Persuasion at Different Levels of Elaboration: Experimental Effects of Strength, Valence and Ego Depletion

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Abstract

People are victims of consumer fraud and scams on a daily basis. However, in most cases, the victims could have detected the fraud if only they had checked for inconsistencies in the scammer's message. What makes some people detect and avoid a scam while others fall prey to it? This article investigates, in two experiments, the effects of ego depletion, issue involvement, need for cognition, and strength and valence of arguments on attitudes and attitude change. Experiment 1 tested the hypothesis that, in the case of high ego depletion, the participants' attitudes would be similar in both strong and weak argument conditions, whereas in the case of low ego depletion, their attitudes would be significantly more favorable in strong argument conditions. In Experiment 2, we hypothesized that participants' attitudes would follow the direction of the valence of the persuasive message presented to them. The results corroborated the hypothesis of Experiment 2 alone. Overall, the results indicate a low tendency for the participants to agree with the persuasive messages. Future studies could benefit from using different manipulations of the elaboration likelihood and from testing the persuasiveness of fraudulent messages.

Keywords: Persuasion, consumer behavior, elaboration likelihood model, ego depletion.

Persuasão e Níveis de Elaboração: Efeitos Experimentais da Qualidade, Valência e Esgotamento do Ego

Resumo

Pessoas são vítimas de golpes e fraudes contra o consumidor diariamente. No entanto, na maioria dos casos, a vítima poderia ter detectado a fraude se tivesse dado atenção para as inconsistências na mensagem do estelionatário. Por que algumas pessoas são capazes de detectar e evitar um golpe enquanto outras não? Este artigo investiga em dois experimentos, os efeitos do esgotamento do ego, do envolvimento com a questão, da necessidade de cognição, assim como a força e valência de argumentos sobre as atitudes e a mudança de atitude. O Experimento 1 testou a hipótese de que, sob um alto esgotamento do ego, atitudes seriam semelhantes em ambas as condições de argumentos fortes e fracos, enquanto sob um baixo esgotamento do ego, atitudes seriam significativamente mais favoráveis na condição de argumentos fortes. No Experimento 2, esperava-se que as atitudes dos participantes iriam seguir a direção da valência da mensagem persuasiva apresentada. Os resultados apenas corroboraram a hipótese do Experimento 2. Em geral, os resultados indicam uma pequena tendência dos participantes a concordar com as mensagens persuasivas. Pesquisas futuras poderão se beneficiar do uso de diferentes manipulações da probabilidade de elaboração e de testar o poder de persuasão de mensagens fraudulentas.

Palavras-chave: Persuasão, comportamento do consumidor, modelo de probabilidade de elaboração, esgotamento do ego.

Persuasión en Diferentes Niveles de Elaboración: Efectos Experimentales de Fuerza, Valencia y Agotamiento del Ego

Resumen

Las personas son víctimas de fraudes y estafas de consumidores a todos los dias. Sin embargo, en la mayoría de los casos, la víctima podría haber detectado el fraude si solo se verificaran las inconsistencias en el mensaje del estafador. Este artículo investiga en 2 experimentos los efectos del agotamiento del ego, de la participación del problema, de la necesidad de cognición, de la fuerza y valencia de los argumentos sobre la actitud y el cambio de actitud. El experimento 1 probó la hipótesis de que bajo un alto agotamiento del ego, las actitudes serían similares tanto en las condiciones de argumentos fuertes como débiles, mientras que bajo un empobrecimiento bajo del ego, las actitudes serían más favorables en la condición de argumento fuerte. En el Experimento 2 se esperaba que las actitudes de los participantes siguieran la dirección de la valencia del mensaje persuasivo. Los resultados respaldaron las hipótesis solo del Experimento 2. En general, los resultados indican una pequeña tendencia de los participantes a aceptar los mensajes persuasivos. La investigación futura puede beneficiarse del uso de diferentes manipulaciones de la probabilidad de elaboración y de probar la capacidad de persuasión de los mensajes fraudulentos.

Palabras clave: Persuasión, comportamiento del consumidor, modelo de elaboración de probabilidad, agotamiento del ego.

While trying to sell a product, salespeople may use a wide array of tactics to better persuade consumers. Often, consumers later on regret their purchase, feel deceived and ask themselves why they bought it in the first place – and in many cases, that was precisely the salesperson's intention. This phenomenon, deceptive persuasion, occurs when a persuasion agent fools his/her target by fabricating, manipulating or hiding information about a product or service, merely to better convince the target to purchase it (Boush, Friestad, & Wright, 2015). One type of deceptive persuasion is consumer fraud. In this case, the product may not exist, and the objective is not selling, but rather appropriating the target's money or personal information (Parodi, 2008). In most cases of consumer fraud, the information provided by a scammer, someone who is attempting to defraud others, contains a series of inconsistencies (e.g., inexistent companies,

prizes that are too good to be true, and false policies or laws) that could have been easily noticed by the victims had they scrutinized and fact-checked the message's content. However, many consumers fail to notice these scam cues and fall victim to scammers. What causes people to evaluate a persuasive message in different ways?

Many recent models in social psychology work with the idea that there are two types of thinking: one that is quick and more unconscious, and one that is slow and more deliberate (Evans & Stanovich, 2013). In a general sense, these so-called dual-process models explain that part of cognitive processing occurs outside of one's awareness, by dividing human cognitive processing into two sets of systems, usually named Type 1 and Type 2 (Fiske & Taylor, 2013). Psychologists use these models to understand how and why people overestimate the level of control over their own thoughts and behaviors. Type 1 processes work quickly and automatically, with little or no effort on the part of the individual. Such processes are more longstanding in human evolutionary history and are associated with tasks such as pattern recognition, emotion elicitation and other automatic processes (Stanovich, 2009). In contrast, Type 2 processes are slow and deliberate, demanding greater cognitive effort by the individual, and are considered to have emerged more recently in human evolution. Such processes are associated with the establishment of long-term goals, analytic processing, and the suppression of Type 1 processes.

Different cognitive costs are associated with each type of processing. Conscious control demands much more effort from the individual, especially when Type 2 processing must over-ride a Type 1 process (Evans & Stanovich, 2013). Evidence also suggests that cognitive resources for conscious processing are limited, and when drained, an individual experiences greater difficulty using Type 2 processing and relies more on automatic processing (Hagger, Wood, Stiff, & Chatzisarantis, 2010). This may lead to a higher frequency of errors and irrational decisions because, more often than

not, beliefs, attitudes and decisions are actually processed automatically and only later processed consciously, creating an illusion of control (Stanovich, 2013). However, Type 1 processes also lead to faster, better decision making in many situations, in the form of heuristics (Raab & Gigerenzer, 2015)

Heuristics can be defined as shortcuts used to simplify and facilitate judgment in situations involving little time for decision making (Fiske & Taylor, 2013; Gilovich, Griffin, & Kahneman, 2002). Such strategies rely on ignoring a piece of information in order to make decisions that are faster, more economical and more accurate, as compared to decision-making processes that are more complex (Gigerenzer & Gaissmaier, 2011). However, in many cases, these effort-saving strategies can result in less decision-making accuracy (Stanovich, 2012). For example, an ill-intentioned individual, armed with only a layman's knowledge of these characteristics of human thinking, can exploit Type 1 and 2 processing vulnerabilities in order to persuade and deceive a victim (Boush et al., 2015; Pratkanis & Farquhar, 1992). In fact, literature reviews (Muscanell, Guadagno, & Murphy, 2014; Pratkanis & Shadel, 2005) of the tactics used by scammers indicate that they frequently try to take advantage of people's quick decision making and lack of self-control (Langenderfer & Shimp, 2001).

Persuasion can be defined as a deliberate attempt to change the attitudes of another person (Petty & Cacioppo, 1984). The elaboration likelihood model (ELM) describes persuasion as an interaction between the agent and the target of persuasion, in which different individuals enjoy different levels of elaboration of the message that is presented, and can be persuaded via one of two routes (Petty & Briñol, 2014). When the target thoroughly analyzes, with great effort and elaboration, each argument presented in the persuasion message, it is said that he or she used the central route. On the other hand, when the target undergoes a change of attitude without analyzing each argument presented, with little effort and elaboration, he or she is considered to have taken the peripheral route. Because of

these two different forms of elaboration, the strength of a persuasive message's arguments can have less influence on one's attitudes if one is processing through a peripheral route (Teeny, Briñol, & Petty, 2017). Accordingly, if one's elaboration level is high (central route to persuasion), the strength of the arguments will be evaluated more thoroughly. The ELM is clearly a dual-process model created specifically to understand persuasion processes. While the central route may be considered Type 2 processing, the peripheral route can be considered Type 1 processing. The route used is determined by many factors, which include one's motivation to elaborate the message and one's ability to evaluate the arguments presented (Petty & Briñol, 2014).

Factors Influencing Elaboration Likelihood

Various factors are determinants of an individual's motivation and ability to process a persuasive message (Petty & Briñol, 2014). Among the factors that affect one's motivation is the issue involvement of the message's subject and one's need for cognition. When exposed to a message of great personal relevance, people tend to be more involved and thus more motivated to elaborate it. Petty and Briñol (2014) also demonstrated that the factors that influence one's ability to elaborate a message include the following: the presence of distracting variables, cognitive resources, and knowledge about the subject. In the presence of distracting elements during a persuasion attempt, a person may find it harder to elaborate the message and there will be a greater likelihood of using a heuristic to evaluate it (Teeny et al., 2017). An individual may lack cognitive resources because of limitations in his/her working memory span (Schmeichel & Hofmann, 2012). Such a lack of cognitive resources could hamper one's ability to think about the message, thus increasing one's likelihood of being influenced by peripheral cues of the message (Burkley, 2008; Wheeler, Briñol, & Hermann, 2007)particularly under effortful resistance (i.e., strong arguments. An ego depletion procedure can be used to influence the

participants' use of cognitive resources. Finally, a person who has knowledge about the subject matter of the persuasion attempt may be more motivated to elaborate it and can perform such elaboration with greater ease (Petty & Briñol, 2014).

Issue Involvement and Temporal Proximity

Issue involvement can be manipulated by changing the temporal proximity of the consequences of the message. Temporal proximity refers to how far in the future a persuasive message's consequences are, and it may influence the likelihood that an individual will elaborate the message in an effortful manner (Teeny et al., 2017). Furthermore, construal level theory (CLT) describes the relationship between different levels of construal and different psychological distances (Trope & Liberman, 2012). Thus, when contemplating an event that is distant in the future, a person will have a more abstract level of thinking and be less motivated to elaborate it. In contrast, an event that is bound to happen soon generates a more concrete level of construal and greater motivation to process a related persuasive message. It is reasonable to expect that, when presenting a non-trivial issue, manipulating the temporal proximity (close - distant) will affect levels of construal and the extent to which someone will think about the message presented. When faced with consequences that are far in the future, the strength of the arguments will have less effect on the participants (Petty & Cacioppo, 1984). As a side note, it is possible that individuals with a future temporal orientation may be less sensitive to this variable (Pimenta & Iglesias, 2014); however, studying the moderating role of temporal orientation goes beyond the scope of this paper.

Ego Depletion

According to the strength model of self-control (Baumeister, Bratslavsky, Muraven, & Tice, 1998), conscious and deliberative processes rely on a limited resource (as Type 2 processes)

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that, when exhausted, has a negative impact on one's executive function. This condition of diminished strength to exert self-control is called ego depletion (Hagger et al., 2010). Therefore, an individual with less self-control will have a harder time, for example, resisting acting on an emotion. Evidence suggests that self-control plays an important role in resistance to persuasion (Burkley, 2008) and that resistance to persuasion requires a capacity for self-control and self-regulation (Sripada, Kessler, & Jonides, 2014). Particularly important is the finding that impairment of self-control weakens one's ability to produce counterarguments, for it leads to less resistance to persuasion (Burkley, 2008; Wheeler et al., 2007)particularly under effortful resistance (i.e., strong arguments. It follows that a person experiencing ego depletion is less likely to properly elaborate a persuasive message. Such an individual will rely more on peripheral cues to evaluate the message and can thus be more easily persuaded by the presentation of weak arguments.

Need for Cognition

Need for cognition (NFC) is a cognitive style associated with enjoying and engaging in effortful thinking more frequently (Cacioppo, Petty, Kao, & Rodriguez, 1986). It is a relatively stable individual-difference variable that exhibits negative correlations with external locus of control and neuroticism and positive correlations with problem solving and objectivism (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Scoring higher on the Need for Cognition Scale is associated with engaging more frequently in deep thought, as well as enjoying reasoning and problem solving. Other studies also indicate that this cognitive style predicts analytical reasoning tendencies (Kokis, Macpherson, Toplak, West, & Stanovich, 2002) and critical thinking skills (West, Toplak, & Stanovich, 2008), even after controlling for general intelligence. In persuasion processes, need for cognition plays a moderating role, affecting an individual's motivation to elaborate the message presented (Haugtvedt & Petty, 1992). Hence, those who score higher on the Need for Cognition Scale are expected to

be more motivated to think about a persuasive message and evaluate its consistency, and thus more sensitive to the strength of the arguments presented.

Objective

We conducted two experiments aimed at investigating, in a Brazilian sample, the effects of ego depletion, temporal proximity, need for cognition, and strength (Experiment 1 and 2) and valence (Experiment 2) of arguments on a persuasion attempt, using the ELM as an explanatory model for attitudes and attitude change.

Experiment 1

Experiment 1 sought both to test participants' ability to resist persuasion when experiencing ego depletion and to ascertain the main effects and interactions between three independent variables, temporal proximity and message strength. It was expected that participants experiencing high ego depletion would be less likely to elaborate a persuasive proposal and would thus be more easily persuaded by weak arguments. These relationships are expressed in four hypotheses:

Hypothesis 1 – A strong argument condition produces attitudes that are more positive towards a proposal than those produced by a weak argument condition.

Hypothesis 2 – There is an interaction effect between temporal proximity and argument strength. Participants presented with a consequence far in the future tend to be less motivated to elaborate the arguments presented in a proposal and thus tend to have attitudes that are more positive towards the proposal. This effect should be stronger among participants in the weak argument condition (i.e., 'argument quality vs. temporal proximity' interaction).

Hypothesis 3 – There is an interaction effect between ego depletion and argument strength. Participants experiencing high ego depletion tend to be less motivated to elaborate the arguments presented in a proposal and thus tend to have attitudes that are more positive towards the

proposal. This effect should be stronger among participants in the weak argument condition (i.e., 'argument quality vs. ego depletion' interaction).

Hypothesis 4 – There is a three-way interaction effect between ego depletion, temporal proximity and argument strength. Participants presented with a consequence far in the future tend to be less motivated to elaborate the arguments presented in a proposal and thus tend to have attitudes that are more positive towards the proposal. This effect should be strongest among participants in situations involving both a weak argument and high ego depletion.

The Need for Cognition Scale was also employed, in order to control interindividual differences in tendency to engage in deep thought.

Method / Experiment 1

Participants

The present experiment enjoyed the participation of 128 volunteers (59.1% women) recruited on the campus of a major public university, with a mean age of 20.1 years ($SD = 2.2$). The sample was comprised of university students (90.6%) in 35 different majors. Sample size was determined based on the ability to detect an effect size of medium magnitude with a statistical power of .80 using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). The experiment employed a 2 x 2 x 2 independent factorial design. The variables were manipulated between subjects, and participants were randomly assigned to each of the three independent variables: strength of the arguments presented (strong vs. weak), ego depletion (high vs. low condition) and temporal proximity (close in time vs. distant).

Instruments

Independent Variables.

Argument Strength Manipulation. Two small texts advocating the establishment of a mandatory test at the end of all undergraduate courses were created by the research team. Participants were told that the text they would

read was a summary written by an unidentified professor of the university. Each text version presented four different arguments in favor of the proposal; the writing of these arguments was based on previous research (Petty, Harkins, & Williams, 1980). The weak-argument text contained poor arguments based on personal opinion (e.g., "I believe that students coming from universities that have this type of evaluation will find it easier to get a job"). The strong-argument text contained better-constructed arguments based on data (e.g., "Previous research indicates that the income of students coming from these universities is, on average, 30% higher. This difference remains even if other factors are considered, such as the reputation of the university..."). A pilot study with 43 participants was conducted to test this manipulation. The participants were randomly selected to read one of the two texts, answering questions about its difficulty, complexity and persuasiveness. The tests indicated that there were no statistically significant differences between the texts in terms of difficulty [$F(1, 41) = 2.36, p = .13, \eta^2 = .05$] or complexity [$F(1, 41) = .082, p = .78, \eta^2 = .002$] and that the strong-argument text was considered more convincing, $F(1, 41) = 3.95, p = .05, \eta^2 = .084$.

Temporal Proximity Manipulation. Temporal proximity (close in time vs. distant) was manipulated by informing the participants as to the period the test would be implemented. In the close condition, participants were informed that the test would begin to be mandatory as of the next year. Since all of the participants would graduate after the next year, they would thus be affected by this change. In the distant condition, participants were informed that the test would be mandatory in six years. All the participants were taking undergraduate courses that last 5 years or less.

Ego Depletion Task. The ego depletion task was inspired by the task employed by Wheeler et al. (2007)generation and application of contradictory information. In the first part, participants received a page with randomly generated letters and numbers, and were instructed to search for and cross out all the *e*'s that

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they could find on the page in less than 5 minutes. The second part included the manipulation of ego depletion (high vs. low). In the low ego-depletion condition, participants were simply instructed to repeat the first part of the task. In the high ego-depletion condition, participants received another copy of the same page and were instructed to repeat the task, yet with two new rules: First, they should not cross out *e*'s appearing after a vowel; and, second, they should not cross out *e*'s separated from another vowel by a consonant.

Covariate Variable: Need for Cognition. The Need for Cognition Scale (Cacioppo, Petty & Kao, 1984) is comprised of 18 items that describe preferences related to the tendency to engage in deep thought (e.g., "I prefer complex problems to simple problems"). Participants rate each item according to a five-point scale ranging from 1 (*Not characteristic at all*) to 5 (*Extremely characteristic*). In the present study, we employed a Brazilian version of the Need for Cognition Scale (Caldas et al., 2019). We then performed principal-axis factor analysis of the 18 items of the Need for Cognition Scale (KMO = .76). One factor had an eigenvalue above Kaiser's criterion of 1 and explained 19.13% of the variance. Again, a unidimensional solution was employed, but six items were excluded because they had factor loadings below .3 (α = .80).

Dependent Variables. Attitudes towards the proposal were measured in two ways: a semantic differential scale and two questions measuring attitude change.

Semantic Differential Scale. A seven-point semantic differential scale was created with eight pairs of adjectives used to evaluate the proposal (harmful/beneficial, good/bad, positive/negative, necessary/unnecessary, terrible/great, useful/useless, unpleasant/pleasant, and favorable/unfavorable). Participants responded to each of the eight pairs of adjectives by indicating how close their attitudes were to one of the extremes of the scale. In order to check whether the semantic differential scale was a reliable measure of attitudes, principal-axis factor analysis of the 8 items was conducted (KMO = .89). Only one

factor had an eigenvalue above Kaiser's criterion of 1 and explained 54.40% of the variance. A unidimensional solution was retained, with no items being excluded (α = .90).

Attitude Change. Two questions were used to measure whether there was any attitude change on the part of the participants. The first question was asked after explaining the proposal yet before participants read the persuasive text; it stated, "Before reading the text, please indicate, on the scale below, your response to the following question: What is your attitude in relation to the establishment of a mandatory test at the end of undergraduate courses?" The second question was posed after participants read the persuasive text; it stated, "Please indicate, on the scale below, your response to the following question: What is your attitude in relation to the proposal you just read?" Both questions were answered on a 5-point scale ranging from 1 (*Totally against*) to 5 (*Totally in favor*).

Procedures

Data Collection Procedures. After recruitment, participants were introduced to the experiment and randomly allocated to one of the two conditions of the ego depletion task. The task was presented as a "measure of attention." After completing the ego depletion task, participants read a short introductory statement affirming that a professor was proposing to establish a mandatory test at the end of undergraduate courses. After reading this proposal, yet before reading the persuasive text, participants were asked about their initial attitudes towards the proposal. The participants were then randomly assigned to one of the four conditions combining argument quality and temporal proximity. Participants in each condition received the corresponding version of the persuasive text. They were instructed to read it. After reading the text, they were asked about their attitudes towards the proposal. They were then given the semantic differential scale and the need for cognition scale. Upon completion, they were debriefed as to the real purpose of the experiment.

Data Analysis Procedures. The data were analyzed by means of descriptive and inferential procedures, including mean comparison tests by analysis of variance (ANOVA), and factor analysis. Initially, preliminary analyses were conducted to fit the assumptions of the statistical tests performed. Subsequently, a three-way independent ANOVA was carried out to test the hypotheses of Experiment 1.

Ethical Procedures. The authors certify that all data collection procedures in Experiment 1 complied with the ethical standards stipulated by Brazilian law, in accordance with Brazilian National Health Council Resolution No. 196/96. The research did not involve any sensitive issues, given the nature of the subject and the self-report procedures employed.

Results of Experiment 1

In order to measure attitudes towards the proposal, the average of the items of the semantic differential scale was computed (hereafter referred to as the "semantic differential variable"). In this measure, higher values indicate attitudes that are more positive. The covariate (need for cognition) proved to be significantly correlated with the participant's attitude [$F(1, 115) = 5.15$, $p = .025$, $\eta_p^2 = .04$]; however, none of the results differed after controlling for need for cognition. Since need for cognition did not alter the results, it was not used as a covariate in an ANCOVA model.

A three-way independent ANOVA was employed to test the effect of the three IVs on the semantic differential variable. A significant main effect of argument strength on attitudes toward the proposal was found [$F(1, 116) = 8.54$, $p = .004$, $\eta_p^2 = .07$], indicating that the strong argument generated attitudes that were more favorable ($M = .71$, $SE = .025$) than those produced by the weak argument ($M = .61$, $SE = .025$; 95% CIs [.66, .76] and [.56, .66], respectively). Neither temporal proximity [$F(1, 116) = 1.12$, $p = .29$, $\eta_p^2 = .01$] nor ego depletion [$F(1, 116) = 2.15$, $p = .15$, $\eta_p^2 = .02$] had a statistically significant effect on attitudes towards the proposal. Furthermore, there were no significant two-way interactions between the independent variables: argument

strength vs. ego depletion [$F(1, 116) = .62$, $p = .43$, $\eta_p^2 = .005$]; argument strength vs. temporal proximity [$F(1, 116) = 1.43$, $p = .24$, $\eta_p^2 = .012$]; and temporal proximity vs. ego depletion [$F(1, 116) = .034$, $p = .85$, $\eta_p^2 < .001$]. The three-way interaction (argument strength vs. ego depletion vs. temporal proximity) proved to be insignificant [$F(1, 116) = 1.87$, $p = .17$, $\eta_p^2 = .02$].

The attitude-change measure indicated that, overall, participants were more favorable towards the proposal after reading the text ($M = 3.71$, $SE = .097$, 95% CI [3.52, 3.90]) than before reading it ($M = 3.53$, $SE = .093$, 95% CI [3.35, 3.72]; $F(1 ,120) = 5.32$, $p = .023$, $\eta_p^2 = .042$). This result is further corroborated by a significant two-way interaction between argument strength and attitude change [$F(1, 120) = 14.62$, $p < .001$, $\eta_p^2 = .11$], indicating that the strong argument produced greater attitude change than did the weak argument. Neither temporal proximity [$F(1, 120) = 1.71$, $p = .19$, $\eta_p^2 = .01$] nor ego depletion [$F(1, 120) = .54$, $p = .47$, $\eta_p^2 = .004$] exhibited a statistically significant effect on attitude change. Furthermore, there were no significant interactions between the independent variables: attitude change vs. argument strength vs. ego depletion [$F(1, 120) = .082$, $p = .78$, $\eta_p^2 = .001$]; attitude change vs. argument strength vs. temporal proximity [$F(1, 120) = .73$, $p = .40$, $\eta_p^2 = .01$]; and attitude change vs. temporal proximity vs. ego depletion [$F(1, 120) = 1.28$, $p = .26$, $\eta_p^2 = .01$].

The assumptions for ANOVA were also tested, revealing no significant evidence of bias in any of the statistical models. Levene's test of homogeneity of variance indicated that the variances are roughly equal across the different combinations for the factors in the semantic differential variable [$F(7, 116) = 0.52$, $p = .82$]. An analysis of the Q-Q Plots indicated that the semantic differential variable was normally distributed across the different combinations.

Discussion of Experiment 1

As expected, argument strength was a predictor of attitudes, with strong arguments generating attitudes that were more positive than those produced by weak arguments. Need

for cognition was also found to be a significant predictor of attitudes. However, after controlling for it, there was no significant change in the model used to explain the results. It thus appears that, contrary to expectations based on the literature (Haugtvedt & Petty, 1992), need for cognition did not have a moderating effect on persuasion, because high-NFC individuals were affected in the same way that low-NFC individuals were. This could be a consequence of the dimensional structure of the NFC measure, which is different from that of the original study. On the other hand, this pattern may also suggest that, despite differences in need for cognition, the individuals were in general not motivated to elaborate the proposal presented.

The interaction effects described in Hypotheses 2 and 3 were also not found to be significant, and several possible explanations for this will now be examined. First of all, Hypothesis 2 describes an interaction effect, between temporal proximity and argument quality, on attitudes towards the proposal. The absence of this interaction effect indicates that, contrary to expectations based on the literature (Cacioppo et al., 1986), the temporal proximity of the consequences did not affect the manner in which participants elaborated the proposal in a detectable way. It is possible that the manipulation did not affect the personal involvement of participants, which means they were less motivated to elaborate the proposal. Second, Hypothesis 3 describes an interaction effect, between ego depletion and argument strength, on attitudes towards the proposal. The lack of such an interaction effect also goes against the literature (Burkley, 2008) particularly under effortful resistance (i.e., strong arguments, suggesting that the level of ego depletion did not affect the final generated attitude. This can also be explained by a lack of motivation to elaborate the proposal on the part of the participants, as that would lead to less use of conscious processes and make self-control resources less important (Teeny et al., 2017). Such limitations were not detected in time due to the lack of a pretest of the *ego depletion* and *temporal proximity* variables. Additionally,

no manipulation check for these variables was included in any of the experiments.

Another possible explanation for these results is that there could have been limitations associated with the ego-depletion task itself, although it was adapted directly from the original (Baumeister et al., 1998). Though not measured, resources for self-control may not have been affected by the task in a detectable way. Accordingly, in future studies, a manipulation check should also test this explanation. Nonetheless, a recent meta-analysis (Carter & McCullough, 2014) suggests that the literature on ego-depletion effect may suffer from publication bias. After correcting for small-study effects, Carter and McCullough found that the effect of ego depletion was not statistically different from zero. Hence, a better option could be to drop the ego depletion task in favor of another manipulation that affects working memory, such as a cognitive load task (Petty & Briñol, 2014; Schmeichel & Hofmann, 2012).

One final possible explanation relies on the observation that, overall, participants tended to have favorable attitudes towards the proposal ($M = 3.53$, $SD = 1.06$), even before reading the persuasive message, with only 21.1% of the participants being partially or completely against the proposal. It is possible that participants tended to simply agree with the proposal presented without thinking much about it, because that would require the least effort. Previous research suggests that the direction of an argument affects persuasion differently. When a participant is already in favor of a persuasive message, he will likely make less effort to think about the message (Briñol, McCaslin, & Petty, 2012). Experiment 2 was devised to test this explanation.

Experiment 2

Experiment 2 was designed as a follow up to Experiment 1, testing for a new effect: the valence of the proposal (i.e., favorable vs. unfavorable). In this experiment, valence refers to whether the persuasive text was in favor of or against the proposal. The objective was to investigate the main and interaction effects

between two independent variables: strength of the arguments and valence of the proposal. It was expected that participants' attitudes would tend to follow the direction of the valence of the persuasive proposal despite the strength of its arguments, as expressed in the two hypotheses below:

Hypothesis 1 — The valence of the proposal has a congruency effect on attitudes towards the proposal, whereby the valence of the attitudes follows the direction of the valence of the proposal.

Hypothesis 2 – There is an interaction effect between the valence of the proposal and the strength of the arguments. The congruency effect is greater in the strong argument condition, generating stronger positive attitudes in the favorable condition and stronger negative attitudes in the unfavorable condition.

Method / Experiment 2

Participants

The present experiment enjoyed the participation of 67 volunteers (60.6% women) recruited on the campus of a major public university, with a mean age of 19.8 years (SD = 3.48). The experiment employed a 2 x 2 independent factorial design. Participants were allocated to the two independent variables manipulated between subjects: strength of the arguments presented (strong vs. weak) and valence of the proposal (favorable vs. unfavorable). The size of the sample was calculated to detect an effect size as the main effect of the strength of the arguments in Experiment 1 and with a statistical power of .80 using G*Power (Faul et al., 2007).

Instruments

Manipulations of Argument Strength and Message Valence. The valence of the proposal was manipulated by introducing arguments against it. Accordingly, for this manipulation, two new short texts were developed, both of which employed the same structure of the texts used in Experiment 1. However, instead of

arguing in favor of the proposal, the new texts contained four arguments against it. The weak-condition text contained weak arguments, while the strong-condition text contained stronger arguments. Both of the pro-proposal texts (weak and strong) used in Experiment 1 were also used in Experiment 2, for the favorable condition. As in Experiment 1, participants were told that the text they were about to read was a summary written by an unidentified professor of the university.

Covariate Variable: Need for Cognition. The Brazilian version of the 18-item Need for Cognition Scale (Caldas et al., 2019) was also used in Experiment 2. Principal-axis factor analysis of the Need for Cognition Scale's 18 items was also conducted (KMO = .70). Again, a unidimensional solution was employed, yet three items were excluded because they had factor loadings less than .3 (α = .82).

Dependent Variable. Attitudes toward the proposal were assessed using both a semantic differential scale and two questions measuring attitude change.

Semantic Differential Scale. The same eight-item semantic differential scale used in Experiment 1 was administered to participants in Experiment 2.

Attitude Change. Attitude change was measured by way of the same two questions used in Experiment 1, and principal-axis factor analysis of the Differential Semantic Scale's 8 items was conducted (KMO = .899) A unidimensional solution was retained, and no items were excluded (α = .92).

Procedures

Data Collection Procedures. Participants were recruited in the classroom, and the experiment was performed collectively. Participants were informed that they would read and evaluate a short text. They then each received one of the four different versions of the instrument, randomly allocated between the two independent variables: argument strength and proposal valence. They were instructed to read the proposal and answer the entire instrument.

Lastly, a debriefing was conducted upon completion of the experiment.

Data Analysis Procedures. Data were analyzed by means of descriptive and inferential procedures, including means comparison tests by analysis of variance (ANOVA), and factor analysis. A two-way independent ANOVA was performed to test the hypotheses.

Ethical Procedures. As in Experiment 1, all data collection procedures in Experiment 2 complied with the ethical standards stipulated by Brazilian National Health Council Resolution No. 196/96.

Results of Experiment 2

A three-way independent ANOVA between attitude change, argument strength and proposal valence indicated that the participants' attitudes followed the direction of the proposal, with higher means for the favorable condition ($M = 3.50$, $SE = .23$, 95% CI [3.04, 3.96]) as compared to the unfavorable condition ($M = 2.80$, $SE = .22$, 95% CI [2.36, 3.24]), $F(1, 63) = 4.96$, $p = .03$, $\eta_p^2 = .07$. No two-way effect was found for either attitude change vs. proposal valence [$F(1, 63) = .53$, $p = .47$, $\eta_p^2 < .008$] or attitude change vs. argument strength [$F(1, 63) = .02$, $p = .88$, $\eta_p^2 < .001$]. Furthermore, no main effect was found for attitude change [$F(1, 63) < .001$, $p = .99$, $\eta_p^2 < .001$].

A two-way independent ANOVA was used to test the effect of the two IVs on the semantic differential variable. The valence of the proposal had a significant effect on attitudes toward the proposal [$F(1, 66) = 7.21$, $p = .009$, $\eta_p^2 = .10$], indicating that the favorable condition ($M = .66$, $SE = .04$) generated attitudes that were more favorable than those produced by the unfavorable condition [($M = .50$, $SE = .04$), 95% CIs [.55, .72] and [.45, .61], respectively]. Argument strength exhibited a marginally significant effect on attitudes toward the proposal [$F(1, 66) = 3.39$, $p = .07$, $\eta_p^2 = .05$]. There was no significant interaction between the two independent variables [$F(1, 66) = 1.73$, $p = .19$, $\eta_p^2 = .03$]. When need for cognition was entered into the model, it did not exhibit a significant correlation with participant attitude. Levene's test of homogeneity of variance indicates that the variances in the semantic differential variable are roughly equal across the different combinations for both factors [$F(3, 62) = 0.51$, $p = .68$]. Analysis of the Q-Q Plots suggests that the semantic differential variable was normally distributed across the different combinations for both factors.

Discussion of Experiment 2

Hypothesis 1 was confirmed by the fact that an effect of the valence of the proposal on attitudes toward the proposal was found. Participants tended to agree with what was argued in the persuasive proposal even before reading it. This trend was also observed in the participants' attitudes after reading the arguments. Furthermore, the interaction effect between proposal valence and argument strength on attitude change supports Hypothesis 2, that is, that stronger arguments generate even stronger attitudes in the direction of the proposal's valence. In other words, participants exposed to the favorable arguments had a stronger positive attitude change in the strong argument condition, while participants exposed to unfavorable arguments had a stronger negative attitude change in the strong argument condition. These results support the notion that participants may have had little motivation to elaborate the proposal and tended to agree with what was proposed without thinking much about it. While this effect may have occurred because it is the lowest cost option, it could have been intensified by the description of the text's author as a professor and former dean of the university. The power of authorities has long been observed in the literature (for an extensive review, see Cialdini & Goldstein, 2004). The mention of the professor, an authority figure, may have acted as a peripheral cue, guiding a peripheral attitude change (Briñol, Petty, Durso, & Rucker, 2017). With little participant motivation to elaborate the proposal, the professor's status could have had more weight on the evaluation, acting as a heuristic.

Need for cognition was not found to be a significant predictor of attitudes, and after controlling for it, there was no significant change in the linear model used to explain the results. As in the case of the results found in Experiment 1, this could be a consequence of the differences from the NFC's original dimensional structure. However, this result could also be explained by the possibility that, in a low personal-relevance situation, need for cognition alone is not sufficient to motivate participants to elaborate the proposal presented.

General Discussion

The two experiments described here sought to investigate the effects of ego depletion, issue involvement, need for cognition, and argument valence on a persuasion attempt. Overall, small to medium effect sizes of strength and valence of arguments on attitudes were found. While the literature concerning the elaboration likelihood model is uncertain as to the attitude-change effect sizes to be expected (Petty & Briñol, 2014; Teeny et al., 2017), the effects we found indicate at least a subtle change in the participants' attitudes. However, no effects of ego depletion or issue involvement on attitudes were found. We thus recommend two main courses of action for future experiments: First, a more effective manipulation of personal relevance needs to be devised, which means finding a way to make participants feel a strong personal impact of the proposal's consequences. Another possibility would be to modify the proposal itself so as to elicit greater motivation. Second, a future study should also test the interaction of a cognitive load task with the independent variables of Experiment 2. Nonetheless, such strategies might not be effective, given that some authors have called attention to certain limitations in relation to the ELM's replicability, particularly in the case of online media (Kitchen, Kerr, Schultz, McColl, & Pals, 2014).

Results from this type of research could have many potential applications to benefit consumers and provide them with psychological tools for self-protection (Boush et al., 2015). Large amounts of money are invested in the development of fraud prevention technologies, yet, at the same time, the social bases of fraud continue to be insufficiently tackled. ELM-based research findings can be useful to better understand which self-protection skills are worthwhile for consumers to protect themselves against fraud. This could aid the development of heuristics that contribute to recognizing and avoiding deceptive advertising (Harrison, Svetieva, & Vishwanath, 2016). Finally, in collaboration with legal research, future findings could be useful for detecting tactics that disrupt a consumer's Type 2 processing and could help push for legislation that takes such vulnerabilities into account (Demaine & Cialdini, 2016).

Authors' Contributions

Substantial contribution in the concept and design of the study: Lucas Caldas, Fabio Iglesias, Izabella Mello, Renan Lyra.

Contribution to data collection: Lucas Caldas, Izabella Mello, Renan Lyra.

Contribution to data analysis and interpretation: Lucas Caldas, Fabio Iglesias, Izabella Mello, Renan Lyra.

Contribution to manuscript preparation: Lucas Caldas, Fabio Iglesias.

Contribution to critical revision, adding intelectual content: Lucas Caldas, Fabio Iglesias, Izabella Mello.

Conflicts of interest

The authors declare that they have no conflict of interest related to the publication of this manuscript.

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