the presence of distracting stimuli, message repetitiveness, complexity and the amount of issue-relevant prior experience the intended individuals have (Petty and Cacioppo, 1983). The effect of the persuasion process is typically measured by attitudinal and behavioural effect. The ELM model is illustrated in Figure 1.

The premise of ELM is that when elaboration likelihood is high, information processing will occur via the central route. Resultant attitude formation, change or endurance is derived from extensive consideration of the message arguments and will be more persistent (Haugtvedt and Petty, 1989) and predictive of an individual's subsequent behaviour (Petty and Cacioppo, 1983). When elaboration likelihood is low, processing occurs via the peripheral route. The peripheral route to persuasion requires little cognitive effort, instead relying upon peripheral cues such as source credibility and heuristics (Petty and Cacioppo, 1983). As such, attitudes formed via the peripheral route are relatively unaffected by argument quality, are temporary in nature, and are not as predictive of subsequent behaviour as those formed using the central route (Petty and Cacioppo, 1983).

Petty and Cacioppo (1981a, 1981b, 1983, 1986) identified a number of variables that mediate elaboration likelihood, thereby influencing whether the peripheral or central processing route will be taken. Such variables include source attractiveness, involvement and the NFC. Within the ELM framework, these variables can take multiple roles in specifiable conditions, acting as persuasive arguments, peripheral cues or affecting the extent or direction of argument elaboration (Petty *et al.*, 1987). Along with the multiple roles postulate, the ELM is based on six other postulates (Petty and Cacioppo, 1986; Table I). The proceeding review of ELM-related issues will explore some of the model's postulates, and shed light on a number of important developments pertaining to the ELM.

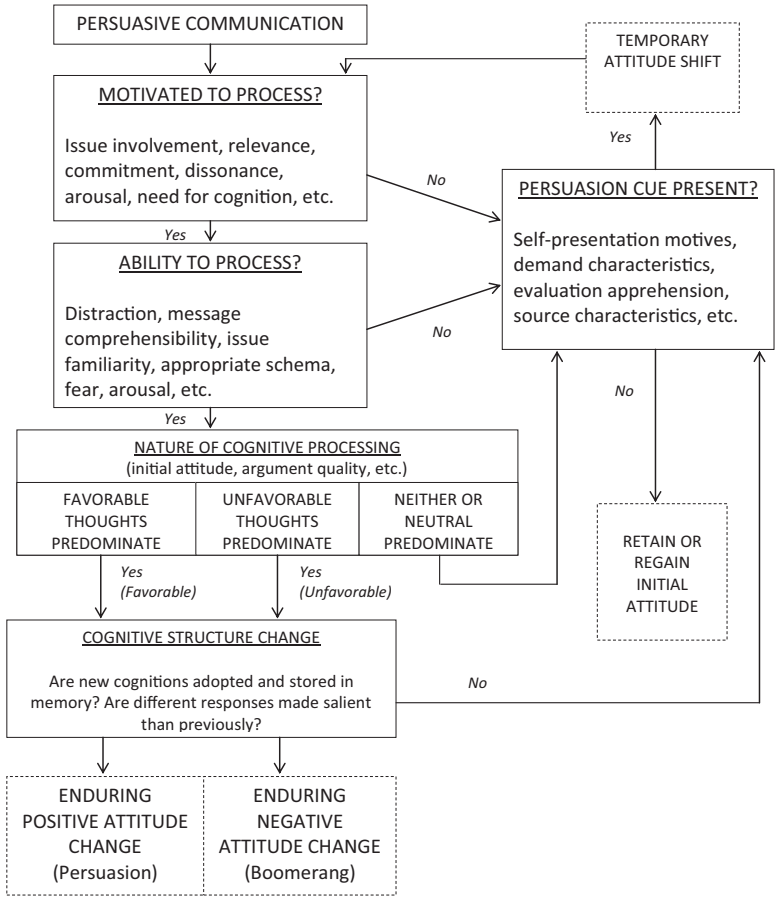

Figure 1.
The ELM of persuasion

Source: Petty & Cacioppo (1983, p. 6)

Issues concerning the ELM

Throughout its more than 30-year history, the ELM has been central to studies of consumer behaviour, and has been referred to as one of the most influential theories in marketing communication research (Szczepanski, 2006). Despite its popularity, the ELM has also received significant criticism in the literature. In particular, four major research areas have emerged surrounding the ELM:

(1) the descriptive nature of the model;

(2) continuum questions;

(3) the issue of multi-channel processing; and

(4) the analysis of the different variables which mediate elaboration likelihood.

The mediating variables of affect, involvement and cognitive responses have received the most attention in the literature (Kitchen, 2013).

Postulates of ELM	Description
Postulate 1: The correctness postulate	People are motivated to hold correct attitudes
Postulate 2: The elaboration continuum postulate	Although people want to hold correct attitudes, the amount and nature of issue relevant elaboration in which they are willing or able to engage to evaluate a message vary with individual and situational factors
Postulate 3: The multiple-roles postulate	Variables can affect the amount and direction of attitude change by: serving as persuasive arguments; serving as peripheral cues; and/or affecting the extent or direction of issue and argument elaboration
Postulate 4: The objective-processing postulate	Variables affecting motivation and/or ability to process a message in a relatively objective manner can do so by either enhancing or reducing argument scrutiny
Postulate 5: The biased processing postulate	Variables affecting message processing in a relatively biased manner can produce either a positive (favourable) or negative (unfavourable) motivational and/or ability bias to the issue-relevant thoughts attempted
Postulate 6: The trade-off postulate	As motivation and/or ability to process arguments is decreased, peripheral cues become relatively more important determinants of persuasion. Conversely, as argument scrutiny is increased, peripheral cues become relatively less important determinants of persuasion
Postulate 7: The attitude strength postulate	Attitude changes that result mostly from processing issue-relevant arguments (central route) will show greater temporal persistence, greater prediction of behaviour and greater resistance to counter-persuasion than attitude changes that result mostly from peripheral cues

Source: Petty and Wegener (1999)

Table I.
Postulates of the elaboration likelihood model

Model assumptions and its descriptive nature

The critique of the ELM begins with its development and whether the experimental studies carried out by Petty, Cacioppo and their associates actually led directly to the conceptual framework of the ELM, or if the task of bringing together disparate ideas from the literature required some intuitive or conceptual leap. On examination of the ELM studies, as its initial development, it becomes increasingly clear that the theoretical stance of Petty and Cacioppo was built largely on a compilation of previous empirical research (Petty and Cacioppo, 1981a; Petty *et al.*, 1983), apparently created to fit the theoretical framework of the model *after* it was proposed. Indeed, Petty *et al.* (1987, p. 233) describe the ELM as:

> […] an attempt to integrate the many seemingly conflicting findings in the persuasion literature under one conceptual umbrella by specifying a finite number of ways in which source, message and other variables have an impact on attitude change.

For example, earlier studies implicitly assumed that message arguments were more difficult and complex to process than peripheral cues (Ajzen, 1999). As such, message

arguments were classified as being more important than source cues, when the motivation and ability to process a message were high. Another assumption, and one which is central to the initial methodology of ELM studies, is that the product category of disposable razors were at that time highly involving, while toothbrushes were of low-involvement, and that classification could be applied to everyone in the media audience. There appears to be no real basis for these assumptions. In fact, the entire involvement variable here seems to be assumed, rather than constructed and measured.

Petty and Cacioppo's involvement manipulation has also received criticism. For example, Choi and Salmon (2003) proposed that Petty and Cacioppo assumed that correct recall of the product that subjects were expecting as a gift meant that people were highly involved with the advertised product. Without a clear and consistent framework, weak and strong arguments developed using the traditional ELM empirical derivation model in one study, may have quite different characteristics to other studies that are perceived to be similar. These characteristics are likely to be the result of the sample population, the research topic or even the context of the research. Therefore, research is required to define argument quality to improve its interpretation, and its application in ELM study design.

As a result of the ELM development as a synthesis of a very diverse and confusing literature base (Petty and Wegener, 1999), and because of the inherent assumptions made in this development, the result is a model that is inherently descriptive (Bitner and Obermiller, 1985; Eagly and Chaiken, 1993; Stiff and Mongeau, 1994; Stephenson *et al.*, 2001; Cook *et al.*, 2004). Indeed, Eagly and Chaiken (1993, p. 321) suggest:

> These inferences are descriptive because the model does not specify on an a priori basis why exposure to many (vs few) arguments ought to motivate or enable objective processing, why prior knowledge ought to motivate or enable biased processing, or why source variables ought to motivate objective processing when the elaboration likelihood is moderate.

The strength of the model lies in its integration of these contextual and individual variables to describe the process of persuasion (Eagly and Chaiken, 1993; O'Keefe, 1990). Yet, in doing so, it fails to model effectively the psychological process or explain the relationships and the conditions of the persuasive process, how these processes may vary and how to predict differential outcomes or occurrences (Choi and Salmon, 2003; Cook *et al.*, 2004).

The hypothesized processes are not clearly articulated and could potentially describe a number of situations (Mongeau and Stiff, 1993; Stephenson *et al.*, 2001; Cook *et al.*, 2004). This is perhaps a result of assigning multiple functions to variables (Parloff, 1993). Petty *et al.* (1987) proposed that variables affect the amount and direction of information processing. While this can be seen as strength of the model (Petty and Wegener, 1999), it makes the ELM very difficult to test and falsify (Mongeau and Stiff 1993). Stiff and Mongeau (1994, p. 71) suggested that, "A model that is not falsified has limited theoretical utility". When these researchers sought to develop a causal model to test the predictions of the ELM, they concluded that a number of different models could be drawn.

The issue of falsification has been raised by many writers (O'Keefe, 1990; Stephenson *et al.*, 2001; Cook *et al.*, 2004), all of whom contend that the falsification of the hypothesis that a persuasive argument will be elaborated on under central route conditions is confounded because attitude change can potentially occur under other means. That is, a

lack of evidence of attitude change does not mean an absence of persuasion, but rather that one particular form of persuasion failed under those particular circumstances (Cook *et al.*, 2004). O'Keefe (1990) also asserts that it is impossible to falsify the hypothesis for argument strength in ELM, when the definition of argument strength says that strong arguments prompt high elaboration (O'Keefe, 1990). O'Keefe (1990, p. 110) concludes, "The strength of the relationship is true by definition, given the definition of argument strength used in ELM research". It is interesting to ponder that if the ELM was presented as a descriptive rather than an analytical model, perhaps it would not be challenged by most of these critics (Cook *et al.*, 2004).

Continuum questions

The most critical construct of the ELM is the elaboration continuum. However, since its initial mention in 1983, the elaboration likelihood continuum has not undergone comprehensive empirical testing. Of importance, here, is the notion, raised by several researchers of the "cognitive miser". This suggests that people have a default setting for low elaboration and that may be the outcome of the ever increasing bombardment of information to which they are exposed (Schumann *et al.*, 2011; Kerr and Schultz, 2010).

Based on the continuum, several studies were conducted to examine how moderate elaboration likelihood, acting as a middle-ground between high and low elaboration likelihood and affected persuasion (Petty and Cacioppo, 1984; Petty and Priester, 1994). However, the majority of research has continued to test levels of elaboration likelihood under three distinct conditions: high, low and moderate. In such experiments, the resultant processes are viewed as relatively separate, with only minimal consideration given to interaction between the three conditions. By its very nature, however, a continuum ought to show a natural progression from high to low involvement, and the effects which occur along the way. Within the context of the ELM, persuasion and the processes which influence attitude formation are described as occurring at different points along the elaboration likelihood continuum (Petty *et al.*, 2005). As it is depicted in the literature, the ELM is still unable to account for, or explain movement along the continuum, and between the central and peripheral routes to persuasion (Choi and Salmon, 2003) and it is now accepted that attitude change generally results from both central and peripheral processes (Petty *et al.* 1997).

Multi-channel processing

The ELM is a dual-process model of attitude change as there are two paths in the process of message reception, attitude change and possible behaviour. If the receivers are motivated and able to process and the message is strong and data-based, persuasion will occur. If not, the receiver will rely on auxiliary features such as peripheral cues or heuristics to avoid the effort of elaboration. The Heuristic Systematic Model (HSM), which relies on heuristics rather than peripheral cues is also an example of dual process models, which are considered the most influential persuasion paradigm (Crano and Prislin, 2006).

The nature of these dual paths and especially their interactivity has been questioned since the ELM was introduced (Bitner and Obermiller, 1985). Stiff (1986) argued that the ELM had been based on many assumptions, including the assumption that message recipients were unable to process message arguments and peripheral cues simultaneously. Noting that single channel processing models had been discredited,

Stiff questioned whether the ELM framework was valid. In response to Stiff, Petty *et al.* (1987) argued that the model does not preclude multi-channel processing of information. The response highlighted that, in certain situations, peripheral cues may dominate central message arguments; however, both routes to persuasion may be utilized during attitude formation (Petty *et al.*, 1987). Stiff further argued that although a continuum of elaboration likelihood, anchored by the peripheral and central routes, was proposed (Petty *et al.*, 1987), the ELM diagram did not originally and still does not reflect this. Moreover, Stiff and Boster (1987) argued that while situations in which central or peripheral routes would be taken had been explained, there was no evidence of scenarios when *both* routes would or could predict attitude change.

Since the criticisms were raised by Stiff *et al.*, other researchers have attempted to understand whether central and peripheral processing occurs simultaneously. The original ELM experiments by Petty and Cacioppo, included situations where message content often contradicted the peripheral cues' validity, thus favouring one route over the other (Chaiken and Maheswaran, 1994). Due to the dichotomy inherent in the research design, examples of multi-channel processing in the ELM were not likely to occur.

In an attempt to demonstrate the notion that a peripheral cue could have an impact on the central route by fostering message acceptance, Mackenzie *et al.* (1986) advocated a Dual Mediation Model (DMM). The DMM eloquently demonstrated that the central and peripheral processing routes were not mutually exclusive (Coulter and Punj, 2004). Following this research stream, the Combined Influence Hypothesis, grounded in ELM literature, was introduced almost a decade later. It demonstrated that message arguments and peripheral cues worked in combination to form attitudes, despite differing levels of motivation and ability to process (Lord *et al.*, 1995).

Other critics of the multi-channel ELM offered a different solution. Instead of looking at the interrelationship of the two paths, they proposed a single cognitive process to account for the effects of source and message in persuasion (Crano and Prislin, 2006). Kruglanski and Thompson's (1999) unimodel of human judgement suggests that people follow normative and heuristic rules to make judgements consistent with the evidence they consider (Kruglanski and Orehek, 2009). The unimodel draws from classical or evaluative conditioning, and also embraces elements of the ELM such as motivation and ability to process the information. In developing the unimodel, Kruglanski and Thompson questioned both the inclusion of a variety of types and conditions in the construct of persuasion, as well as the fundamental conceptualization of a continuum. They suggest:

> […] the critical distinction between cues/and or heuristics on the one hand and message arguments on the other refers to informational contents relevant to a conclusion, rather than to principled difference in the persuasion process as such" (Kruglanski and Thompson, 1999, p. 88).

Mediating variables of the ELM

In addition to multi-channel processing, many studies have examined the variables which mediate elaboration likelihood in the ELM, particularly affect, involvement and cognitive responses. Not only do the following studies show important stages in the history of the ELM but they also illuminate the enormous presence and continued reliance upon the model in advertising research.

Bitner and Obermiller (1985) were among the first researchers to study affect in terms of the ELM, when they questioned whether peripheral processing really influenced affect. At the time, the ELM integrated many variables under the umbrella of "peripheral cues", including cognitive short-cuts and affective responses. As such, it was questioned whether the ELM was underspecified due to its grouping of divergent effects (Bitner and Obermiller, 1985). Petty and Cacioppo's (1986) revision and expansion of the ELM clarified many issues surrounding this variable, stating that in situations where elaboration likelihood is high, one's feelings may be central to the communication setting, and, therefore subject to greater scrutiny (Petty *et al.*, 2003). Thus, in instances of high elaboration likelihood, emotions serve as persuasive arguments (Petty and Cacioppo, 1986). Alternatively, when individuals are relatively unmotivated or unable to process issue-relevant information, affect may serve as a peripheral cue. In these instances of low elaboration likelihood, people tend to use their moods as informative heuristics with relatively little thought given (Petty *et al.*, 2001, 2003). Moreover, an individual's affective state can be responsible for the direction that information processing will take along the elaboration likelihood continuum (Petty *et al.*, 2001, 2003).

Despite clear depictions of affect as a mediating variable in both central and peripheral routes, much literature still views affect as being associated solely with the peripheral route (Miller *et al.*, 2009). Morris *et al.* (2005) argued that the ELM carries an underlying assumption, that is, that attitude change is mostly reached through cognition, not emotion in arguing that the ELM classifies affect as a peripheral cue, while central route processing favours cognition. By suggesting the ELM be refined to include affect as the "emotional core" of cognition, these researchers are said to ignore studies which have sought to delineate specific conditions and situations in which affect may take on the role of a persuasive argument, thereby inducing central route processing (Petty and Cacioppo, 1986; Petty *et al.*, 1988). Furthermore, their assertion that cognition has an "emotional core" has been previously alluded to in the literature (Cacioppo *et al.*, 1986), whereby in instances of moderate elaboration likelihood, affect served to influence cognitive processing of information.

Involvement is a prime determinant of whether attitude change is induced via the central or peripheral route (Petty and Cacioppo, 1981b). Petty and Cacioppo (1986) initially used the term "issue involvement" to describe an individual's personal relevance to a communication setting. It was found that as a message became more personally relevant (i.e. increased issue involvement), individuals were more likely to expend greater cognitive effort in evaluating relevant arguments (Petty and Cacioppo, 1986) and engage in behaviour that was more consistent with their attitudes (Leippe and Elkin, 1987). In addition to issue involvement, Petty and Cacioppo (1986) examined "response involvement". Response involvement deals less with how the issue is personally relevant, and more with how the outcome of adopting a certain position will be immediately beneficial. In contrast to issue involvement, response involvement was found to decrease the amount of cognitive effort an individual expended when processing a message, caused by increased distraction or anxiety of the message receiver, which thereby inhibited a "central route to persuasion" approach (Petty and Cacioppo, 1986).

Johnson and Eagly (1989) stated that Petty and Cacioppo's "issue involvement" construct was a misnomer, and that the term "outcome-relevant involvement" should be used instead. Greenwald and Leavitt (1984) acknowledged the confusion regarding the variable of involvement prior to Johnson and Eagly's concerns, when they stated that there was little agreement on what cognitive processes corresponded to the various levels of involvement. While some researchers have interpreted involvement based on personal connections and values, others have focused more on the complexity of decision-making and arousal (Greenwald and Leavitt, 1984). Due to the confusion surrounding the appropriate terminology used to describe an individual's level of involvement, Petty and Cacioppo (1990) proposed a continuum of personal importance instead of utilizing discrete terms.

Although it is accepted that changes induced via the central route tend to be enduring and predictive of behaviour (Cialdini *et al.*, 1981), Barden and Petty (2008) investigated why the extent of actual thought would impact attitude certainty, a relationship that had been accepted as a postulate of the ELM since its inception. They concluded that individuals who have a higher NFC will process a message to a greater extent, will perceive that they are processing it at length and will, therefore, feel more certain of their attitudes. Based on the findings of Barden and Petty (2008), the same level of attitude certainty can be reached simply by leading individuals to *believe* that they have elaborated extensively. If this low-effort process can produce the same levels of attitude certainty as previously believed to be created solely through the central route, then it is unclear how this finding fits into the model, and whether it challenges the underpinnings of the ELM.

In addition to the amount of thought (the quantitative dimension) is the qualitative (type and nature of thinking) effect (Petty and Wegener, 1999; Petty *et al.*, 1995). The ELM does not distinguish between these effects as the amount of elaboration has been the primary focus of the model and because often the two occur simultaneously. Petty and Wegener (1999) also suggest:

> […] at the empirical level […] it might sometimes be difficult to discern whether any given low-elaboration effect differs from a high elaboration effect because of the quantitative or qualitative mechanism (Petty and Wegener, 1999, p. 49).

Cognitive response and argument strength was further explored by Stephenson *et al.* (2001). Consistent with the ELM, they found support for the idea that cognitive responses do mediate the argument strength–attitude relationship for high-to-moderately high involvement participants. Strong argument messages generated greater positive cognitive responses than those with weak arguments. They also confirmed that perceived argument quality and perceived source credibility were co-related. While this is consistent with Information Processing Theory, it is not predicted in ELM. It is also interesting to note that in this experiment, they could not produce a true low involvement condition.

By considering the literature pertaining to the ELM, one can see that few studies have sought to replicate the initial methodological framework from which the model was derived. With traditional advertising theories' applicability to the current media environment being questioned, including consumer resistance to advertising (Areni, 2003; Cho, 1999; Malaviya, 2007; Miller *et al.*, 2009), it is evident that replicating the

original ELM study could provide one method of determining the applicability of the model in today's marketplace.

Replication of the ELM

Most replications of the ELM occurred shortly after its development, and were carried out by researchers associated with Petty and Cacioppo. Most studies have focused on trying to replicate a portion, variable, or construct of the ELM (Kang and Herr, 2006; See *et al.*, 2009; Te'eni-Harari *et al.*, 2007; Trampe *et al.*, 2010). However, since the late 1980s, the forms and distribution of advertising have changed dramatically, due to the creation of the internet (Calder and Malthouse, 2005; Truong *et al.*, 2010), leading researchers to question the applicability of many existing advertising theories (Cho, 1999; Wicherts *et al.*, 2006; Wicherts and Bakker, 2012).

Of the studies which have sought to replicate the original ELM study, it is insightful that all, without exception, questioned the model's validity. For example, when the ELM was closely replicated in one such study, the results gave little to no support for the model's postulates (Cole *et al.*, 1990). Although slightly different products were used in the empirical test's advertisements, the ELM should be robust enough to withstand minor product alterations (Cole *et al.*, 1990).

Recently, the original ELM study was replicated to test its relevance to a young audience (Te'eni-Harari *et al.*, 2007). Interestingly, at both high and low levels of involvement, young people's attitudes were not significantly different and, thus, neither the central nor peripheral route to persuasion was taken (Te'eni-Harari *et al.*, 2007). It has been argued that these findings may be attributed to Petty and Cacioppo's sole use of college students as subjects (Te'eni-Harari *et al.*, 2007). College students are said to possess higher NFC and greater cognitive abilities, making the results not generalizable to other populations, including youths (Te'eni-Harari *et al.*, 2007; James and Sonner, 2001).

Another possibility as to why the ELM has remained difficult to replicate is that argument quality manipulations have varied across studies (Mongeau and Williams, 1996). Interestingly, Johnson and Eagly (1989) noted that only researchers associated with Petty and Cacioppo were able to generate results consistent with the ELM's predictions. Mongeau and Williams (1996) proposed that researchers not associated with Petty and Cacioppo failed to manipulate argument quality in a way that matches the ELM's original study, thereby leading to different results. A possible reason why argument quality manipulations have been unsuccessful was offered by Areni and Lutz (1988). They found that the arguments used in the original ELM studies differed in terms of the logical aspects of persuasive messages and the desirability of the arguments. For example, strong message arguments advertised the Edge razor, the product used in original ELM experiments, as giving consumers the "smoothest shave possible". Weak message arguments stated that the razor could be used only once (Areni and Lutz, 1988). The strong message arguments differed from the weak message arguments in terms of the way they depicted the razor, as either a desirable or undesirable object. Based on their findings, Areni and Lutz (1988) determined that argument strength and argument valence are important constructs underlying argument quality, and future research on the ELM should attempt to control for both components. However, without recognizing a consistent measure of argument quality, future ELM studies may well continue to show conflicting results.

As expected, Petty and Cacioppo have shown relatively enduring support for their model and have responded to the various critiques. Thus, they have updated the model based upon the divergent findings, and have considered the different variables thought to influence attitude formation. It should be noted, however, that as the ELM evolved in the literature over time, its empirical testing has lagged well behind its use as a major factor in the literature (Karson and Korgaonkar, 2001).

Managerial implications and future recommendations

This paper offers a number of implications for managers. To begin with, it is essential to recognize the omnipresence of the ELM in practice. This institutionalized and enduring model often provides the framework for marketing planning processes, although as noted by Szczepanski (2006), many advertising practitioners have questioned the predictive abilities of the model. Given the concerns raised in this paper about the model's assumptions and its descriptive nature, practitioners should be cautious before using the model as the sole basis for communication planning. It has also been said that academic researchers often complain that their research seems to have little relevance for practitioners. Thus, for academics to continue to base their research on such a heavily criticized model, one which does not appear to be attuned to today's world of digital communications, may simply serve to widen the chasm between academics and practitioners.

Managers should be encouraged to investigate new methodologies and technologies such as metacognition and neuroscience to help better understand consumer thinking and processing or even to test the assumptions in their planning processes, and not be tied to what may be outdated thinking.

Based on an understanding of the ELM model, an exploration of its scope and limitations, a review of its replication record and the process of replication, we now turn to the future. The first question to address is whether the ELM should or could be replicated. Pioneering research results that are heavily cited later by other researchers should be examined for their reproducibility (Monroe, 1991, 1992; Wicherts *et al.*, 2006; Wicherts and Bakker, 2012). Evidence has already been presented to show that only researchers associated with Petty and Cacioppo were able to generate results consistent with the ELM's predictions (Johnson and Eagly, 1989). The interaction between researchers and empirical study can influence biases such as experimenter expectations (Evanschitzky *et al.*, 2007) which can transfer to the replication if the same researcher, or even other researchers associated with the original researchers conduct the replication. This paper has highlighted some areas in need of future research, such as a conceptual definition of argument quality or an explanation of movement along the continuum and between central and peripheral routes to persuasion. A replication with an extension may investigate the generalizability of the outcomes beyond its original context, by changing the population from students or investigating the passage of time.

While the need for replication is urgent, reluctance is also inevitable. Researchers are often averse to replicate original studies even where subsequent studies are unable to reproduce the original findings (Madden *et al.*, 1992, Monroe, 1992). Researchers are also mindful that the chance of actually having a replication study published is very rare (Easley *et al.*, 2000; Evanschitzky *et al.*, 2007), with strong editorial and reviewer bias against such research.

Summary and conclusions

The preceding theoretical critique has attempted to explain issues pertaining to the ELM since its development 30 years ago. Four major research areas surrounding the model were detailed: the development and descriptive nature of the model, the continuum questions, multi-channel processing and a sampling of the mediating variables affecting elaboration likelihood. In addition to some of its more formal critiques, the replication record was examined and the process and possibility of replication itself.

The ELM model was developed during the mass-media marketing communication days of the 1980s. Thus, it is possible the media environment and the way consumers' process advertising exposures may well have changed, possibly dramatically (Kitchen, 2010, 2013). Issues such as simultaneous media usage and insights from neuroscience raise additional concerns. Theories underpinning the marketing discipline have largely been left unexamined and, when tested, have a poor record of replication (Evanschitzky *et al.*, 2007).

Recent studies have emphasized an online component whose inputs seem to affect persuasion (Hershberger, 2003; Karson and Korgaonkar, 2001; Liu and Shrum, 2009; SanJosé-Cabezudo *et al.*, 2009; Sinclaire *et al.*, 2010; Tam and Ho, 2005; Yang *et al.*, 2006). For instance, Hershberger (2003) expanded on the ELM, developing an electronic ELM (eELM) to understand the process of turning advertising content into enhanced brand and advertisement attitudes. However, when aspects of the ELM's traditional study were replicated, Hershberger (2003) found that message involvement did not play a moderating role in the formation of attitudes in an online context. Thus, while facets of the ELM were widely supported in other aspects of this study (Hershberger, 2003), its applicability to current advertising environments was questioned (Karson and Korgaonkar, 2001). Even studies which replicate the ELM using different age groups have found that the model does not apply there either (Te'eni-Harari *et al.*, 2007).

Without showing the dynamic nature of the persuasion process, which is referred to in most ELM literature conducted after 1984, the very framework upon which the ELM is founded remains questionable. Thus, the need for replication of the model in its old or any new form is needed. Along with testing the model in its current form, future opportunities exist for researchers to determine when message processing shifts from predominantly central route processing to predominantly peripheral route processing (Petty *et al.*, 2003). Understanding when these shifts occur will allow for a better understanding of the elaboration likelihood continuum itself, and the ELM as a whole.

This paper argues that the strong literature base, which both supports and institutionalizes the ELM, is the result of the model's inherent descriptive and accommodating nature and strong academic precedent and investment, rather than an artefact of its generalizability based on a strong replication record. The number of citations of any work is insufficient support for the wholehearted acceptance of any particular concept, approach or experiment, and we recommend that some of the discipline's most cited works might prove a good base to begin (Kerr and Schultz, 2010). As a result, we encourage researchers to consider further elaboration of the ELM.

References

Ajzen, I. (1999), "Dual-mode processing in the pursuit of insight is no vice", *Psychological Inquiry*, Vol. 10 No. 2, pp. 110-181.

Ajzen, I. and Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, Englewood Cliffs, NJ.

Areni, C.S. (2003), "The effects of structural and grammatical variables on persuasion: an elaboration likelihood model perspective", *Psychology and Marketing*, Vol. 20 No. 4, pp. 349-375.

Areni, C.S. and Lutz, R.J. (1988), "The role of argument quality in the elaboration likelihood model", *Advances in Consumer Research*, Vol. 15, pp. 197-203.

Barden, J. and Petty, R.E. (2008), "The mere perception of elaboration creates attitude certainty: exploring the thoughtfulness heuristic", *Journal of Personality and Social Psychology*, Vol. 95 No. 3, pp. 489-509.

Bitner, M.J. and Obermiller, C. (1985), "The elaboration likelihood model: limitations and extensions in marketing", *Advances in Consumer Research*, Vol. 12 No. 1, pp. 420-425.

Cacioppo, J.T., Petty, R.E., Kao, C.F. and Rodriguez, R. (1986), "Central and peripheral routes to persuasion: an individual difference perspective", *Journal of Personality and Social Psychology*, Vol. 51 No. 5, pp. 1032-1043.

Calder, B.J. and Malthouse, E.C. (2005), "Managing media and advertising change with integrated marketing", *Journal of Advertising Research*, Vol. 43 No. 4, pp. 356-361.

Chaiken, S. and Maheswaran, D. (1994), "Heuristic processing can bias systematic processing: effects of source credibility, argument ambiguity, and task importance on attitude judgment", *Journal of Personality and Social Psychology*, Vol. 66 No. 3, pp. 460-473.

Cho, C.H. (1999), "How advertising works on the WWW: modified elaboration likelihood model", *Journal of Current Issues and Research in Advertising*, Vol. 21 No. 1, pp. 33-50.

Choi, S.M. and Salmon, C.T. (2003), "The elaboration likelihood model of persuasion after two decades: a review of criticisms and contributions", *The Kentucky Journal of Communication*, Vol. 22 No. 1, pp. 47-77.

Cialdini, R.B., Petty, R.E. and Cacioppo, J.T. (1981), "Attitude and attitude change", in Rosenzweig, M.R. and Porter, L.W. (Eds), *Annual Review of Psychology*, Vol. 32, Annual Review Press, Palo Alto, CA, pp. 357-404.

Cole, C., Ettenson, R., Reinke, S. and Schrader, T. (1990), "The elaboration likelihood model (ELM): replications, extensions, and some conflicting findings", *Advances in Consumer Research*, Vol. 17, pp. 231-236.

Cook, A., Moore, K. and Steel, G. (2004), "The taking of a position: a reinterpretation of the elaboration likelihood model", *Journal for the Theory of Social Behaviour*, Vol. 34 No. 4, pp. 315-331.

Coulter, K.S. and Punj, G.N. (2004), "The effects of cognitive resource requirements, availability, and argument quality on brand attitudes: a melding of elaboration likelihood and cognitive resource matching theories", *Journal of Advertising*, Vol. 33 No. 4, pp. 53-64.

Crano, W. and Prislin, R. (2006), "Attitudes and persuasion", *Annual Review of Pyschology*, Vol. 57, pp. 345-374.

Eagly, A.H. and Chaiken, S. (1993), *The Psychology of Attitudes*, Brace Jovanovich College Publishers, Fort Worth, TX.

Easley, R.W., Madden, C.S. and Dunn, M.G. (2000), "Conducting marketing science: the role of replication in the research process", *Journal of Business Research*, Vol. 48, pp. 83-92.

Evanschitzky, H., Baumgarth, C., Hubbard, R. and Armstrong, J.C. (2007), "Replication research's disturbing trend", *Journal of Business Research*, Vol. 60, pp. 411-415.

Fishbein, M. and Ajzen, I. (1972), "Attitudes and opinions", *Annual Review of Psychology*, Vol. 23, pp. 487-544.

Fishbein, M. and Ajzen, I. (2010), *Predicting and changing Behavior: The Reasoned Action Approach*, Psychology Press (Taylor and Francis), New York, NY.

Greenwald, A.G. and Leavitt, C. (1984), "Audience involvement in advertising: four levels", *Journal of Consumer Research*, Vol. 11, pp. 581-592.

Haugtvedt, C.P. and Petty, R.E. (1989), "Need for cognition and attitude persistence", *Advances in Consumer Research*, Vol. 16, pp. 33-36.

Hershberger, E.K. (2003), "eELM: a replication and enhancement of the elaboration likelihood model for computer mediated environments", Doctoral dissertation.

James, W.L. and Sonner, B.S. (2001), "Just say no to traditional student samples", *Journal of Advertising Research*, Vol. 41 No. 5, pp. 63-71.

Johnson, B.T. and Eagly, A.H. (1989), "Effects of involvement on persuasion: a meta-analysis", *Psychological Bulletin*, Vol. 106 No. 2, pp. 290-314.

Kang, Y.S. and Herr, P.M. (2006), "Beauty and the beholder: toward an integrative model of communication source effects", *Journal of Consumer Research*, Vol. 33, pp. 123-130.

Karson, E.J. and Korgaonkar, P.K. (2001), "An experimental investigation of internet advertising and the elaboration likelihood model", *Journal of Current Issues and Research in Advertising*, Vol. 23 No. 2, pp. 53-72.

Kerr, G. and Schultz, D. (2010), "Maintenance man or architect? The role of academic advertising research in building better understanding", *International Journal of Advertising*, Vol. 29 No. 4, pp. 547-568.

Kitchen, P.J. (Ed) (2010), *Integrated Brand Marketing and Measuring Returns*, Palgrave-Macmillan, Basingstoke.

Kitchen, P.J. (Ed) (2013), *The Dominant Influence of Marketing in the 21st Century: The Marketing Leviathan*, Palgrave-Macmillan, Basingstoke.

Kruglanski, A. and Orehek, E. (2009), "Toward a relativity theory of rationality", *Social Cognition*, Vol. 27 No. 5, pp. 639-660.

Kruglanski, A.W. and Thompson, E.P. (1999), "Persuasion by a single route: a view from the unimodel", *Psychological Inquiry*, Vol. 10 No. 2, pp. 83-109.

Leippe, M.R. and Elkin, R.A. (1987), "When motives clash: issue involvement and response involvement as determinants of persuasion", *Journal of Personality and Social Psychology*, Vol. 52 No. 2, pp. 269-278.

Liu, Y. and Shrum, L.J. (2009), "A dual-process model of interactivity effects", *Journal of Advertising*, Vol. 38 No. 2, pp. 53-68.

Lord, K.R., Lee, M.S. and Sauer, P.L. (1995), "The combined influence hypothesis: central and peripheral antecedents of attitude toward the ad", *Journal of Advertising*, Vol. 24 No. 1, pp. 73-85.

MacKenzie, S.B., Lutz, R.J. and Belch, G.E. (1986), "The role of attitude toward the ad as a mediator of advertising effectiveness: a test of competing explanations", *Journal of Marketing Research*, Vol. 23, pp. 130-143.

Malaviya, P. (2007), "The moderating influence of advertising context on ad repetition effects: the role of amount and type of elaboration", *Journal of Consumer Research*, Vol. 34 No. 1, pp. 32-40.

Miller, C.E., Reardon, J., Salciuviene, L., Auruskeviciene, V., Lee, K. and Miller, K.E. (2009), "Need for cognition as a moderator of affective and cognitive elements in online attitude toward the brand formation", *Journal of Business and Economics Research*, Vol. 7 No. 12, pp. 65-72.

Mongeau, P.A. and Stiff, J.B. (1993), "Specifying causal relationships in the ELM", *Communication Theory*, Vol. 3, pp. 61-72

Mongeau, P.A. and Williams, M.L.M. (1996), "Argument quality and the elaboration likelihood model of persuasion", paper presented at the Annual Meeting of the International Communication Association, Chicago, IL.

Monroe, K.B. (1991), "On replications in consumer research: part 1", *Journal of Consumer Research*, Vol. 19, June.

Monroe, K.B. (1992), "On replications in consumer research: part 2", *Journal of Consumer Research*, Vol. 19, September.

Morris, J.D., Woo, C.M. and Singh, A.J. (2005), "Elaboration likelihood model: a missing intrinsic emotional implication", *Journal of Targeting, Measurement and Analysis for Marketing*, Vol. 14 No. 1, pp. 79-98.

O'Keefe, D.J. (1990), *Persuasion: Theory and Research*, Sage Publications, Newbury Park, CA.

Parloff, R. (1993), *The Dynamics of Persuasion*, Lawrence Erlbaum Associates, Hillsdale, NJ.

Pasadeos, Y., Phelps, J. and Edison, A. (2008), "Searching for our 'own theory' in advertising: an update of research networks", *Journalism and Mass Communication Quarterly*, Vol. 85 No. 4, pp. 785-806.

Petty, R.E. (2006), "A metacognitive model of attitudes", *Journal of Consumer Research*, Vol. 33, June, pp. 22-25.

Petty, R.E. and Cacioppo, J.T. (1979), "Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses", *Journal of Personality and Social Psychology*, Vol. 37 No. 10, pp. 1915-1926.

Petty, R.E. and Cacioppo, J.T. (1981a), *Attitudes and Persuasion: Classic and Contemporary Approaches*, Wm. C. Brown Company Publishers, Dubuque, IA.

Petty, R.E. and Cacioppo, J.T. (1981b), "Issue involvement as a moderator of the effects on attitude of advertising content and context", *Advances in Consumer Research*, Vol. 8, pp. 20-24.

Petty, R.E. and Cacioppo, J.T. (1983), "Central and peripheral routes to persuasion: application to advertising", in Percy, L. and Woodside, A.G. (Eds), *Advertising and Consumer Psychology*, D.C. Heath and Company, Lexington, MA, pp. 3-23.

Petty, R.E. and Cacioppo, J.T. (1984), "Source factors and the elaboration likelihood model of persuasion", *Advances in Consumer Research*, Vol. 11, pp. 668-672.

Petty, R.E. and Cacioppo, J.T. (1986), *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*, Springer-Verlag, New York, NY.

Petty, R.E. and Cacioppo, J.T. (1990), "Involvement and persuasion: tradition versus integration", *Psychological Bulletin*, Vol. 107 No. 3, pp. 367-374.

Petty, R.E. and Priester, J.R. (1994), "Mass media attitude change: implications of the elaboration likelihood model of persuasion", in Bryant, J. and Zillmann, D. (Eds), *Media Effects: Advances in Theory and Research*, Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 99-122.

Petty, R.E. and Wegener, D.T. (1999), "The elaboration likelihood model: current status and controversies", in Chaiken, S. and Trope, Y. (Eds), *Dual Process Theories in Social Psychology*, Guilford Press, New York, NY, pp. 44-72.

Petty, R.E., Cacioppo, J.T. and Schumann, D. (1983), "Central and peripheral routes to advertising effectiveness: the moderating role of involvement", *Journal of Consumer Research*, Vol. 10, pp. 135-146.

Petty, R.E., Cacioppo, J.T., Sedikides, C. and Strathman, A.J. (1988), "Affect and persuasion: a contemporary perspective", *The American Behavioral Scientist*, Vol. 31 No. 3, pp. 355-371.

Petty, R.E., Cacioppo, J.T., Strathman, A.J. and Priester, J.R. (2005), "To think or not to think: exploring two routes to persuasion", in Brock, T.C. and Green, M.C. (Eds), *Persuasion: Psychological Insights and Perspectives*, 2nd ed., Sage Publications, Thousand Oaks, CA, pp. 81-116.

Petty, R.E., DeSteno, D. and Rucker, D.D. (2001), "The role of affect in attitude change", in Forgas, J.P. (Ed), *Handbook of Affect and Social Cognition*, Lawrence Erlbaum Associates, Mahwah, NJ, pp. 212-233.

Petty, R.E., Fabrigar, L.R. and Wegener, D.T. (2003), "Emotional factors in attitudes and persuasion", in Davidson, R.J., Sherer, K.R. and Goldsmith, H.H. (Eds), *Handbook of Affective Sciences*, Oxford University Press, Oxford, pp. 752-772.

Petty, R.E., Haugtvedt, C.P. and Smith, S.M. (1995), "Message elaboration as a determinant of attitude strength", in Petty, R.E. and Krosnick, J.A. (Eds), *Attitude Strength: Antecedents and Consequences*, Erlbaum, Hillsdale, NJ.

Petty, R.E., Kasmer, J.A., Haugtvedt, C.P. and Cacioppo, J.T. (1987), "Source and message factors in persuasion: a reply to stiff's critique of the elaboration likelihood model", *Communication Monographs*, Vol. 54, pp. 233-249.

Petty, R.E., Wegener, D.T. and Fabrigar, L.R. (1997), "Attitudes and attitude change", *Annual Review of Psychology*, Vol. 48, pp. 609-647.

SanJosé-Cabezudo, R., Gutiérrez-Arranz, A.M. and Gutiérrez-Cillán, J. (2009), "The combined influence of central and peripheral routes in the online persuasion process", *CyberPsychology and Behavior*, Vol. 12 No. 3, pp. 299-308.

Schumann, D.W., Kotowski, M., Ahn, H. and Haugtvedt, C. (2011), in Moriarty, S. (Ed), *The Elaboration Likelihood Model: A Thirty Year Review*.

Schumann, D.W., Kotowski, M.R., Ahn, H.-Y. and Haugtvedt, C. (2012), "The elaboration likelihood model: a 30-year review", in Rodgers, S. and Thorson, E. (Eds), *Advertising Theory*, Routledge, NY, pp. 51-68

See, Y.H.M., Petty, R.E. and Evans, L.M. (2009), "The impact of perceived message complexity and need for cognition on information processing and attitudes", *Journal of Research in Personality*, Vol. 43, pp. 880-889.

Sinclaire, J.K., Simon, J.C. and Wilkes, R.B. (2010), "A prediction model for initial trust formation in electronic commerce", *International Business Research*, Vol. 3 No. 4, pp. 17-27.

Stephenson, M., Benoit, W. and Tschida, D. (2001), "Testing the mediating role of cognitive responses in the ELM", *Communication Studies*, Vol. 52 No. 4, pp. 324-337.

Stiff, J.B. (1986), "Cognitive processing of persuasive message cues: a meta-analytic review of the effects of supporting information on attitudes", *Communication Monographs*, Vol. 53, pp. 75-89.

Stiff, J.B. and Boster, F.J. (1987), "Cognitive processing: additional thoughts and a reply to Petty, Kasmer, Haugtvedt, and Cacioppo", *Communication Monographs*, Vol. 54, pp. 250-256.

Stiff, J.B. and Mongeau, P.A. (1994), *Persuasive Communication*, Guildford Press, New York, NY.

Szczepanski, C.M. (2006), "General and special interest magazine advertising and the elaboration likelihood model: a comparative content analysis and investigation of the effects of differential route processing execution strategies", Doctoral dissertation.

Tam, K.Y. and Ho, S.Y. (2005), "Web personalization as a persuasion strategy: an elaboration likelihood model perspective", *Information Systems Research*, Vol. 16 No. 3, pp. 271-291.

Te'eni-Harari, T., Lampert, S.I. and Lehman-Wilzig, S. (2007), "Information processing of advertising among young people: the elaboration likelihood model as applied to youth", *Journal of Advertising Research*, Vol. 47 No. 3, pp. 326-340.

Trampe, D., Stapel, D.A., Siero, F.W. and Mulder, H. (2010), "Beauty as a tool: the effect of model attractiveness, product relevance, and elaboration likelihood on advertising effectiveness", *Psychology and Marketing*, Vol. 27 No. 12, pp. 1101-1121.

Truong, Y., McColl, R. and Kitchen, P. (2010), "Practitioners' perceptions of advertising strategies for digital media", *International Journal of Advertising*, Vol. 29 No. 5, pp. 709-725.

Wicherts, J.M. and Bakker, M. (2012), "Publish (your data) or (let the data) perish! Why not publish your data too?", *Intelligence*, Vol. 40 No. 2, p. 73.

Wicherts, J.M., Borsboom, D., Kats, J. and Molenaar, D. (2006), "The poor availability of psychological research data for reanalysis", *American Psychologist*, Vol. 61 No. 7, pp. 726-728.

Yang, S.C., Hung, W.C., Sung, K. and Farn, C.K. (2006), "Investigating initial trust toward e-tailers from the elaboration likelihood model perspective", *Psychology and Marketing*, Vol. 23 No. 5, pp. 429-445.

Further reading

Coulter, K. (2005), "An examination of qualitative vs quantitative elaboration likelihood effects", *Psychology and Marketing*, Vol. 22 No. 1, pp. 31-49.

Eckert, J.A. and Goldsby, T.J. (1997), "Using the elaboration likelihood model to guide customer service-based segmentation", *International Journal of Physical Distribution and Logistics Management*, Vol. 27 Nos 9/10, pp. 600-615.

Enis, B.M., Cox, K.K. and Stafford, J.E. (1972), "Students as subjects in consumer behavior experiments", *Journal of Marketing Research*, Vol. 9, pp. 72-74.

Gotlieb, J.B. and Swan, J.E. (1990), "An application of the elaboration likelihood model", *Journal of the Academy of Marketing Science*, Vol. 18 No. 3, pp. 221-228.

Madden, C.S., Easley, R.W. and Dunn, M.G. (1983), "How journal editors view replication research", *Journal of Advertising*, Vol. 23, Winter, pp. 78-87.

Madden, T.J., Ellen, P.S. and Ajzen, I. (1992), "A comparison of the theory of planned behavior and the theory of reasoned action", *Personality and Social Psychology Bulletin*, Vol. 18, pp. 3-9.

Morris, C.D., Bransford, J.D. and Franks, J.J. (1977), "Levels of processing vs transfer appropriate processing", *Journal of Verbal Learning and Verbal Behaviour*, Vol. 16 No. 3, pp. 519-533.

Schultz, D.E. and Kerr, G. (2008), "Filling in the gaps or plugging the holes? Why the academic advertising research model needs maintenance", presented at the European Advertising Academy Annual Meeting, Antwerp Belgium.

Schumann, D.W., Petty, R.E. and Clemons, D.S. (1990), "Predicting the effectiveness of different strategies of advertising variation: a test of the repetition-variation hypotheses", *Journal of Consumer Research*, Vol. 17, pp. 192-202.

Shuptrine, F.K. (1975), "On the validity of using students as subjects in consumer behavior investigations", *The Journal of Business*, Vol. 48, pp. 383-390.

Swasy, J.L. and Munch, J.M. (1985), "Examining the target of receiver elaborations: rhetorical question effects on source processing and persuasion", *Journal of Consumer Research*, Vol. 11, pp. 877-886.

Corresponding author

Philip J. Kitchen can be contacted at: philip.kitchen@esc-rennes.fr