Case Report

When the valence of unconditioned stimuli evolves over time: Evaluative conditioning with good-ending and bad-ending stories

Madelijn Strick*, Maarten Volbeda

Social, Health, & Organizational Psychology Department of Utrecht University, The Netherlands

A B S T R A C T

In most evaluative conditioning studies, the valence of the unconditioned stimuli is stable. We examined what happens when dramatic stories, of which the valence evolves over time, are used as unconditioned stimuli. In three experiments, we tested the hypothesis that the conditioning effect of stories depends on the valence of the ending, even when the beginning is of the opposite valence. Experiment 1 ($N = 61$) used a 2×3 within-participants design. Unknown consumer brands were paired with either good-ending or bad-ending stories, and the presentation of the brands was either before the beginning, before the ending, or after the ending. On both an implicit and an explicit attitude measure, we found that brands paired with good-ending stories were liked more than brands paired with bad-ending stories, and this effect was largest for brands presented after the ending. In Experiment 2 ($N = 131$), the explicit attitude results were replicated in a larger sample. In Experiment 3 ($N = 127$), the order of story segments was reversed such that the ending was told before the beginning. The conditioning effect was replicated and as in Experiment 1 and 2, the conditioning effect was largest for brands presented after the ending (now told first). We discuss the theoretical as well as practical implications of these findings.

1. Introduction

A large part of our knowledge and opinions about the world comes from stories. Novels, religious parables, news stories, and personal experiences are all examples of stories that may entertain as well as inform us. The idea that people can learn from stories is not new (cf. Green & Brock, 2000; Van Laer, De Ruyter, Visconti, & Wetzels, 2014). However, in this research we look at this issue from a novel perspective, namely, an evaluative conditioning perspective. Evaluative conditioning (EC) refers to a change in liking of a stimulus due to pairing it with another, typically positive or negative, stimulus (De Houwer, 2007; Gast, Gawronski, & De Houwer, 2012). EC represents a model of how people develop likes and dislikes in daily life (De Houwer, Thomas, & Baeyens, 2001). Likes and dislikes, in turn, are important drivers of human behavior, as people tend to approach objects they like, and avoid objects they dislike.

EC has been a thriving research topic in the past decades (for reviews see De Houwer, 2007; De Houwer et al., 2001; Gast et al., 2012). In a typical EC study, a neutral conditioned stimulus (from now on called CS, or its plural, CSi) is paired with a positive or negative unconditioned stimulus (US, USi), after which the liking of the CS is measured. Evidence for EC is found when the liking of the CS has

shifted in the direction of the US with which it was paired. The modality of the USi differed widely across EC studies. Visual stimuli were most common (e.g., pictures of liked or disliked objects or persons), but verbal, auditory, and taste/flavor stimuli were also common (Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010). Despite the different modalities, the USi had in common that they were typically stable in terms of positive or negative valence.

To complement these previous studies, we investigated whether stories can function as USi in a conditioning experiment. A story is a sequence of related events leading to a transition from an initial state to a later state or outcome (Bennett & Royle, 2004). As this definition illustrates, the valence of a story is not stable; it rather evolves from one valence to the next. We think it is important to investigate this issue because in daily life people often learn through sequences of related events that together form a story. For example, a person may wake up one morning with a terrible headache, not sure if she can pull off a presentation later that day. She may decide to take some vitamins. If her presentation goes excellent, her liking of the vitamins may increase, as they are associated with the positive outcome. If her presentation goes disastrous, her liking of the vitamins may decrease, as they are associated with the negative outcome.

Here, we examined stories with a dramatic structure. This is a

* Corresponding author at: Social, Health, & Organizational Psychology, Utrecht University, Heidelberglaan 1, P.O. Box 80.140, 3508 TC Utrecht, The Netherlands.
E-mail address: m.strick@uu.nl (M. Strick).

typical structure for traditional (e.g., parables, plays) and modern (e.g., advertisements, movies) cultural expressions. In the last centuries, scholars have proposed different views on the essential elements of dramatic structure. The Greek philosopher Aristotle (335 BCE/2015) advanced a three-part view consisting of the protasis (introduction), epitasis (the middle part, describing trials and tribulations of the protagonist), and catastrophe (resolution). Later, the German playwright Freytag (1863/1895) proposed a five-part view consisting of exposition, rising action, climax, falling action, and dénouement. Despite somewhat differing views on the essential elements, there is consensus that a dramatic story at least includes a protagonist, a basic conflict, and an outcome (Bennett & Royle, 2004). As the protagonist and outcome seem self-evident, we only explain the basic conflict in more detail. The basic conflict refers to a complication, dilemma, or struggle the protagonist(s) must resolve. It is a critical feature of any dramatic story. Consider, for example, the classic Romeo and Juliet story without a conflict. Romeo and Juliet would fall in love, their respective clans would immediately support their relationship, and they would get married. End of story. As the example illustrates, removing the conflict eliminates the drama. Moreover, the basic conflict dictates what constitutes a good or a bad ending. A good ending generally means the successful resolution of the basic conflict, while a bad ending generally means the unsuccessful resolution of the basic conflict.

Although stories evolve from one valence to the next, it makes sense to say that the outcome strongly determines its overall valence. Indeed, research shows that the ending is decisive in people's retrospective valence appraisal (Dalakas, 2006; Diener, Wirtz, & Oishi, 2001; Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993). Kahneman et al. (1993), for example, showed that people evaluate a longer painful experience with a relatively pleasant ending as more positive than a shorter painful experience without a relatively pleasant ending. As the proverb says: All's well that ends well. Therefore, one may predict that a good-ending story may function as a positive US, while a bad-ending story may function as a negative US. Consequently, we predicted that associating a CS with a good-ending story increases the liking of that stimulus, while associating a CS with a bad-ending story decreases the liking of that stimulus. However, an open question was whether the size of this EC effect depends on the timing of CS presentation, that is, whether the CS is presented at the beginning, before the end, or after the end of the story. This question pertains particularly to stories, as their valence progresses from a somewhat negative state (the basic conflict) to a negative or positive outcome.

A first possibility is presenting the CS at the beginning of the story. Most EC studies presented the CS before the US, so-called "forward conditioning". Forward conditioning fits an expectancy-learning account of EC, which holds that EC is based on the expectation that the CS *predicts* the US (Lipp & Purkis, 2005). Early EC studies indeed found stronger effects when the CS preceded instead of followed the US during the learning phase (Hammerl & Grabitz, 1993; Stuart, Shimp, & Engle, 1987). Later studies however, found no difference between these two conditions (Gast, Langer, & Sengewald, 2016; Kim, Sweldens, & Hütter, 2016; Mallan, Lipp, & Libera, 2008), nor did an extensive meta-analysis across 214 EC studies (Hofmann et al., 2010). In summary, although the evidence is mixed, EC researchers generally assume that EC is facilitated by presenting the CS before the US. This implies that presenting the CS before the beginning of the story should increase EC.

A second possibility is presenting the CS shortly before the story ending. This way, it is closer to the positive or negative outcome. Modern views on EC predict that greater temporal proximity between the CS and the US increases EC (e.g., Gawronski & Bodenhausen, 2006; De Houwer, 2014). However, there is no consistent evidence to support this claim. A recent study found some evidence that EC is larger with closer temporal proximity of the CS and US (Gast et al., 2016), but only when the CS and US were of a different modality (i.e., visual and sound). The meta-analysis by Hofmann et al. (2010), in contrast, found no evidence that temporal proximity moderates EC. Summarizing,

although consistent evidence is lacking, presenting the CS shortly before the end may facilitate EC because of the close temporal proximity to the valenced outcome.

A third possibility is to present the CS after the story ending, so-called "backward conditioning". It represents the structure of many TV advertisements. Indeed, a field study reported in Baker, Honea, and Russell (2004) indicated that 24% of the TV advertisements in the USA present the brand at the very end, whereas only 6% present it at the beginning of the advertisement. However, it is likely that this convention is not based on principles of conditioning, but on the intuition of creative directors of advertising agencies. In fact, an experiment by Baker et al. (2004) showed that TV advertisements were more effective in changing brand attitudes when the brand was revealed at the beginning rather than the end of the advertisements, which suggests that CSi should be presented early instead of late in the story to facilitate EC. However, the custom in most TV advertisements is still to reveal the brand at the end, perhaps for good reasons.

The present experiments had two goals. First, to investigate whether good-ending stories and bad-ending stories can serve as USi in a conditioning experiment. We predicted that associating CSi with good-ending stories would increase CS liking compared to associating CSi with bad-ending stories. Second, to explore whether EC depends on the timing of CS presentation. We compared three timing conditions: CS presentation before the beginning, before the end, or after the end of the story, without having clear a priori predictions about the consequences for EC. In Experiment 1, we measured EC using an implicit and explicit attitude measure; in Experiment 2 and 3 we only used an explicit attitude measure.

We disclose all measures, manipulations, and exclusions, as well as the method of determining the final sample size. Sample sizes were determined before any data analysis.

2. Experiment 1

2.1. Method

2.1.1. Participants and design

We used a stopping rule of a minimum of 60 participants with more participants being included if they could be recruited in the allotted period. The sample consisted of 61 Dutch students (34 females), $M_{age} = 21.95$ years ($SD = 3.31$). The study used a 2(story ending: good vs. bad) × 3(timing: before beginning vs. before end vs. after end) within-participants design. Correlations between the levels of the within-participant variables can be found in the Supplementary Online Material.

2.2. Materials

2.2.1. Stories

There were 10 good-ending and 10 bad-ending stories generated by the authors (see Supplementary Online Material for all stories). The stories had two segments. The beginning segment introduced a protagonist who experienced a conflict or struggle. The end segment presented either a good outcome or a bad outcome. The stories described different struggles, for example related to finance, health, or social relations. An example of a good-ending story is: "Herman's company went bankrupt ten years ago and he had to sell his house and car. Today, he is celebrating the five-year anniversary of his new profitable enterprise." An example of a bad-ending story is: "Bram's successful enterprise has been struck seriously in the economic crisis. He has had to fire all of his personnel and today he has finally been declared bankrupt."

Fifty Amazon M-Turk workers rated English versions of the 40 story segments on a scale from -3(*Very Negative*) to 3(*Very Positive*). Of good-ending stories, beginnings were rated as negative ($M = -1.78$, $SD = 0.53$), while ends were rated as positive ($M = 2.36$, $SD = 0.56$). Of bad-ending stories, beginnings were rated as negative ($M = -1.10$,