RUNNING HEAD: LEARNING TO LIKE

Conditioning as a source of liking: There is nothing simple about it

Jan De Houwer

Ghent University, Ghent, Belgium

mailing address: Jan De Houwer
Ghent University
Henri Dunantlaan 2
B-9000 Ghent
Belgium
email: Jan.DeHouwer@UGent.be

phone: 0032 9 264 64 45
fax: 0032 9 264 64 89

A core assumption in marketing research is that consumers tend to buy brands and products that they like. Marketeers are therefore eagerly looking for ways to change the liking of brands and products. Classical conditioning is generally considered to be one of the approaches to influence liking. In learning psychology, the term "evaluative conditioning" is used to refer to classical conditioning of liking. It can be defined as a change in the liking of a stimulus that results from pairing this stimulus with another stimulus. The first stimulus is often called the *conditioned stimulus* or CS whereas the second stimulus is often called the *unconditioned stimulus* or US. Typically, a CS will become more positive when it has been paired with a positive US than when it has been paired with a negative US. A well known example of evaluative conditioning in advertising, are the "have-a-Coke-and-a-smile" ads of the Coca-Cola company. In these ads, the Coke brand name (CS) is repeatedly presented together with images of smiling people having fun (US). It is assumed that this will increase the liking of the brand. Other examples involve the presence of liked celebrities or cute animals in a wide range of ads for products that, as such, have little relation to the celebrities or animals that are featured in the ad. The aim is always the same: By pairing the product with pleasent, liked events, it is hoped that a bit of the liking "rubs of" on the product and that because of this, consumers will afterwards be more likely to buy the product. Given the pervasive impact that liking can have on buying behavior, it is indeed crucial for marketeers to understand when and how liking can be "rubbed of" on products, that is, to understand evaluative conditioning.

Laboratory studies have produced many empirical findings about the conditions under which evaluative conditioning can be found. In the present chapter, I will present a brief overview of this research, focusing on those findings that are relevant for marketing (see De Houwer, Thomas, & Baeyens, 2001, for a more extensive review, and De Houwer, Baeyens,

and Field, 2005a, for an update). The existing evidence, however, cannot be interpreted in a meaningful manner without a clear understanding of what the term "evaluative conditioning" means. There is indeed a lot of confusion about what evaluative conditioning is, not only amongst marketeers, but also amongst learning and social psychologists. In the present chapter, I will argue that it can be regarded as a procedure, an effect, or as a process (see De Houwer, 2007, for an in depth discussion). To avoid confusion, it is thus important to always specify the sense in which the term "evaluative conditioning" is used. The analysis also has theoretical implications. When defined as an effect, it becomes clear that evaluative conditioning is not necessarily due to the automatic formation of associations but can also be based on other processes such as controlled propositional reasoning (also see De Houwer et al., 2005a). This insight sheds new light on many contradictory findings that have been reported in the literature. It also leads to the conclusion that researchers should focus not only on *whether* a certain condition is crucial for obtaining evaluative conditioning but also on *when* a certain condition is crucial. This next step in research on evaluative conditioning will provide the basis for a much more sophisticated understanding and use of evaluative conditioning in marketing.

A brief overview of the literature

A first set of studies showed that evaluative conditioning is a general and ubiquitous phenomenon. It has been demonstrated with a large variety of stimuli, including political slogans presented during a free lunch or in a room with aversive odors (e.g., Razran, 1954), neutral pictures of human faces paired with liked or disliked pictures of human faces (e.g., Levey & Martin, 1975), names of (fictitious) products presented in the context of pleasent or unpleasent pictures or music (e.g., Blair & Shimp, 1992; Gorn, 1982; Stuart, Shimp, & Engle, 1987; Pleyers, Corneille, Luminet, & Yzerbyt, 2007; Walther & Grigoriadis, 2004), and

artificial flavorings paired with a bad aftertaste (e.g., Baeyens, Eelen, Van den Bergh, & Crombez, 1990a). To take just one example from the context of marketing, Till and Priluck (2000) exposed members of a test group to 15 trials on which the name of a fictitious brand of mouthwash (CS; e.g., Garra) was presented together with a picture of a pleasant visual scene (US; e.g., a boat in tropical waters). These trials were intermixed with filler trials on which other brand names and pictures were presented. A control group was shown the same pictures but in a semi-random order in which CS-US sequences were not permitted. When participants were afterwards asked to indicate their attitudes toward a number of fictitious brands, participants in the test group were found to like the CS brand (i.e., Garra) more than participants in the control group. Interestingly, this effect was not restricted to the original brand but also extended to other fictitious brands with similar names (e.g., Gurra).

Although there have been many successful demonstrations of evaluative conditioning, it is important to note that genuine failures to observe it have also been reported (e.g., Field & Davey, 1999; Rozin, Wrzensiewski, & Byrnes, 1998), including failures in studies involving brands and products as CSs (e.g., Kellaris & Cox, 1989). This suggests that certain (as yet unknown) boundary conditions need to be fulfilled (see De Houwer et al., 2005a, for a discussion).

On the one hand, the available evidence provides good news for marketeers: There is sound evidence that the liking of brands and products can be changed by pairing them with positive or negative stimuli. On the other hand, paring stimuli does not always seem to work. We therefore need to examine the variables that modulate evaluative conditioning. Two types of variables can be distinguished (De Houwer, 2007): First, variables related to the manner in which the stimuli are paired. Second, variables related to the conditions under which the stimuli are paired.

With regard to the manner in which stimuli are paired, a first important variable is the order of the CS (e.g., the brand name) and US (e.g., pleasent pictures). Evidence suggests that conditioned changes in the liking of the CS are typically larger when it is consistently followed by the US (forward conditioning) than when it is preceded by the US (backward conditioning; e.g., Stuart et al., 1987). When translated to an advertising context, this observation implies that pairing a brand name (CS) with positive images or messages (US) will result in a larger increase in liking of the brand when the positive images or messages are always presented after the brand name.

A second important variable is the number of times that the stimuli are paired. Overall, studies have shown that evaluative conditioning becomes stronger when the number of CS-US pairings increases (e.g., Baeyens, Eelen, Crombez, & Van den Bergh, 1992a). Those same studies suggest, however, that after a certain number of pairings, additional pairings no longer lead to a strengthening of the effect or might even produce a weakening of the effect. Although more research on this topic is needed, overexposing consumers to ads that are based on the principle of evaluative conditioning might thus have adverse effects.

A third factor concerns (changes in) the statistical contingency between the CS and US. This factor underlies research on a range of phenomena such as the effect of statistical contingency, extinction, CS-preexposure, US pre- and postexposure, cue competition, occasion setting, US-revaluation, and counterconditioning. Although it would take us too far to discuss the research on each of these phenomena (see De Houwer et al., 2001, for a review), I would like to note a few findings that are particularly relevant for marketing research. Most important, although the evidenced is mixed, some studies suggest that evaluative conditioning can be resistant to extinction. That is, once the valence of a CS has been changed by pairing it with a US, the learned valence of the CS cannot be erased by

simply presenting the CS on its own (i.e., by removing the CS-US contingency; e.g., Baeyens, Crombez, Van den Bergh, & Eelen, 1988; De Houwer, Baeyens, Vansteenwegen, & Eelen, 2000). This implies that conditioned changes in the liking of brand and products can be long lasting. For instance, when a product is paired with positive images in an ad campaign and if these pairings lead to an increase in the liking of the products, the increased liking of the product can be expected to remain present even after the ad campaign is stopped. This does not imply that conditioned changes in liking can never be erased. One way to change conditioned liking is by counterconditioning, that is, by pairing the CS with a US that has a valence opposite to that of the original US (Baeyens, Eelen, Van den Bergh, & Crombez, 1989). For instance, after brand liking has increased as the result of pairing it with smiling faces, liking can decrease again as the result of pairing the brand with negative stimuli such as frowning faces. Marketeers should also be aware of the phenomenon of US revaluation. This entails that a conditioned change in liking can be reversed by altering the valence of the original US (Baeyens, Eelen, Van den Bergh, & Crombez, 1992b; Walther, 2002). For instance, when a liked celebrity endorses a product in an ad, this could increase the popularity of a brand. But when afterwards, the celebrity gets involved in a scandal and becomes disliked, this would also adversely affect the liking of the brand that the celebrity endorsed, even after the ad campaign has been stopped (see Walther, 2002; Walther, Nagengast, & Trasselli, 2005). A similar risk is present when extending a brand to new products. Brand extension can be seen as an instance of evaluative conditioning: The new product (CS) is liked because it is repeatedly paired with a liked brand name (US; see Till & Priluck, 2000; Walther et al., 2005). In this case, the phenomenon of US-revaluation would imply that when the original brand becomes disliked for some reasons, all products that were related with this brand will also become less liked, even if the connection between the brand and the product

no longer exists.

Until now we have discussed only variables related to the manner in which stimuli are paired. As mentioned above, there is also a second class of variables that is related to the conditions under which the pairings are presented. The variable that has received most attention in this context is awareness of the CS-US contingencies. Some studies suggest that pairing a CS with a US can change the liking of a CS even when participants are not aware of the fact that the CS and US went together. For instance, some variables seem to have a different effect on contingency awareness than on evaluative conditioning (e.g., Baeyens, Eelen, & Van den Bergh, 1990b; Fulcher & Hammerl, 2001). Also, evaluative conditioning has been observed when the CSs or USs were presented so briefly that they could not be detected consciously (e.g., De Houwer, Hendrickx, & Baeyens, 1997; Dijksterhuis, 2004). It should be noted, however, that the evidence regarding unaware evaluative conditioning is mixed. Several well conducted studies strongly suggest that evaluative conditioning occurs only when participants are aware of the CS-US contingencies (e.g., see Field, 2000, and Lovibond & Shanks, 2002, for reviews; see Allen & Janiszewski, 1989, and Pleyers et al., 2007, for evidence in the context of marketing). This debate has important implications for marketeers because its outcome will determine whether marketeers need to draw attention to the fact that the product and US are paired together in order to change the liking of the product.

Misconceptions of (evaluative) conditioning

Although evaluative conditioning is a potentially important tool for influencing consumer behavior, many marketeers and consumer psychologists seem to have an outdated view on (evaluative) conditioning. For instance, in textbooks of consumer behavior (e.g., Arnould, Price, & Zinkhan, 2004; Evans, Jamal, & Foxall, 2006), conditioning is most often

described as a very simple, noncognitive learning process that involves changes in involuntary responses to stimuli as the result of the contiguity driven, unconscious formation of associations. In fact, this view corresponds largely to the behaviorist theories that dominated (learning) psychology more than forty years ago. During the past forty years, views on conditioning have changed dramatically. An abundance of evidence has shown that cognitive processes such as expectancy, attention, memory, awareness, and even reasoning play a crucial role in conditioning (e.g., Dawson & Schell, 1987; De Houwer, Vandorpe, & Beckers, 2005). But also many learning psychologists to some extent still carry with them the behavioristic stereotype of conditioning. Most importantly, even though they generally acknowledge the importance of mental representations and cognitive processes, many still cling to the assumption that conditioning is a process that involves the automatic, bottom-up formation of associations between mental representations (see De Houwer et al., 2005a, for a discussion). This is perhaps even more so for evaluative conditioning than for other types of conditioning because evaluative conditioning involves changes in a seemingly very primitive response, namely liking.

In my opinion, this view of evaluative conditioning hampers research not only because it is outdated, but most crucially because it defines evaluative conditioning in terms or a process rather than a procedure. I will argue that real progress in understanding evaluative conditioning can be made only if evaluative conditioning is defined as an effect and if one allows for the possibility that different kinds of processes can underlie evaluative conditioning effects (see De Houwer, 2007, for a more detailed discussion). As I will explain in the next sections, evaluative conditioning is an effect that undeniably occurs in human and non-human animals: It is beyond dispute that pairing stimuli can result in changes in the liking of those stimuli and for that reason, evaluative conditioning deserves much attention.

What can be disputed, however, are theories about the processes that might underlie evaluative conditioning effects. It is even likely that different types of processes can produce evaluative conditioning effects. This insight sheds new light on the many conflicting findings that have been reported in the literature on evaluative conditioning and opens the way for new research. If evaluative conditioning effects can be due to different processes, than not all manifestations of evaluative conditioning will have the same properties (i.e., occur under the same conditions). Hence, one should adopt a meta-conditional approach (De Houwer, 2007): Research should focus not only on whether evaluative conditioning effects have certain properties but also on the conditions that determine when evaluative conditioning has those properties. For instance, when studying extinction, the crucial question should not be *whether* evaluative conditioning effects show extinction (i.e., are no longer present when CS-US pairings are followed by repeated presentations of the CS in isolation) but *when* evaluative conditioning shows extinction and when not. Likewise, marketeers should decide not only whether they will implement an evaluative conditioning procedure. They should also take into account the conditions under which the evaluative conditioning procedure will be implemented because this could determine what effects the procedure will have (e.g., a change in liking that is or is not resistant to extinction). In sum, in order for psychologists and marketeers to truly understand and utilize the potential of evaluative conditioning, they need be more precise in their definition of evaluative conditioning and need to wake up to the fact that conditioning is not nearly as simple as commonly assumed.

In the next section, I will first try to clarify what it means to define evaluative conditioning as a procedure, an effect, or a theory. Afterwards, I will discuss possible processes that could underlie evaluative conditioning effects and use this to provide a starting point for meta-conditional research.

A conceptual analysis

Let us return to the example of the "have-a-Coke-and-a-smile" ads. To say that this is an example of evaluative conditioning can mean several things. First, it could imply that the marketeers behind the ad campaign use a *procedure* that is in essence identical to the procedure used in evaluative conditioning studies. Both in the ads and in lab studies, stimuli (e.g., a brand name and pictures of smiling people) are presented together in a certain manner and it is assessed whether this leads to changes in liking. [1] In this sense, evaluative conditioning simply refers to what a marketeer does. Because it refers to objective facts, there can be little discussion about whether a certain ad or study involves evaluative conditioning in the sense of a procedure.

Saying that the Coke ads provide an example of evaluative conditioning can also be understood in the sense that the pairing of the brand name and the smiling faces actually produces a change in the liking of the Coke brand. Evaluative conditioning is now understood to be an *effect* of the procedure rather than the procedure itself. It refers to the effect of the ads, not to the ads as such. More generally, evaluative conditioning as an effect refers to an actual change in the liking of stimuli that is due to the fact that stimuli were paired in a certain manner. It is important to note that observing a change in liking is not enough to claim that evaluative conditioning as an effect has occurred. A change in liking can be regarded as an evaluative conditioning effect only if the change is due to the pairing of stimuli. Assume, for instance, that the Coke ads result in an increased liking of Coke. It is possible that this increase in liking is due not to the fact that the Coke brand was paired with positive images but to the fact that the brand name was repeatedly presented to the consumers. From research on the mere exposure effect (for a review, see Bornstein, 1989), we know that the repeated presentation of a stimulus can result in an increased liking of that stimulus. If the increase in

liking for the brand is due to the repeated stimulus exposures, it would be wrong to label the change in liking as an evaluative conditioning effect.

Unlike to what is the case with evaluative conditioning as a procedure, evaluative conditioning as an effect thus entails more than a simple observation. Not only is it necessary to observe an objective change in liking, one also needs to be confident that the observed change can be attributed to the pairing of stimuli, that is, to an evaluative conditioning procedure. In the lab, one can check whether a change in liking is due to the pairing of stimuli by adding control conditions to the design of the study. For instance, one can compare the changes in liking for experimental stimuli that have been paired with positive stimuli with changes in liking for control stimuli that have been presented equally often as the experimental stimuli but that have not been paired with positive stimuli (see De Houwer et al., 2001, for a discussion of appropriate control conditions). If the liking of the experimental stimuli changes in a different way than that of the control stimuli, one can infer with a high degree of confidence that the change in liking of the experimental stimuli was due to the pairing with the positive stimuli and thus a case of evaluative conditioning as an effect. Outside of the lab, for instance in the context of real life advertising, it will often be difficult to implement the appropriate control conditions. In such cases, one should be aware that labeling a change in liking as an evaluative conditioning effect is actually based on a hypothetical causal attribution rather than on pure observation.

The third and final way in which the concept “evaluative conditioning” can be used, is in terms of a theoretical mechanism or process. As indicated above, many marketeers and psychologists explicitly or implicitly regard evaluative conditioning as an automatic, bottom-up, and low-level process that involves the formation and updating of associations between representations in memory. Regardless of the validity or merits of this particular view, one

should realize that it is very difficult to demonstrate that a change in valence is due to a particular process. Theoretical constructs such as processes cannot be observed directly. For instance, nobody has ever seen a representation or an association between representations. The problem would be solved if evaluative conditioning effects could be due to only one type of process. In that case, observing an evaluative conditioning effect would allow one to infer that the evaluative conditioning process has taken place. But it is impossible to determine on an a priori basis that there is only one process that can lead to evaluative conditioning effects. Evaluative conditioning effects could, at least in principle, be due to a variety of processes. Therefore, in order to conclude that "the" evaluative conditioning process has taken place, it is not sufficient to observe an evaluative conditioning effect. Hence, defining "evaluative conditioning" as a process has the important disadvantage that it become extremely difficult to determine when "real" evaluative conditioning has taken place (see De Houwer, 2007, for a more extensive discussion of this issue).

This analysis of the concept "evaluative conditioning" has important implications. First, given that there are three ways to define the concept "evaluative conditioning" (i.e., as a procedure, effect, or theory), it is crucial to always clearly specify the meaning that one is referring to. [2] Otherwise, conceptual confusion could lead to important misunderstandings. For instance, assume that future studies would demonstrate convincingly that evaluative conditioning effects can occur only when participants are aware of the presented pairings (see Pleyers et al., 2007, for recent evidence supporting that position). If evaluative conditioning is defined as changes in liking that are due to the automatic (in the sense of unconscious) formation of associations, such evidence will lead to the conclusion that evaluative conditioning does not exist. But this conclusion does not change the fact that the pairing of stimuli does lead to changes in liking. In other words, evidence against "evaluative

conditioning" defined as a particular process does not constitute evidence against "evaluative conditioning" defined as an effect. [3]

Second, the distinction between evaluative conditioning as an effect and evaluative conditioning as a process highlights the fact that several processes can be responsible for evaluative conditioning effects. Because of this, it could be that under certain conditions, evaluative conditioning effects have certain properties (e.g., resistant to extinction, no need for awareness) whereas under other conditions, they have other properties (e.g., no resistance to extinction, need for awareness). If this is true, learning psychologists *and* marketeers are faced with an important problem. Learning psychologists will fail in their aim to describe the properties of evaluative conditioning. For instance, sometimes researchers might find that evaluative conditioning is resistant to extinction and other times they might find that it does show extinction. Marketeers will therefore not know whether they can expect long lasting effects of their ads. In fact, the current literature on evaluative conditioning shows this kind of confusion. There now is general agreement about the fact that evaluative conditioning is a genuine phenomenon (an agreement that has been reached only recently; see De Houwer et al., 2005a). But there is little else that evaluative conditioning researchers agree about. For instance, in a recent special issue on this issue (De Houwer, Baeyens, & Field, 2005b), some researchers claimed that evaluative conditioning effects depend on contingency awareness, require attention, and do show extinction (e.g., Lipp & Purkis, 2005) whereas others argued that it does not depend on awareness, does not require attention, and is resistant to extinction (e.g., Walther et al., 2005). Such disputes render it impossible for marketeers to use evaluative conditioning in a scientifically informed manner.

The analysis presented in this chapter (also see De Houwer, 2007) sheds new light on these conflicting findings: It is possible that the effects observed in the different studies were

due to different processes. In the next paragraph, I will discuss two possible processes that could underlie evaluative conditioning effects, explain how this could explain some of the existing conflicting findings, and generate a number of new hypotheses that can be tested in future meta-conditional research.

Toward a meta-conditional approach

A dual process model

As mentioned above, many researchers have one particular kind of process in mind when they think about evaluative conditioning: The automatic formation and updating of associative links between representations. Let us return to the example of the "have-a-Coke-and-a-smile" ads. Because the Coke brand is paired with images of smiling people, it is assumed that the representation of the Coke brand in memory will become associated with the representation of smiling people or with the positive affect that is evoked by these smiling people. When people see the Coke brand after being exposed to the ads, this will activate the representation of smiling people or positive affect, leading to positive feelings. These positive feelings are then automatically misattributed to the brand. Different associative models differ in their assumptions about the type of representations that are associated (e.g., stimulus or response representations), the rules that govern the formation of associations (e.g., reduction of prediction error), and the conditions under which associations influence behavior (e.g., direct translation or comparison of different associations). But all are based on the idea that conditioning effects are based on the automatic formation and updating of associations in memory.

The current dominance of associative models in research on evaluative conditioning is perhaps not surprising given that such models have always been prominent in conditioning research. However, there is no a priori reason why evaluative conditioning effects can be due

only to association formation. Evaluative conditioning effects are by definition associative in nature (i.e., by definition due to procedure of the pairing of stimuli) but they are not necessarily due to the automatic formation of associations in memory. The pairing of stimuli can result in effects that are driven by processes other than the automatic formation of associations in memory. For instance, De Houwer et al. (2005a) pointed out that people might intentionally use conscious propositional knowledge about contingencies between stimuli as a basis for their evaluation of those stimuli. Assume that you receive an electric shock every time you see a picture of a triangle but never after seeing a picture of a circle. Afterwards you are asked to indicate how much you like the triangle and how much you like the circle. Probably you will say that you like the triangle less than the circle. When asked why, you can point to the fact that the triangle signals the shock as a justifiable reason for disliking the triangle. In a similar manner, consumers might justify their liking for the Versace brand by pointing out that their musical hero Madonna endorses Versace in ads. In these cases, the change in liking is due to the pairing of stimuli (i.e., the triangle and the shock or Versace and Madonna). Therefore, it is an evaluative conditioning effect. However, the change in liking it is not produced by automatic associative processes. Rather, it is a genuine change in liking that is based on the fact that people have acquired conscious propositional knowledge about the relation between the triangle and the shock (or Versace and Madonna) and that they used this knowledge as a basis for evaluating the triangle (or Versace). [4]

The proposal that evaluative conditioning effects can be based either on the automatic formation of associations in memory or the controlled use of conscious propositional knowledge boils down to a dual process model of evaluative conditioning. Similar dual process models have been proposed in many areas of psychology (e.g., Gawronski & Bodenhausen, 2006; Sloman, 1996; Strack & Deutsch, 2004) and it is clear that these models

are not without problems (e.g., Kruglanski, 2006; Moors & De Houwer, 2006). Nevertheless, they can be used as a source of inspiration for trying to understand when evaluative conditioning will have certain properties. Most importantly, these dual process models include assumptions about the conditions under which the two processes are likely to operate. For instance, the formation of conscious propositional knowledge about contingencies by definition implies awareness of the contingencies. Also, such knowledge is likely to reflect changes in contingencies such as those that occur during an extinction procedure. Hence, evaluative conditioning effects that are due to the use of conscious propositional knowledge about contingencies should depend on contingency awareness and be sensitive to extinction. Referring to the example given above, if people start liking Versace because they consciously learn that Versace is endorsed by Madonna, then there will be a strong relation between liking of Versace and conscious knowledge about the fact Madonna endorses Versace. Also, liking of Versace can be expected to disappear after people learn that Madonna no longer endorses Versace.

With regard to the automatic formation of associations, it is often assumed that associations can be formed independently of contingency awareness and reflect only the spatiotemporal contiguity between stimuli rather than the statistical contingency (e.g., De Houwer et al., 2001; Gawronski & Bodenhausen, 2006; Walther et al., 2005). Hence, evaluative conditioning effects that are due to the automatic formation of associations should not depend on contingency awareness and might not be sensitive to extinction. Returning to our example, if the liking of Versace is due to the automatic formation of an association in memory between the representations of Madonna and Versace, then it would be present even if people do not consciously know that Madonna endorses Versace (i.e., unaware evaluative conditioning) and might remain present after Madonna stops endorsing Versace (i.e.,

resistance to extinction). Which process is responsible for evaluative conditioning effects might thus have important implications for the properties of the effect.

Based on dual process models one could thus explain why the existing evidence regarding the role of extinction and contingency awareness in evaluative conditioning is mixed: In studies that provided evidence for extinction and against unaware evaluative conditioning, the conditioning effects might have been due to the acquisition of conscious propositional knowledge. Evidence supporting unaware evaluative conditioning and questioning the impact of extinction might have originated in studies where effects were due to the automatic formation of associations.

Implications for future research

Although this explanation of past conflicting results clearly is post-hoc, it does lead to interesting new predictions. Most importantly, it can be predicted that different properties might tend to co-occur. For instance, from the previous paragraph, it can be inferred that evaluative conditioning effects that do not depend on contingency awareness, might typically also be resistant to extinction. The reverse could also hold (i.e., evaluative conditioning that does depend on contingency awareness would show extinction). To the best of my knowledge, these predictions have not yet been tested in the literature. The reason probably is that researchers have until now regarded evaluative conditioning as a unitary process that has one fixed set of properties. From the viewpoint that two or more processes can produce evaluative conditioning effects, research should examine not only whether but also when evaluative conditioning has a certain property. The multiple process view thus implies a meta-conditional approach that attempts to identify clusters of properties that tend to co-occur (also see De Houwer, 2007).

Implementing such a meta-conditioning approach will not be easy. There are several

potential pitfalls that should be taken into consideration. First, past research has shown that it is not easy to establish whether evaluative conditioning has a certain property, that is, whether a certain condition (e.g., contingency awareness or absence of extinction trials) is important for observing evaluative conditioning effects. However, in the meta-conditional approach, the emphasis is not on how to establish that a certain condition is crucial but on whether the impact of different conditions is related. For instance, rather than trying to find a paradigm in which participants are completely unaware of the contingencies, it might be more useful to compare the properties of evaluative conditioning in situations where contingency awareness is poor (and propositional knowledge about stimulus properties can thus have little effect) with the same features in situations when contingency awareness is good (and propositional knowledge could have a strong effect). It might well be that extinction is more likely to occur in the latter situations. Also, it is striking that in some experimental set ups, there is a strong relation between contingency awareness and evaluative conditioning (e.g., Pleyers et al., 2007), whereas in other set ups the relation is absent or even negative (e.g., Baeyens et al., 1990b; Fulcher & Hammerl, 2001; Walther & Nagengast, 2006). Although such correlations do not allow for definite conclusions about unaware evaluative conditioning (e.g., De Houwer, 2001; Field, 2000; Shanks & St. John, 1994), it would be interesting to examine whether the conditioning effects in these set ups also differ with regard to other properties (e.g., extinction). If one can consistently observe that, for instance, extinction occurs when evaluative conditioning is strongly related to contingency awareness but not when evaluative conditioning is independent of contingency awareness, this would be a valuable observation regardless of whether one agrees that the criterion used for establishing the effect of extinction or the role of contingency awareness is the ultimate criterion. Moreover, if one can observe such a systematic link between the effect of different conditions, this could actually

be taken as evidence for the validity of the criteria that were used to establish the impact of the conditions (also see De Houwer, 2007).

A second potential pitfall of the meta-conditional approach is that specific predictions about clusters of conditions depend on multiple, often ill specified theoretical assumptions. The value of (the predictions of) the approach thus depends on the validity and specificity of the theoretical assumptions. For instance, it is often assumed that associative knowledge can be expressed automatically whereas propositional knowledge can influence behavior only in an intentional, controlled manner (e.g., Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004). Researchers have therefore looked for measures of stimulus valence that do not give participants the opportunity to take into account propositional knowledge about stimulus contingencies. In recent years, a number of tasks have been introduced that can be used to measure automatic affective reactions. These so-called implicit measures have attracted attention because they promise to provide a way of eliminating the impact of propositional knowledge on evaluative conditioning (e.g., De Houwer, Hermans, & Eelen, 1998; Hermans, Baeyens, & Eelen, 2003; Mitchell, Anderson, & Lovibond, 2003). This would imply that evaluative conditioning effects as registered by implicit measures provide an undistorted view on how associations are formed automatically.

Although the use of implicit measures in evaluative conditioning research could indeed provide an important step forward, researchers should be aware of the possibility that implicit measures can be influenced also by propositional knowledge. Recent research indeed suggests that at least certain implicit measures are not immune to propositional knowledge and are therefore not suitable as a pure index of association formation (De Houwer, 2006; also see De Houwer, Beckers, & Moors, in press). This example illustrates that one should always be aware that theoretical assumptions underlying (meta-conditional) research might

well be invalid. Such assumptions thus need to be tested empirically.

Summary and Conclusions

Humans and other organisms tend to want, do, and buy more often the things they like than the things they do not like. To understand and control human (consumer) behavior, it is therefore imperative that we understand how likes and dislikes are acquired. Evaluative conditioning research has shown that the preference for a stimulus can be influenced by pairing that stimulus with another stimulus. Understanding evaluative conditioning can thus provide many insights in human behavior. Unfortunately, we still do not know much about this important phenomenon. We know that it can work and that it can be successfully applied to change attitudes towards brands and products, but we also know that it does not always work. To make matters worse, the current literature on evaluative conditioning contains many conflicting results that have not been reconciled in a satisfactory manner. This makes it difficult for marketeers to decide whether or how to use evaluative conditioning in their practice.

In the present chapter, I have argued that progress in our understanding of evaluative conditioning is hampered by confusion regarding the meaning of the concept "evaluative conditioning". It can be used to refer to a procedure (i.e., pairing stimuli and checking whether this produces changes in liking), an effect (i.e., an actual change in liking as the result of pairing stimuli), or a theoretical process (i.e., the process by which pairing stimuli results in changes in liking). Problems arise when evaluative conditioning is defined in terms of a particular process. Not only is it difficult to determine whether a particular change in liking is due to a particular process (and thus to determine whether evaluative conditioning has occurred), such a view also tends to narrow theoretical thinking about evaluative conditioning in general. Most importantly, it detracts attention away from the possibility that

several processes can be responsible for evaluative conditioning effects, that is, for a change in liking that is due to the pairing of stimuli. It is therefore advisable to define evaluative conditioning in terms of an effect and to allow for the possibility that such effects can be due to different processes.

In the final part of this chapter, I put forward the hypothesis that evaluative conditioning effects could be due to at least two types of processes: The automatic formation of associations in memory and the controlled use of propositional knowledge about stimulus contingencies. I proposed this dual process hypothesis for two reasons. First, it sheds new light on the many conflicting results that have been reported in the literature: It might well be that the observed conditioning effects were in some cases due to one process and in other cases due to the other process. Second, the dual process hypothesis provides inspiration for meta-conditional research: Given certain assumptions, hypothesis can be generated about clusters of properties that might co-occur. For marketeers, such meta-conditional research could provide valuable knowledge about what to expect from evaluative conditioning.

Future empirical research will determine whether the dual process hypothesis has any merits. But regardless of the outcome of this research, the conceptual analysis presented in this paper makes clear that researchers should be open to the possibility that evaluative conditioning is not the simple phenomenon it appears to be. This should not discourage researchers from using or examining evaluative conditioning. There can be no doubt about the basic effect: The liking of a stimulus can be changed by pairing it with another stimulus. Evaluative conditioning procedures thus remain a powerful tool in the hands of marketeers and others who want to influence the liking of stimuli. But the usefulness of this tool will increase once we know more about when certain properties are important. The main message of this chapter is that these properties might well differ from situation to situation and that

researchers should try to uncover the variables that modulate the properties of evaluative conditioning.

References

Allen, C. T., & Janiszewski, C. A. (1989). Assessing the role of contingency awareness in attitudinal conditioning with implications for advertising research. *Journal of Marketing Research, 26,* 30-43.

Arnould, E., Price, L., & Zinkhan, G. (2004). *Consumers* (2nd ed.). New York, NY: McGraw-Hill/Irwin.

Baeyens, F., Crombez, G., Van den Bergh, O., & Eelen, P. (1988). Once in contact, always in contact: Evaluative conditioning is resistant to extinction. *Advances in Behaviour Research and Therapy, 10,* 179-199.

Baeyens, F., Eelen, P., & Van den Bergh, O. (1990a). Contingency awareness in evaluative conditioning: A case for unaware affective-evaluative learning. *Cognition and Emotion, 4,* 3-18.

Baeyens, F., Eelen, P., Crombez, G., & Van den Bergh, O. (1992a). Human evaluative conditioning: Acquisition trials, presentation schedule, evaluative style and contingency awareness. *Behaviour Research and Therapy, 30,* 133-142.

Baeyens, F., Eelen, P., Van den Bergh, O., & Crombez, G. (1989). Acquired affective-evaluative value: Conservative but not unchangeable. *Behaviour Research and Therapy, 27,* 279-287.

Baeyens, F., Eelen, P., Van den Bergh, O., & Crombez, G. (1990b). Flavor-flavor and color-flavor conditioning in humans. *Learning and Motivation, 21,* 434-455.

Baeyens, F., Eelen, P., Van den Bergh, O., & Crombez, G. (1992b). The content of learning in human evaluative conditioning: Acquired valence is sensitive to US-revaluation. *Learning and Motivation, 23,* 200-224.

Blair, M. E., & Shimp, T. A. (1992). Consequences of an unpleasant experience with

music: A second-order negative conditioning perspective. *Journal of Advertising, 21*, 35-44.

Bornstein, R. F. (1989). Exposure and affect. Overview and meta-analysis of research 1968-1987. *Psychological Bulletin, 106*, 265-289.

Brewer, W. F. (1974). There is no convincing evidence of conditioning in adult humans. In W. B. Weimer & D. S. Palermo (Eds.), *Cognition and the symbolic processes* (pp. 1-42). Hillsdale, NJ: Erlbaum.

Dawson, M. E., & Schell, A. M. (1987). Human autonomic and skeletal classical conditioning: The role of conscious cognitive factors. In G. Davey (Ed.) *Cognitive processes and Pavlovian conditioning in humans* (pp. 27-56). Chichester, UK: Wiley.

De Houwer, J. (2001). Contingency awareness and evaluative conditioning: When will it be enough? *Consciousness and Cognition, 10*, 550-558.

De Houwer, J. (2006). Using the implicit association test does not rule out an impact of conscious propositional knowledge on evaluative conditioning. *Learning and Motivation, 37*, 176-187.

De Houwer, J. (2007). A conceptual and theoretical analysis of evaluative conditioning. *The Spanish Journal of Psychology*.

De Houwer, J., Baeyens, F., & Field, A. P. (2005a). Associative learning of likes and dislikes: Some current controversies and possible ways forward. *Cognition and Emotion, 19*, 161-174.

De Houwer, J., Baeyens, F., & Field, A. (2005b). Associative learning of likes and dislikes. [A special issue of the Journal Cognition and Emotion]. Basingstoke, UK: Psychology Press.

De Houwer, J., Baeyens, F., Vansteenwegen, D., Eelen, P. (2000). Evaluative

conditioning in the picture-picture paradigm with random assignment of conditioned stimuli to unconditioned stimuli. *Journal of Experimental Psychology: Animal Behaviour Processes, 26,* 237-242.

De Houwer, J., Beckers, T., & Moors, A. (in press). Novel attitudes can be faked on the Implicit Association Test. *Journal of Experimental Social Psychology*.

De Houwer, J., Hendrickx, H., & Baeyens, F. (1997). Evaluative learning with "subliminally" presented stimuli. *Consciousness and Cognition, 6,* 87-107.

De Houwer, J., Hermans, D., & Eelen, P. (1998). Affective and identity priming with episodically associated stimuli. *Cognition and Emotion, 12,* 145-169.

De Houwer, J., Thomas, S., & Baeyens, F. (2001) Associative learning of likes and dislikes: A review of 25 years of research on human evaluative conditioning. *Psychological Bulletin, 127*, 853–869.

De Houwer, J., Vandorpe, S., & Beckers, T. (2005). On the role of controlled cognitive processes in human associative learning. In A. Wills (Ed.), *New directions in human associative learning* (pp. 41-63). Mahwah, NJ: Lawrence Erlbaum.

Dijksterhuis, A. (2004). I like myself but I don't know why: Enhancing implicit self-esteem by subliminal evaluative conditioning. *Journal of Personality and Social Psychology, 86*, 345-355.

Evans, M., Jamal, A., & Foxall, G. R. (2006). *Consumer Behaviour*. Chichester, UK: Wiley.

Field, A. P. (2000). I like it, but I'm not sure why: Can evaluative conditioning occur without conscious awareness? *Consciousness and Cognition, 9,* 13-36.

Field, A. P. & Davey, G. C. L. (1999). Reevaluating evaluative conditioning: A nonassociative explanation of conditioning effects in the visual evaluative conditioning paradigm. *Journal of Experimental Psychology: Animal Behaviour*

Processes, 25, 211-224.

Fulcher, E. P., & Hammerl, M. (2001). When all is revealed: A dissociation between evaluative learning and contingency awareness. *Consciousness and Cognition, 10*, 524-549.

Gawronski, B. & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin, 132*, 692-731.

Gorn, G. J. (1982). The effects of music in advertising on choice behaviour: A classical conditioning approach. *Journal of Marketing, 46,* 94-101.

Hermans, D., Baeyens, F., & Eelen, P. (2003). On the acquisition and activation of evaluative information in memory: The study of evaluative learning and affective priming combined. In J. Musch & K. C. Klauer (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (pp. 139-168). Mahwah, NJ: Erlbaum.

Kellaris, J. J., & Cox, A. D. (1989). The effects of background music in advertising: A reassessment. *Journal of Consumer Research, 16*, 113-118.

Kruglanski, A.W., Erb, H. P., Pierro A, Mannetti, L, & Chun, W. Y. (2006). On parametric continuities in the world of binary either ors. Psychological Inquiry, 17, 153-165.

Levey, A. B., & Martin, I. (1975). Classical conditioning of human 'evaluative' responses. Behaviour Research and Therapy, 4, 205-207.

Lipp, O. V., & Purkis, H. M. (2006). The effects of assessment type on verbal ratings of conditional stimulus valence and contingency judgement: Implications for the extinction of evaluative learning. *Journal of Experimental Psychology: Animal Behavior Processes, 32*, 431-440.

Lovibond, P. F., & Shanks, D. R. (2002). The role of awareness in Pavlovian Conditioning:

Empirical evidence and theoretical implications. *Journal of Experimental Psychology: Animal Behavior Processes, 28*, 3-26.

Meersmans, T., De Houwer, J., Baeyens, F., Randell, T., & Eelen, P. (2005). Beyond evaluative conditioning: Searching for associative transfer of non-evaluative stimulus properties. *Cognition and Emotion, 19*, 283-306.

Mitchell, C. J., Anderson, N. E., & Lovibond, P. F. (2003). Measuring evaluative conditioning using the implicit association test. *Learning and Motivation, 34*, 203-217.

Moors, A., & De Houwer, J. (2006). Problems with dividing the realm of cognitive processes. *Psychological Inquiry, 17*, 199-204.

Pleyers, G., Corneille, O., Luminet, O. & Yzerbyt, V. (2007). Aware and (dis)liking: Item-based analyses reveal that valence acquisition via evaluative conditioning emerges only when there is contingency awareness. *Journal of Experimental Psychology: Learning, Memory & Cognition, 33*, 130-144.

Razran, G. (1954). The conditioned evocation of attitudes (cognitive conditioning?). *Journal of Experimental Psychology, 48,* 278-282.

Rozin, P., Wrzesniewski, A., & Byrnes, D. (1998). The elusiveness of evaluative conditioning. *Learning and Motivation, 29,* 397-415.

Shanks, D. R., & St. John, M. F. (1994). Characteristics of dissociable human learning systems. *Behavioural and Brain Sciences, 17,* 367-447.

Sloman, S. A. (1996) The empirical case for two systems of reasoning. Psychological Bulletin, 119, 3-22.

Strack, F. & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*, 220-247.

Stuart, E. W., Shimp, T. A., & Engle, R. W. (1987). Classical conditioning of consumer attitudes: Four experiments in an advertising context. *Journal of Consumer Research, 14,* 334-351.

Till, B. D., & Priluck, R. L. (2000). Stimulus generalization in classical conditioning: An initial investigation. *Psychology & Marketing, 17*, 55-72.

Walther, E. (2002). Guilty by mere association: Evaluative conditioning and the spreading attitude effect. Journal of Personality and Social Psychology, 82, 919-934.

Walther, E., & Grigoriadis, S. (2004). Why sad people like shoes better: The influence of mood on the evaluative conditioning of consumer attitudes. *Psychology & Marketing, 21*, 755-773.

Walther, E., & Nagengast, B. (2006). Evaluative conditioning and the awareness issue: Assessing contingency awareness with the four-picture recognition test. *Journal of Experimental Psychology: Animal Behavior Processes, 32*, 454-459.

Walther, E., Nagengast, B., & Trasselli, C. (2005). Evaluative conditioning in social psychology: Facts and speculations. *Cognition and Emotion, 19*, 175-196.

Footnotes

1. As a procedure, evaluative conditioning is thus a form of classical conditioning: It is examined whether the pairing of stimuli influences reactions to those stimuli. What distinguishes an evaluative conditioning procedure from other classical conditioning procedures is that changes evaluative reactions are examined.

2. Note that the same holds for many other concepts in psychology. For instance, "priming" can be use to refer to a procedure of presenting prime stimulus before a related target stimulus, for the observed effect of presenting a prime before a related stimulus, or to the processes responsible for the priming effect (e.g., spreading of activation).

3. History teaches us that conceptual confusion can have serious consequences. For instance, in a highly influential chapter, Brewer (1974) reviewed evidence showing that classical conditioning in humans depends on awareness of stimulus contingencies. Based on this evidence, he titled his chapter "There is no evidence for classical conditioning in humans". Many researchers concluded on the basis of the title that conditioning *effects* are restricted to non-human animals and thus lost interest in the phenomenon. What Brewer really wanted to say, however, was that the behavioristic (S-R) theory of classical conditioning was incorrect. The conditioning effect as such (i.e., pairing stimuli can influence the responses of humans) was never in doubt.

4. Note that these changes are not due to demand compliance. Demand compliance also entails that people have conscious prospositional knowledge about the stimulus contingencies, but in the case of demand compliance, they use this knowledge because they

believe that this is what the experimenter or marketeer wants them to do. Both types of effect thus depend on the use of propositional knowledge about stimulus contingencies, but the knowledge is used for different reasons (i.e., to arrive at a genuine evaluation of the stimuli vs to comply with the expectations of the experimenter or marketeer; see Meersman, De Houwer, Baeyens, Thomas, & Eelen, 2005).

Author Note

Jan De Houwer, Ghent University. The preparation of this chapter was made possible by Grant BOF/GOA2006/001 of Ghent University. Correspondence should be addressed to Jan De Houwer, Ghent University, Henri Dunantlaan 2, B-9000 Ghent, Belgium. Electronic mail can be sent to Jan.DeHouwer@UGent.be . I thank Klaus Fiedler and Bertram Gawronski for comments on a first draft of the chapter.