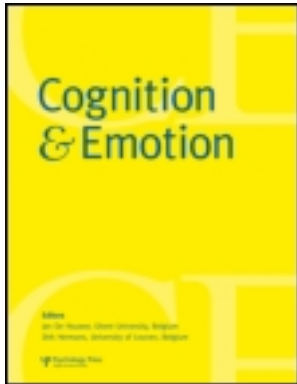


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BRIEF REPORT

Affect intensity and processing fluency of deterrents

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The theory of emotional intensity (Brehm, 1999) suggests that the intensity of affective states depends on the magnitude of their current deterrents. Our study investigated the role that fluency—the subjective experience of ease of information processing—plays in the emotional intensity modulations as reactions to deterrents. Following an induction phase of good mood, we manipulated both the magnitude of deterrents (using sets of photographs with pre-tested potential to instigate an emotion incompatible with the pre-existent affective state—pity) and their processing fluency (normal vs. enhanced through subliminal priming). Current affective state and perception of deterrents were then measured. In the normal processing conditions, the results revealed the cubic effect predicted by the emotional intensity theory, with the initial affective state being replaced by the one appropriate to the deterrent only in participants exposed to the high magnitude deterrence. In the enhanced fluency conditions the emotional intensity pattern was drastically altered; also, the replacement of the initial affective state occurred at a lower level of deterrence magnitude (moderate instead of high), suggesting the strengthening of deterrence emotional impact by enhanced fluency.

Keywords: Emotional intensity; Deterrent; Processing fluency.

Brehm (1999) developed a theoretical account—the theory of emotional intensity—specifically aimed at explaining the variations of affective states intensity as reactions to the context. Suggesting a functional analogy between affective and motivational phenomena, Brehm (1999) proposed that emotional intensity varies as a cubic function of deterrents. According to the theory, any event which, in that particular context, represents a reason for the individual not to feel the emotional state he is currently experiencing is

conceived as a deterrent for the respective state. More precisely, deterrents are factors which interfere with the subjective experiencing or with the behavioural manifestation of a previously instigated emotion. In the typical experimental scenario, an affective state is first induced; the set of affective states which have been shown to manifest intensity variations in line with the theory includes happiness (good mood), sadness, sympathy, anger, as well as sensory affect. Second, participants in the experimental groups are

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exposed to a deterrent of variable magnitude, either small, moderate or strong; lastly, the participants' current affective state is investigated. As the experimental evidence relevant to the theory has shown, reasons for feeling a different emotion than the previously instigated one affect the intensity of the latter: receiving a gift certificate is a deterrent for the current state of sadness (Brehm, Brummett, & Harvey, 1999) and anger (Miron, Brummett, Ruggles, & Brehm, 2008), while news of future college tuition rises deter positive affect (Brehm, 1999). Moreover, deterrents are not necessarily events calling for an opposite emotion to the one currently experienced, but merely stimuli competing for attention with it and, consequently, interfering with its function. Thus, the concept of deterrence is not confined to emotional opposites, but includes all events which are incompatible with the current affect, an idea supported by results showing that affective states can be also deterred by non-emotional factors in the same manner as by emotional ones. For example, the sadness instigated by listening to a sad story recorded on tape is deterred by the background noise on the recording (Silvia & Brehm, 2001).

The general effect of deterrents on the affective state that had been instigated before depends on their magnitude. Across the various groups defined by deterrence magnitude, the theory predicts a cubic trend. First, in the absence of any contextual deterrents, the intensity of an existing emotion is at its highest level, as induced by its instigating event; thus, affective states monopolise the organism's resources in order to cope with the instigating event. In the presence of a minor deterrent, it drops to a low level; but this drop does not reflect a shift in priorities from the first emotional event to the current one, resulting in emotional dissipation. Instead, this intensity lowering is the manner in which the organism rationalises its resources while still focusing on achieving the goal of the previously instigated emotion. When confronted with small impediments, this focus can be kept even with a low investment of psychological resources, which translates into a low emotional intensity. Thus, the principle in dealing with deterrents, as stated

by this theory, is that up to a level of deterrence magnitude the initial emotion becomes as intense as necessary in order to maintain behavioural control. This creates a particular relationship between deterrence magnitude and the subsequent emotional intensity, which might seem somewhat paradoxical or at least very different from the common sense expectations on these phenomena: the stronger the reasons for not feeling an emotion, the more intense that emotion will become. In other words, the results so far have shown that the initial affective state intensifies as the deterrent gains in strength. In the typical experimental design described above, this relationship is captured by the comparison between the emotional intensities reported by the participants in the small deterrence and moderate deterrence conditions, with the latter experiencing the initial affective state with higher intensity than the former. For instance, in the Brehm et al. (1999) study, following the induction of sadness and the exposure to deterrents in form of the gift certificates received, the participants given a \$2 gift certificate became sadder than those who received a \$1 gift certificate. This direct proportionality between the two exists up to a certain point where the magnitude of deterrence overcomes the importance of the event that instigated the initial affect. When encountering a deterrent stronger than the instigating event, the initial emotion dissipates, being replaced by the affective state induced by the deterrent (in the case of emotional deterrents).

According to the theory, these differences in emotional intensity represent ways in which the emotional system rationalises the use of resources when dealing with deterrents of various magnitudes. Apart from this functional account, the theory contains few references to other psychological dynamics involved in this permanent adaptation of affective states to the context. Specifically, whether these emotional changes imply some correspondent variations in the way deterrents are apprehended by the individual remains an open question. The cognitive consequences of affective states are invoked in the initial formulation of the theory (Brehm, 1999) only as tools

employed by the emotional system in order to attain its goal, without any further conceptualisation on the topic. Nevertheless, in light of the various cognitive consequences of emotions which have been documented, a hypothesis concerning a cognitive dimension of these paradoxical affective dynamics seems legitimate.

Among such potential cognitive mediators might be included the selective attention to emotional-consistent information (Forgas & Bower, 1987) or the judgement effects of affective states documented in the affect-as-information approach (Schwarz & Clore, 2007). These direct consequences of pre-existing affect on the processing of the stimuli which, according to the theory, function as deterrents can also be inferred from the results of recent studies (Brehm, Miron, & Miller, 2009; Miron, Parkinson, & Brehm, 2007), which found that participants' evaluations of deterrents were related to the intensity of the pre-existent affective state. For instance, in the Brehm et al. (2009) study, after the instigation of positive affect, participants being told about an 8% tuition increase (the moderate deterrent) evaluated this information as having the same negative personal impact as those learning of a 2% increase (the low deterrent). Thus, the current affective state prevents significant variations in the evaluation of psychologically incompatible events. Only when the magnitude of these deterrents overcomes the threshold set by the importance of the emotional event does their evaluation becomes more attuned to it: for example, in the above-mentioned study, participants told about a 16% tuition increase gave significantly worse evaluation of this information than the other two groups. Although they were not conceptualised as direct processing effects in the studies reporting them, such evaluative variations can be considered, at least in part, as reflecting cognitive means through which emotional states resist deterrence, more specifically as judgement effects of the current emotion: the more intense positive affect in the "moderate deterrence" condition diminishes the subjective impact of the negative deterrent to the same level as that reported by the participants

in the "low deterrence" condition, who are experiencing lower intensities of positive affect.

These effects could be also facilitated by another cognitive mechanism involved in the resistance of affect when confronted with deterrents, namely the limitations in cognitive processing of deterrents as a result of their low current subjective relevance. In order to withhold the potential affective impact of any encountered event, its initial cognitive processing could be limited to the rapid general assessment of its correspondence to the goals of the current emotional state and, in case of those incompatible with the current emotional goals, of their magnitude. When the latter does not exceed the importance of the affect instigating event, since the actual content of the deterrent doesn't fit the individual's current motivational focus, it becomes, from the subjective standpoint, less relevant in that particular context. As a result, it is shifted out of the current attentional focus, the mental investment in its processing being limited, while the cognitive system concentrates on the elements that concur to the function of the affective state.

The present study was built upon this presupposition of a specific motivationally-induced cognitive approach on deterrents, functioning as a mechanism through which affective states resist them: the imposition of a mental set which renders them as having lower current subjective relevance, consequently receiving a more superficial cognitive treatment. Further, we assumed that one specific cognitive phenomenon—processing fluency—might alleviate this effect and diminish the emotional resistance to deterrents.

Processing fluency refers to the subjective experience of ease or difficulty generated during mental tasks, and it represents one of the most important metacognitive cues used in reasoning (Oppenheimer, 2008). While many varieties of fluency have been documented, which influencing a variety of psychological aspects (Alter & Oppenheimer, 2009), the present study focused on perceptual fluency (e.g., Reber & Schwarz, 1999), referring to the ease of stimulus processing in identifying its physical identity and form. Perceptual fluency can be manipulated, among

others, through figure–ground contrast, presentation duration, priming (Reber, Winkielman, & Schwarz, 1998) previous exposure (Jacoby, 1983) or font legibility (Oppenheimer, 2006).

According to the discrepancy-attribution hypothesis (Whittlesea & Williams, 1998), fluency is further interpreted as familiarity only when the experienced ease of processing exceeds the one expected in the given situation. Furthermore, two theoretical accounts have been developed to deal with this issue of fluency interpretation. The hedonic marking theory (Winkielman & Cacioppo, 2001) draws upon a series of experimental results indicating that fluency by itself generates genuine positive affect and directly facilitates positive evaluations. The opposite, “cold” account suggests two steps of fluency interpretation: first, fluency is elicited as a neutral, non-specific experience, then is interpreted by attributing it to the source deemed as appropriate. It becomes a cue for the relevant judgements at hand (Unkelbach, 2006), with various influences depending on its perceived validity, on individual’s naïve theories (Winkielman & Schwarz, 2001). When not discounted by its attribution to an alternative source, it can inform the individual on various characteristics of the stimulus (truth, valence, fame, etc.), being capable of shifting judgements towards both ends of the dimension apprehended, both in non-evaluative judgements (for instance, brightness vs. darkness, as in Mandler, Nakamura, & Van Zandt, 1987) as well as in evaluative ones (positive vs. negative, as in Reber et al., 1998).

Some of the consequences of fluency on subsequent information processing are particularly relevant in the context of the motivationally mediated dynamics of emotional intensity. The general link between motivation and processing fluency has been highlighted by previous results showing that messages matching the individual’s motivational focus (prevention or promotion) are processed more fluently (Lee & Aaker, 2004). Other results suggest that the two might also have combined effects, as fluency might influence the subjective relevance of the currently processed items and, consequently, their role in the

individual’s motivated cognitive processing. First, studies indicate a general enhancing effect of fluency on the perceived importance of the respective information, for instance in terms of economic value or purchasing power (Alter & Oppenheimer, 2008) or objective importance (Labroo, Lambotte, & Zhang, 2009). Moreover, this importance-enhancement effect is not limited to the mere evaluation of the fluently processed stimulus, but it also extends into the individual’s further mental operations. In this respect, Shah and Oppenheimer (2007) showed that fluency increases the impact of the respective piece of information in judgement: people place more weight on perceptually fluent cues in their overall evaluations of a target. These results suggest that fluency enhances not only the intrinsic importance of the stimulus, but also its relevance for the current cognitive task. In this perspective, in the Shah and Oppenheimer (2007) experiment, the fluency-enhanced relevance led to participants’ stronger reliance on the respective piece of information in their overall judgement. Furthermore, while in this study the participants’ processing goals were set by the experimenters—evaluating a target, such an effect of fluency on the perceived relevance of information can be thought of as influencing any type of cognitive processing. Generally, it entails the heightening of the subjective relevance of fluently processed items above that experienced in normal or disfluent processing conditions.

Turning to the affective dynamics described by the theory of emotional intensity, their cognitive side might involve a mechanism of lowering the deterrents’ subjective relevance for the individual’s current interests and motivation. The present study was built upon the following reasoning: if, indeed, pre-existing affective states have such an effect, then any intervention that would increase this subjective relevance might alter the affective intensity pattern described by the theory of emotional intensity. As stated above, previous results suggest that fluency heightens the subjective relevance of the stimuli for the current processing purposes. When processing elements that are incompatible with the previously induced

emotion, enhanced fluency might increase their subjective relevance and, consequently, the amount of cognitive resources invested in them. This attentional enhancement effect, in turn, could increase the impact of these high fluency deterrents on the current affective state. Thus, we expected that deterrents processed with an elevated fluency would generate a different pattern of emotional intensity among the various conditions of deterrence magnitude than the one produced by normal fluency deterrents. Also, the replacement of the former emotion with the one induced by deterrents processed with enhanced fluency—a phenomena usually entailing the highest level of deterrence, as studies (Brehm, 1999) have shown—would appear even when participants are exposed to deterrents of lower magnitude.

Overview of the present study

In order to test these predictions, we conducted an experiment employing the research plan used in the studies testing the theory of emotional intensity, but with a supplementary independent variable. First, an affective state—good mood—was instigated. Most investigations testing the theory focused on actual emotions (anger, sadness, happiness); nevertheless, Brehm (1999) argued that since the core aspect under scrutiny is the intensity of affective states, “no distinctions appear to be necessary” (Brehm, 1999, p. 8) among emotion, affect and mood. The main reason for this equivalence is that all feeling states share the same function of controlling the behaviour, and in order to achieve this purpose they modulate their intensity as reaction to the other events that occur after their instigation. This is the feature which the theory is focused on; thus, beyond the specificities of mood when compared to the other affective states, this common dimension of intensity raises the possibility that mood fluctuations when confronting deterrents of various magnitudes respect the same pattern as that observed in the case of emotions. Furthermore, previous studies (Miron et al., 2007) tested the theory on other feeling states distinct from emotions (basic positive and negative affect),

showing that they also behave in a motivational manner, modulating their intensity as a cubic function of the interference factors.

Second, participants were exposed to no further treatment, or to low, moderate or strong deterrents, namely potential instigators of another affective state—pity. In terms of the theory of emotional intensity, such instigators are expected to function as deterrents because they call for a distinct affective state from the one previously instigated. Hence, pity is not conceived here as opposed to good mood, but merely as incompatible with it, especially from the standpoint of their subjective valence, as pity is qualitatively closer to the negative hedonic end. This difference in subjective quality leads to incompatibility, to mutual exclusiveness, since they cannot be experienced simultaneously (Brehm & Miron, 2006).

The supplementary independent variable was the processing fluency of these deterrents, half of the participants being exposed to deterrents processed with enhanced fluency, while the others perceived deterrents with normal, unaltered fluency. In this last group we expected that the intensity of good mood would be the same cubic function of the deterrent conditions as in the previous studies on the topic (Brehm, 1999), showing a decrease from the no deterrence condition to the low deterrence, an increase from low to moderate and another decrease from moderate to the strong deterrent condition. However, in the high perceptual fluency conditions, we expected that this pattern would drastically change, indicating a stronger impact of the deterrents processed with enhanced fluency, leading to the dissipation of the initial affective state (its sharp decrease in intensity) even when their magnitude was low. Thus, we predicted that the affective state would drop to a low level from the no deterrence to the weak deterrence conditions, without any further significant change across the other two conditions—of moderate and strong deterrents, respectively.

In line with other investigations on the topic (Brehm et al., 2009), we also investigated participants' evaluation of deterrents, expecting them to be related to the current affective state, thus

revealing a direct effect of emotional experience on their appraisal.

METHOD

The study was an incomplete between subjects design, with deterrence (none—“instigation only” condition/low/moderate/strong) and fluency (normal/enhanced) as the independent variables. Participants in the “instigation only” condition functioned as a control measure both for the groups with normal processing fluency of deterrents and for those with enhanced fluency. We examined the main and interaction effects of deterrence and fluency on affective state and perceptions of deterrents.

Participants

One hundred sixty-seven psychology undergraduates participated in this study (105 females and 62 males); they received course credit for their participation. The gender distribution across experimental conditions was balanced.

Materials

Instigation of positive mood. Positive mood was elicited using classical music; participants listened to a five-minute recording of the first movement (Allegro) of “Eine Kleine Nachtmusik” by Mozart; this musical material has been previously validated as a positive mood inductor (Harkness, Jacobson, Duong, & Sabbagh, 2010). In order to increase the affect-infusion of the music, they were also required to sketch on a piece of paper whatever the music inspired them to draw.

Manipulation of deterrence. We intended to deter positive mood using an opposite affective state, namely pity, which was instigated using photographs of old Caucasian males. There was a single protagonist facing the camera in each photo. The details that we expected to induce pity in our young participants were not only the age of the protagonists, but also their sad facial expressions, their bent posture and rounded

shoulders, emanating—with various intensities—a sense of loneliness and sorrow. The pictures were edited so that their protagonists—depicted from the waist up—would occupy approximately the same proportion in each of them (around 70%), thus being at the same distance from the camera across them. Also, the backgrounds in each photograph were blurred.

Photographs were selected in a pilot study, in which participants ($N=31$) were exposed to 25 such photographs and provided, for each, an assessment of its protagonist on three characteristics related to the emotion of pity: sad, pitiful and weak, on 11-point scales (from 0 = *Not at all* to 10 = *Extremely*). The mean score on these three criteria was used as an operationalisation of pity-induction potential of each photograph. On its basis, we divided the photographs into three groups: weak pity-induction potential (including the photographs with a mean score around 2), moderate potential (mean score around 5) and strong (mean score around 8). Then, the three photographs with the lowest standard deviation from each group were selected in order to be used in the experiment. The emotion-instigation effects of these three sets were tested in the second phase of the pilot study, in which participants ($N=63$) were divided in three groups. Each group was exposed for 4 s to each photograph in one of the sets, presented sequentially, then rated on 11-point scales the intensity of their current good and bad mood, anger, fear, frustration, tension, pep, disgust, surprise, and pity. In each group, the mean scores of the intensity of pity were close to the ones in the first phase of the pilot study (presented above). Also, bad mood showed the same pattern of intensity increase from the null pity-induction potential set to the strong potential set.

Manipulation of fluency. Before each target picture, participants in the enhanced fluency conditions were exposed to a prime consisting of a degraded visual contour of the protagonist of the photograph, a perceptual fluency-enhancing technique used in previous studies (e.g., Reber et al., 1998).

Dependent measures

Affect. Emotional intensity was measured by asking participants to indicate the extent to which they currently felt anger, bad mood, fear, good mood, frustration, tension, pep, disgust, surprise, and pity, on 11-point scales (from 0 = *Not at all* to 10 = *Extremely*).

Perception of the deterrents. Participants in the deterrence conditions were asked to give their impression of the people in the three photographs which they had previously seen, by rating them on the same set of personal characteristics as the one employed in the pilot study: sad, pitiful and weak. We employed this global measure, administered after participants filled in the affect scales—instead of one concerning each of the three photographs, administered immediately after viewing each, before filling in the affect scales—in order to avoid the contamination which might have been induced in this case by the semantic content of these personal traits (for instance, “sad”), which, in turn, might have influenced the affective measures.

Procedure

Participants were run in blocks of six, and they were randomly assigned to one of the experimental conditions. Upon arrival, participants in the deterrence conditions were told that they would participate in two separate studies, the first on the effects of music on spatial representations, which was, in fact, the mood-induction phase, and the second on impression formation, while those in the “instigation only” condition were only told about the first study. All were then required to listen to the musical material and to use a piece of paper placed in front of them to sketch whatever they feel inspired to draw. At the end of the musical material, these papers were collected, and the participants were placed at the six computers in the room. Participants in the “instigation only” condition received and filled out the affect questionnaire.

For the participants in the deterrence conditions, the experiment continued with the second task—deterrence manipulation—employing a computer-controlled procedure, using Inquisit 3.0 software. The on-screen instructions at the beginning explained to them that this next part of the study concerned the way people form their impressions about others, and that they would see a series of photographs. Participants in each of the three conditions of deterrence were exposed to the correspondent set of photographs, as defined by their pity-induction potential (weak potential—“low deterrence” condition, moderate and strong). The photos were approximately 20 × 20 cm in size, shown on 17-inch monitors, and each was presented for 4 s. Immediately before each photo, participants in the enhanced fluency conditions were also exposed to its contour prime, presented for 25 ms. There was a 4 s pause between the three photos. At the end, the on-screen instructions required them to open the two envelopes placed next to the computer in order (the envelopes were labelled 1 and 2) and fill out the questionnaires inside. The first enveloped contained the affect measures, and the second contained the perception of the deterrents measure. Once all the participants in the block finished, they were collectively debriefed and thanked for their participation.

RESULTS

Good mood

A significant interaction effect between deterrence and fluency was found: $F(2, 160) = 40.40, p < .01$. The interaction was explored first by polynomial contrasts using a pooled error term in each of the two conditions defined by fluency (normal and enhanced), in order to determine if the intensity of good mood in the four groups of deterrence followed the cubic effect predicted by the emotional intensity theory. This statistical analysis allows the testing of the two shifts in the curvature of emotional intensity among the four groups, created by its increase from low to moderate

deterrence, respectively the decrease from moderate to high deterrence.

In the normal fluency condition, the one-way analysis of variance (ANOVA) revealed a significant cubic effect, $F(1, 95) = 46.01$, $p < .01$, all differences in good mood being in the predicted direction and significant. The contrasts indicated that good mood decreased from the “instigation only” condition ($M = 5.96$; $SD = 1.34$) to the low deterrence ($M = 3.64$; $SD = 0.81$), $t(95) = 8.58$, $p < .01$, increased from the low to the moderate ($M = 4.41$; $SD = 0.88$), $t(95) = 2.84$, $p < .01$, and decreased from moderate to high deterrence ($M = 2.44$; $SD = 0.96$), $t(95) = 7.24$, $p < .01$.

In the enhanced fluency condition, the one-way ANOVA also revealed a significant cubic effect, $F(1, 89) = 27.50$, $p < .01$, but the trend of differences was different from the one in the normal fluency condition. Here, the decrease of good mood from the “instigation only” condition ($M = 5.96$; $SD = 1.34$) to the low deterrence ($M = 5.38$; $SD = 1.01$) was not significant, $t(89) = 1.72$, $p = .08$; instead, there was a significant decrease from low to moderate deterrence ($M = 2.33$; $SD = 1.44$), $t(89) = 9.15$, $p < .01$, while the increase from moderate to high deterrence was not significant ($M = 2.41$; $SD = 1.00$), $t(89) = 0.21$, $p = .83$.

These different trends of good mood in the two fluency conditions are presented in Figure 1. The comparisons between the normal and enhanced fluency groups in the three conditions of deterrence revealed significant differences in the first two of these conditions, $t(47) = 6.63$, $p < .01$, in the low deterrence group, and $t(49) = 6.13$, $p < .01$, in the moderate deterrence group, while the difference in the high deterrence condition was not significant, $t(40) = 0.09$, $p = .92$.

Deterrence induced affect: Pity

In line with the theory of emotional intensity and with previous results (Brehm & Miron, 2006) indicating that opposing affects do not occur at the same time, we expected the affective state instigated by deterrents to increase only when the pre-existing state diminished. In the groups of

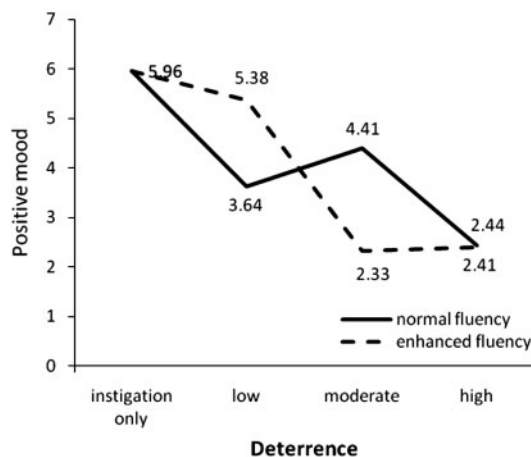


Figure 1. The effect of deterrence on good mood in the two fluency conditions.

participants exposed to deterrence, a significant interaction effect between deterrence and fluency was found: $F(2, 136) = 12.17$, $p < .01$. In the normal fluency condition, the one-way ANOVA revealed the quadratic effect predicted by the theory of emotional intensity to be significant: $F(1, 71) = 15.25$, $p < .01$. This effect indicates a significant curving pattern among the three deterrence conditions, created by a sharp increase in affective intensity from the second to the last group of magnitude. Indeed, the polynomial contrasts indicated that the intensity increase of pity from low deterrence ($M = 1.80$; $SD = 1.08$) to moderate ($M = 2.17$; $SD = 1.20$) was not significant, $t(71) = 1.22$, $p = .22$, but the increase from moderate to high deterrence ($M = 4.56$; $SD = 0.82$) was significant, $t(71) = 8.01$, $p < .01$. In the enhanced fluency condition the quadratic effect was also significant, $F(1, 65) = 9.24$, $p < .01$, but in a different trend, showing significant increases both from low ($M = 2.41$; $SD = 0.78$) to moderate deterrence ($M = 4.48$; $SD = 0.94$), $t(65) = 8.14$, $p < .01$, and from moderate to high deterrence ($M = 5.18$; $SD = 1.01$), $t(65) = 2.48$, $p = .016$.

The comparisons between the normal and enhanced fluency groups in the three conditions of deterrence revealed significant differences in all three conditions, $t(47) = 2.28$, $p = .027$, in the low

deterrence group, $t(49) = 7.71$, $p < .01$, in the moderate deterrence group, and $t(40) = 2.17$, $p = .036$, in the high deterrence condition.¹

Perceptions of the deterrents

We present the analysis on the mean score of the three items concerning the impression of the protagonists depicted in the three photos, since all individual items show the same variations. On this composite measure, the interaction effect between deterrence and fluency was significant, $F(2, 136) = 7.75$, $p < .01$. The quadratic effect was significant in the normal fluency condition, $F(1, 71) = 31.11$, $p < .01$; there was no significant variation of impression from the low deterrence set ($M = 3.52$; $SD = 1.23$) to the moderate deterrence set ($M = 4.00$; $SD = 0.89$), $t(71) = 1.23$, $p = .22$, while protagonists of the high deterrence set were rated significantly higher ($M = 8.24$; $SD = 1.78$) on the three personal traits (weaker, more sad and pitiful) than those in the moderate set, $t(71) = 10.93$, $p < .01$. In the enhanced fluency condition only a linear effect was significant, $F(1, 65) = 285.73$, $p < .01$; ratings on the three traits of the people depicted in the moderate set ($M = 5.96$; $SD = 0.90$) were significantly higher than of those in the low deterrence set ($M = 3.54$; $SD = 1.21$), $t(65) = 7.92$, $p < .01$; also, the increase in rating from moderate to high deterrence ($M = 9.41$; $SD = 1.76$) was significant, $t(65) = 10.32$, $p < .01$. While the difference between participants exposed to the pictures in the low deterrence set with normal and enhanced fluency was not significant, $t(47) = 0.06$, $p = .95$, those exposed to the other two sets in enhanced fluency conditions gave higher ratings than normal-fluency participants, $t(49) = 7.84$, $p < .01$, in the moderate deterrence condition, and $t(40) = 2.37$, $p = .023$, in the high deterrence condition.

DISCUSSION

Although numerous studies on the interplay between affective and metacognitive experiences have been carried out, the effects of processing fluency on pre-existing emotions have received less attention. Our study investigated the role that fluency plays in the emotional intensity modulations as reactions to deterrents, and its results show that this pattern is drastically altered when deterrents are perceived with enhanced fluency. In normal processing conditions, the cubic effect of deterrence magnitude as predicted by emotional intensity theory (Brehm, 1999) was replicated, employing as deterrents potential instigators of an opposed emotion with pre-tested magnitude. In the enhanced fluency conditions, the intensity of the pre-existing affective state did not show the same significant decrease from the "instigation only" condition to the low deterrence; this result can be interpreted as indicating the stronger magnitude of the deterrent, induced by enhanced fluency, which, in the emotional intensity theory account, required a higher intensity of the pre-existing emotion in order to resist it. This interpretation of deterrence impact being strengthened by enhanced fluency is sustained by the other results concerning the intensity of the initial state, namely its significant decrease when exposed to moderate deterrents (thus, from a lower level of magnitude compared to the normal fluency condition), as well as the differences between normal and enhanced-fluency groups across the three conditions in which participants were exposed to deterrents. Although significant, the impact of enhanced fluency proved to be lower than expected, since the definitive decrease or dissipation of good mood only occurred when participants were exposed to deterrents of moderate magnitude, while the low magnitude ones proved to be too weak to instigate such a decrease.

¹Bad mood also showed some significant variations. In both fluency conditions, the difference between low and moderate deterrence was not significant, but the increase from moderate to high deterrence was significant, $t(71) = 6.11$, $p < .01$ in the normal fluency condition and $t(65) = 3.96$, $p < .01$ in the enhanced fluency condition. As in the case of pity, the differences between the normal and enhanced fluency groups were all significant, with bad mood being more intense in the groups which processed the deterrents with enhanced fluency.

This differential effect suggests that fluency can heighten the emotional impact of deterrents, but it cannot “magically” make them all—irrespective of their magnitude—influential enough to detour the individual’s cognitive processing and, consequently, to dissipate his or her pre-existent affective state.

The results concerning the affective state playing the part of deterrence—pity—show that its intensity is heightened by enhanced-fluency deterrents, supporting the idea of their heightened emotional impact as effect of the fluency manipulation. Also, the results support one of the ideas derived from the theory (Brehm & Miron, 2006), that opposing emotions can not occur simultaneously, since the intensity pattern of this deterrence-induction affect was inversely related to the one of the pre-existing state, suggesting that as the impact of the deterrence—induced by its magnitude and fluency—increased, pity tended to replace good mood. A more or less parallel pattern emerged for the perceptions of the deterrents, suggesting a direct effect of the current affective state on these subjective evaluations, but also a significant influence of the fluency with which deterrents were perceived.

Our interpretation of these fluency effects is built upon its consequences in terms of subjective experience on the perceived fit of new information to the current individual’s interests. We assume that high processing fluency of deterrents increases this subjective relevance, generating a more substantial influence on the current affective state through an attentional enhancement effect which, in turn, heightens the impact of the emotion that they instigate. One of the limits of the study is that it doesn’t provide a direct assessment of this effect; future research could extend the in-depth analysis of these interactions between affect and fluency on the consequent emotional state. Previous findings in the evaluative area (Sansom-Daly & Forgas, 2010) support the existence of such combined effects, showing that disfluency is associated with accentuated affective priming effects. Moreover, future investigations could also test the direct causal relationships between the two, such as the presumed

general cognitive mechanism hypothesised here as responsible for the resistance of affective states to deterrents. Specifically, future research could assess whether their intensity modulations involve the diminishing of the fluency that the various deterrents are processed with and, generally, explore the cognitive underpinnings of the phenomena described by the theory of emotional intensity.

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