

The evaluation of green companies changes after remembering tip of the tongue experiences

Maria Stavraki¹, David Santos², Ana Cancela³, Blanca Requero² and Pablo Briñol²

¹ Universidad de Castilla La Mancha, ² Universidad Autónoma de Madrid and ³ Centro Universitario Villanueva

Abstract

Background: This research explores the extent to which attitudes towards an environmentally-friendly topic (a green company) are affected by a “tip of the tongue” (TOT) experience. **Method:** In this experiment, participants were first exposed to a description of a green company that elicited mostly positive or negative thoughts. As part of an apparently unrelated study, participants were then asked to describe an experience of TOT that either was or was not successfully resolved. The recalling task was independent from the thoughts about the company. Finally, participants reported their attitudes toward the green company for which they initially listed thoughts. **Results:** Participants who recalled resolving a TOT experience relied on their thoughts about the initial (unrelated) green company more in forming their evaluations than did participants who recalled an unresolved TOT experience. **Conclusion:** Attitudes can be affected by thinking about an unrelated past meta-cognitive experience.

Keywords: Tip of the tongue, meta-cognition, self-validation, persuasion, green company.

Resumen

La evaluación de empresas verdes cambia a partir del recuerdo de experiencias de la punta de la lengua. **Antecedentes:** la presente investigación explora en qué medida las actitudes hacia un tema relativo al medioambiente (una empresa verde) están afectadas por el recuerdo de una experiencia pasada del fenómeno de la “punta de la lengua” (tip of the tongue; TOT). **Método:** los participantes leyeron una descripción de una empresa ecológica diseñada para producir pensamientos positivos o pensamientos negativos hacia la misma. A continuación se pidió a los participantes que pensaran sobre situaciones pasadas en las que habían experimentado una experiencia de TOT que fueron capaces de resolver resuelta o que no pudieron resolver. Finalmente, todos los participantes indicaron sus actitudes hacia la empresa verde sobre la que habían listado pensamientos inicialmente. **Resultados:** los participantes que recordaron haber resuelto la experiencia pasada de TOT usaron más los pensamientos que tenían en ese momento hacia la empresa comparado con aquellos que recordaron una experiencia TOT que no fueron capaces de resolver. **Conclusión:** las actitudes pueden variar en función del recuerdo de experiencias meta-cognitivas pasadas, aunque sean sobre temas no relacionados.

Palabras clave: fenómeno punta de la lengua, meta-cognición, auto-validación, persuasión, empresas ecológicas.

On December 12th, 2015, representatives from 195 countries around the world met to establish common policies in order to deal with global climate change. Two years earlier, then president of the United States, Barack Obama, had placed climate change as one of his top presidential priorities. Given the undeniable importance of global warming, environmentally friendly actions are needed in governmental policies, industry, civic associations and individual households (van der Linden, Maibach, & Leiserowitz, 2015). Understanding attitudes toward companies with environmentally friendly policies is one of the key ingredients in this context (Gifford, 2011; Shafir, 2012).

As a consequence of the global concern about pollution, several companies in energy-intensive industries that exploit scarce

natural resources, as well as threaten the environment through potential pollution and other accidents (e.g., oil spills) attempt to boost their public image by focusing on environmental awareness. Demonstrating environmental awareness is considered an important characteristic in building a strong corporate brand (e.g., Bansal & Roth, 2000; Hillestad, Xie, & Haugland, 2010) and plays a role in improving customer attitudes based on distinctive ethical values. A company can be environmentally aware by engaging in different pro-attitudinal environmental activities such as recycling policies that signal strong awareness of environmental concerns in development, production, distribution, and marketing of products and services (Van Riel, 1995).

Importantly, not only are companies willing to act in socially responsible and environmentally aware ways, but academic research has also paid much attention to green-related issues in recent years, often focusing on green marketing (Fuller, 1999; Peattie, 1995) and green consumer behavior (e.g., Moreno, Corraliza, & Ruiz, 2005; Roozen & Pelsmacker, 1998; Schwepker & Cornwell, 1991). Using a meta-cognitive approach, the present

research examines attitude change toward a company that is environmentally friendly. Next, we describe this meta-cognitive framework.

Just as people can evaluate social and physical objects (such as green companies), so too can they evaluate their own thoughts and thought processes. This process of thinking about one's own thinking – namely, meta-cognition – involves a distinction between primary and secondary cognition (Briñol & DeMarree, 2012; Metcalfe & Shimamura, 1994). Primary cognition involves immediate associations between objects and traits (e.g., “I don't like this company”). On the other hand, secondary cognition refers to the reflective judgments that are made about primary cognitions and focuses on the perceived validity of people's thoughts (e.g. “I am not sure of whether I dislike this company”).

The topic of meta-cognition has received considerable theoretical and empirical attention in the past decade, and is considered as one of the top 100 topics of psychological inquiry (Nelson, 1992). Within the field of cognitive psychology, the study of meta-cognition has traditionally focused on how people monitor and control their own mental functioning, especially in the domain of memory (Ballesteros, 1999; Koriat & Goldsmith, 1996). One of the most prototypical examples of meta-cognition in the domain of memory is the “tip of the tongue” (TOT) phenomenon, which refers to the meta-cognitive experience in which a person is certain of their knowledge on a given topic, yet is momentarily unable to retrieve the specific information from memory (see Schwartz & Brown, 2014, for a review).

The TOT is a relatively common phenomenon (Heine, Ober, & Shenaut, 1999) that entails two basic components: a cognitive and a meta-cognitive one (Schwartz & Metcalfe, 2011). On a cognitive level, the TOT is related to the retrieval of information from memory, or more precisely, the failure of retrieval. On a meta-cognitive level, it refers to a reflection upon the cognitive level (Bacon, Schwartz, Paire-Ficout, & Izaute, 2007) or, more specifically, to the strong, sometimes, frustrating, feeling provoked by the inability to access the desired information that one knows to be stored in memory (Bacon et al., 2007; James & Burke, 2000; Schwartz, Travis, Castro, & Smith, 2000).

To date, the majority of research has focused on describing and examining its causes (e.g., Burke, MacKay, Worthley, & Wade, 1991; Harley & Brown, 1998). Research suggests TOT is a universal experience that usually happens once a week, increases with age, and can lead to priming of words related to the word people are looking for (Brown & McNeill, 1966; Schwartz, 1999; for a recent review, see Schwartz & Brown, 2014). Unlike previous work, the present research focuses on the effects of thinking about past TOT experiences that are unrelated to a person's evaluation of an environmental topic.

Our predictions are based on the idea that experiencing a TOT phenomenon can have both positive and negative effects. On the one hand, not being able to retrieve a mental representation from memory can be associated with feeling frustrated and uncomfortable (e.g., Bacon et al., 2007, Brown & McNeill, 1966). Although TOT can be an unpleasant experience because people cannot retrieve the information they want, it can also serve a positive function by alerting people to the possibility that the desired information is stored in memory (Schwartz, 2006). From this latter point of view, TOT could enhance the functioning of the retrieval system rather than indicate its failure (Schwartz & Metcalfe, 2011). Additionally, TOT may increase people's interest and curiosity for the unreachable information. It could even

indicate that people hold strong attitudes for the topic at hand (i.e., attitudes that are more impactful on behavior and more stable over time) or that they feel confident that they know the information they are looking for.

The resolution of a TOT experience can be even more complex than the mere experience of it. When the TOT experience is resolved by finally recalling the word or concept that was blocked in memory, people experience a sense of relief (e.g., Bacon et al., 2007). However, resolving it can also make people lose their interest in the task and become disengaged, the goal of retrieving the information has been accomplished (DeMarree et al., 2012; Efklikes, 2009). On the other hand, if the TOT experience is not resolved, people often remain in a negative and uncomfortable state (e.g., Litman, Hutchins, & Russon, 2005). In this case, however, people may continue being interested in the task and devote cognitive resources to resolving it (Zeigarnik, 1938), and thus maintain some enthusiasm in the pursuit of their goal. In the present research, we explore the extent to which people rely on their thoughts to form attitudes as a function of whether they recall resolved vs. unresolved TOT experiences. In order to examine TOT's effects on attitudes toward a green company, we will use a self-validation paradigm. According to the self-validation hypothesis, when people are thinking about a topic, it is not only the number and valence of these thoughts that determine the extent to which thoughts influence attitudes but also the confidence with which people hold their thoughts (Petty, Briñol, & Tormala, 2002). That is, increasing confidence in positive thoughts should lead to more favorable attitudes, while increasing confidence in negative thoughts should lead to more unfavorable attitudes. Any variable that increases confidence or liking for thoughts would increase reliance on those thoughts in determining attitudes (for a review, see Briñol & Petty, 2009; see also Paredes, Stavrakaki, Briñol, & Petty, 2013). When people trust the validity of their thoughts, the direction of those thoughts should be more predictive of attitudes compared to when people doubt their thoughts. The present study aims to explore to what extent recalling a resolved versus unresolved TOT past experience affects thought-reliance in subsequent attitude judgments and whether thought favorability is more predictive of attitudes under thought validity conditions.

As an example of this paradigm, Briñol and Petty (2003, experiment 4) asked undergraduates to think and write about their good or bad qualities as future professionals by using either their dominant hand (high confidence) or their non-dominant one (low confidence). Finally, participants made self-attitude judgments. Results indicated that using the dominant hand increased the impact of thoughts on attitudes (i.e. positive thoughts led to favorable self-attitudes and negative thoughts led to unfavorable attitudes) compared with the non-dominant hand (see Requero, Cancela, Santos, Díaz, & Briñol, 2015, for another recent example).

In the present study, participants were first exposed to a description of a green company that elicited either mostly positive thoughts or mostly negative thoughts toward the company. Next, participants were asked to think about past situations in which they had either resolved or not resolved a TOT experience. Finally, all participants reported their attitudes toward the green company for which they initially listed their thoughts. On the one hand, one can expect that asking people to recall a past TOT that was successfully resolved (vs. unresolved) will increase the use of ongoing unrelated thoughts because solving problems tends to be a pleasant experience. Alternatively, one could anticipate that

asking people to recall a TOT experience that was unresolved (vs. resolved) could lead to more thought usage because of the curiosity and interest associated with the search. We conducted an experiment to disentangle these two competing predictions.

Method

Participants

One hundred forty-three (143) undergraduate students (23 males, 119 females and one participant who did not indicate their gender, $M_{age} = 21.47$, $SD = 1.20$) at the Universidad Autónoma de Madrid were randomly assigned to the cells of a 2 (Argument Quality: Strong vs. Weak) \times 2 (TOT: Unresolved vs. Resolved) between-subjects factorial design.

Instruments

Argument Quality. Participants were presented with a message introducing a new company. The message was composed of either strong or weak arguments in favor of the firm. An example of the strong arguments was that the company invested a lot of money in renewable energies and used environmentally friendly policies to protect the planet. An example of a weak argument in favor of this firm was that the company was trying to project an environmentally friendly image by having several plants around the building.

Tip of the Tongue. Participants were asked to write about a time they had a TOT experience, where they thought they knew something but they could not recall it at the time. They were provided with examples of those types of experiences such as times in which they thought they knew but could not momentarily recall the name of a person they had met before or that of a famous actor, or the title of a song or movie. In order to highlight the frustrating discomfort that accompanies TOT, half of the participants were asked to recall episodes that they could not end up resolving. In contrast, in order to highlight the satisfaction associated with solving a problem, the other half of participants were asked to recall TOT experiences that they were finally able to solve by retrieving the searched answer. To the best of our knowledge, this is a new way of potentially inducing a TOT. Previous research in TOT has used different inductions, such as asking people to answer difficult general knowledge questions or to remember a target word after reading its definition (for a review, see Hofferberth-Sauer & Abrams, 2014). The purpose of the present study was not only creating a TOT phenomenon but also to randomly assign participants experience either the positive feeling of resolving a TOT or the negative one of not resolving it. For this reason, we relied on a common priming procedure widely used for inducing different psychological feelings (e.g., Briñol, Petty, & Barden, 2007; DeMarree et al., 2012; DeSteno, Petty, Wegener, & Rucker, 2000) and cognitive states (Briñol, Petty, & Stavraki, 2012).

Thought Favorability. Participants were instructed to list the thoughts that they had as they read the message about the green company. Ten boxes were provided to list up to 10 individual thoughts. They were told to write one thought per box and not to worry about grammar or spelling. At the end of the experiment, participants were presented with the thoughts they wrote again and asked to rate them as positive, neutral or negative toward the green company. An index of the valence of description-related thoughts

was created for each participant by subtracting the number of negative thoughts from the number of positive thoughts that he or she had listed. This difference score was then divided by the total number of message-related thoughts to compute the overall proportion of positive to negative thoughts.

Attitudes. Participants were asked to evaluate the green company using a series of three 9-point (1-9) semantic differential scales (i.e., bad-good, dislike-like, bad working environment-good working environment). Ratings on these items were highly intercorrelated ($\alpha = .84$) and were thus averaged to create one overall attitude index toward the green company. Higher values on this index indicated more liking of the green company.

Ancillary Measures. After the measure of attitudes, participants completed measures of perceived amount of thinking, attention paid to the message, perceived level of accuracy with which the questionnaire was completed, and concentration during the completion of the questionnaire.

Procedure

The experiment was described as a study on organizational behavior designed to examine working conditions in different companies. First, participants were asked to read a full description of a new environmentally friendly company. They read a favorable description of a green company composed by either strong or weak arguments. This manipulation was designed to lead people to generate mostly positive or negative thoughts about the green company. After reading about the company and listing their thoughts about it, participants were asked to describe a situation in which they had a tip of the tongue experience as part of an unrelated study. Specifically, participants in the no-resolution condition were asked to write about a situation in which they could not remember the name of somebody or the title of a song or movie that they knew and were not able to retrieve the name. In the resolution condition, they were asked to write about a similar situation but one in which they were eventually able to remember the name or title. Finally, all participants indicated their overall liking of the green company they read about at the beginning, completed some ancillary measures, were thanked, debriefed and dismissed.

Results

Thought Favorability. A 2 (Argument Quality: Strong vs. Weak) \times 2 (TOT: Unresolved vs. Resolved) ANOVA on participants' thought favorability revealed a main effect of Argument Quality, $F(1, 139) = 326.34$, $p < .001$, $\eta^2 = .701$. As predicted, participants rated their thoughts to be more positive in the strong arguments condition ($M = .59$, $SD = .05$) than in the weak arguments condition ($M = -.72$, $SD = .05$). This finding shows that the manipulation of thought valence was successful. As expected, there was no main effect of TOT and no interaction among the variables, $ps > .22$.

Attitudes. The 2 \times 2 ANOVA also revealed a main effect for Argument Quality such that participants who received the description with the strong arguments rated the green company as more favorable ($M = 7.54$, $SD = 1.02$) than those who received the description with the weak ones ($M = 4.12$, $SD = 1.33$), $F(1, 139) = 305.64$, $p < .001$, $\eta^2 = .69$. More critical to our primary concerns, the two-way interaction between Argument Quality and TOT was significant, $F(1, 139) = 8.32$, $p = .005$, $\eta^2 = .056$. As

illustrated in Figure 1, for participants who recalled a resolved TOT experience, those in the strong message condition formed more favorable attitudes toward the green company ($M = 7.77$, $SD = .99$) than did those in the weak message condition ($M = 3.76$, $SD = 1.11$), $F(1, 139) = 207.80$, $p < .001$, $\eta^2 = .599$. For participants who recalled an unresolved TOT experience, those receiving the strong message also reported liking it more ($M = 7.27$, $SD = 1.01$) than those receiving the weak message ($M = 4.41$, $SD = 1.44$), $F(1, 139) = 106.35$, $p < .001$, $\eta^2 = .433$, but the difference between strong and weak arguments was significantly smaller than that of participants who recalled a solved TOT experience. That is, the effect of argument quality on attitudes was significantly greater for participants who recalled a resolved TOT experience than for participants who recalled an unresolved TOT experience.

Furthermore, we predicted that participants in the resolved TOT condition would rely more on their thoughts when forming attitudes than participants in the unresolved condition. Regressing attitudes onto argument quality, TOT condition, and the thought favorability index, a marginally significant interaction emerged between the thought favorability index and the TOT condition, $B = .50$, $t(139) = 1.78$, $p = .077$. Consistent with a self-validation view, this interactive pattern revealed that, although participants' thoughts significantly predicted attitudes in the entire sample, the favorability of the thoughts was more closely associated with attitudes for participants in the resolved TOT condition ($B = 2.34$, $t(139) = 11.70$, $p < .001$) than for those in the unresolved TOT condition ($B = 1.84$, $t(139) = 9.37$, $p < .001$).

Ancillary Measures. No main or interaction effects emerged for any of the other items (i.e., perceived attention, concentration, accuracy, guessing, and amount of thinking), $ps > .13$.

Discussion

The findings of the present experiment revealed that recalling a TOT experience influenced the persuasive impact of thoughts generated previously on an unrelated topic. The difference between strong and weak arguments on subsequent attitudes toward the green company was significantly greater for resolved than unresolved TOT conditions. This pattern of results suggests that participants who recalled a resolved past TOT experience relied on their previously generated thoughts to a greater extent in forming their attitudes than those who recalled an unresolved

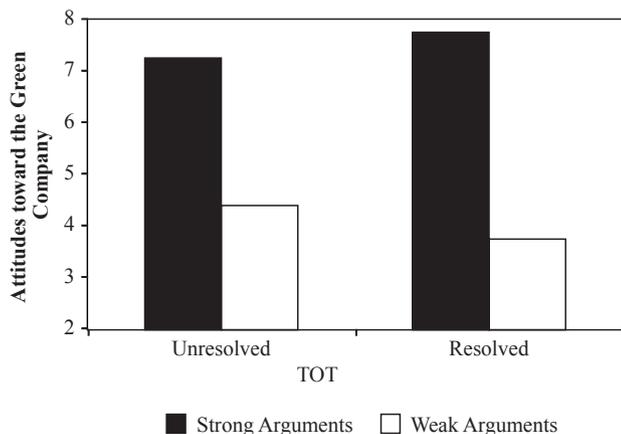


Figure 1. Attitudes toward the green company as a function of argument quality and TOT experience

TOT one. These findings provide support to our hypothesis that the positive feeling of relief associated with the resolution of a TOT phenomenon (rather than the potential curiosity inspired by the unresolved resolution) enhanced participants' reliance on their thoughts when forming attitudes toward the company.

Although this pattern of results is suggestive, it could be argued that recalling an irrelevant resolution (vs. the no-resolution) of a TOT operates as a negative cue or a negative bias, making participants evaluate the green company unfavorably. This interpretation is based on the fact that the TOT effect is more prominent in the negative than the positive thinking condition. A different take on the obtained results would be that recalling a successfully solved TOT experience increased further elaboration (rather than validation) about the described green company. Although plausible, this interpretation seems unlikely to account for the results for a number of reasons. First, motivation to think was set up as relatively high (rather than moderated or unconstrained) for all participants. Second, because the induction of TOT experiences followed (rather than preceded) the thought generation, it is unlikely that the thoughts generated in response to the green company were affected by something that did not take place until later. In fact, participants listed the same number of thoughts across conditions indicating that the elaboration was the same.

The current research has also some limitations, such that there are no manipulation checks to examine if people actually feel the positive feeling of relief in the resolved TOT condition and the negative feeling in the unsolved condition. Future research should include manipulation checks to ensure that the induction produces the intended feelings. In doing so, future studies should take into consideration that if the check items are presented to participants too early in the procedure (e.g., before the key dependent measures), it might sensitize them to the TOT experience and it could either eliminate the effects of the resolved TOT condition or make them so salient that people could correct for it. On the other hand, if the TOT experiences are measured late in the procedure, the effect of the resolved TOT condition might dissipate with time.

Future research could also examine whether individual differences such as need for cognition (Petty, Briñol, Loersch, & McCaslin, 2009), or the meaning people give to their experiences (Briñol, Petty, & Tormala, 2006) might moderate the observed results. For example, individuals who are high in need for cognition (i.e., people who enjoy effortful thinking) may enjoy the experience of an unresolved TOT because it involves a lot of cognitive effort and thus use their thoughts as a basis for their attitudes more in the unresolved TOT condition than in the resolved one. As it applies to the meaning people assign to their experiences, if someone possesses the naïve theory that resolving a TOT experience reflects an initial failure in memory, then recalling such an experience might result in less thought use than recalling an unresolved TOT experience.

Taken together, the present research adds value to the TOT literature by exploring for the first time the influence of thinking about a past resolved versus unresolved TOT experience on attitude change toward unrelated topics. To the best of our knowledge, this is the first time that TOT experiences have been studied in relation to persuasion. Our data indicate that recalling the experience of resolving a TOT phenomenon leads people to use their thoughts more to form subsequent attitudes than recalling the experience of being unable to resolve it. The current findings also contribute to

prior work on self-validation processes underlying attitude change. Along with the ease of retrieval (e.g., Tormala, Petty, & Briñol, 2002), the TOT experience is a novel memory process examined in the self-validation framework.

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