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Asymmetric perception of gains vs non-losses and losses vs non-gains: The causal role of regulatory focus*

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Abstract

Recent studies show that, while losses loom larger than equivalent non-gains, gains loom larger than equivalent non-losses. This finding, at odds with the loss aversion principle, has been interpreted within the framework of regulatory focus theory. In this study, we explore the causal effect of regulatory focus on the asymmetric perception of gains vs non-losses and losses vs non-gains. We examine the perceived effects of both hypothetical and actual changes in monetary wealth, while orthogonally manipulating framing, valence, and regulatory focus. We find a significant interaction between the three factors. The gain vs non-loss asymmetry in perceived satisfaction is stronger in promotion focus, while the loss vs non-gain asymmetry in perceived dissatisfaction is stronger in prevention focus. The results suggest that the effects of incentives framed in terms of (non)gains and (non)losses, depend on their congruence with the individual's motivational state.

Keywords: Loss-gain asymmetry, regulatory focus, prospect theory, subjective value
JEL classification: C91; D81

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1. Introduction

In their prospect theory, Kahneman and Tversky (1979) proposed a value function to represent the subjective perception of changes in wealth. The value function is assumed to be concave above the reference point and convex below it, so that the marginal value of both gains and losses decreases with their magnitude. A second salient characteristic of the value function is that, departing from the reference point, it is steeper for losses than for gains. The asymmetric shape of the value function accounts for the loss aversion principle (LA), which states that losses loom larger than gains. According to LA, the subjective disutility associated to an outcome coded as a loss should be larger than the subjective disutility associated to the same outcome when coded as a non-gain. Consistently with this prediction, Kahneman, Knetsch, and Thaler (1986) found that, in violation of the normative model, a price increase (loss) is judged as more unfair than a cancellation of a former price reduction (non-gain), despite the two changes in wealth being identical.

As pointed out by Liberman, Idson, and Higgins (2005), the same principle of LA could be applied to positive outcomes. Following Kahneman et al.'s reasoning, a non-loss should be perceived more strongly than an equivalent gain. Therefore, for example, a decision-maker experiencing the cancellation of a former price increase (non-loss) should perceive higher subjective utility than when experiencing a corresponding price reduction (gain). Liberman et al. (2005) tested this prediction in three studies, where they manipulated the valence (positive vs. negative) and the framing (gain vs. loss) of the outcome. The results for the negative outcome conditions replicated the finding that losses are perceived more strongly than non-gains. However, in the positive outcome conditions, the results indicated that gains are perceived more strongly than non-losses, contrary to the LA predictions. These results, in line with previous findings on emotional reaction (Idson, Liberman, and Higgins, 2000), have been interpreted using the framework of regulatory focus theory (Higgins, 1997, 2000).

Regulatory focus theory starts from the functionalist assumption that nurturance and security are two fundamental needs for the human being. It proposes the existence of two distinct regulatory systems concerning either nurturance or security: promotion and prevention. Promotion and prevention states differ with respect to both strategic inclination and goals. The promotion focus is related to hopes, aspirations and nurturance needs, and involves sensitivity to positive outcome and inclination to approach. On the other hand, the prevention focus is related to duties and security needs, and involves sensitivity to negative outcome and inclination to avoidance. Generally, people differ in their chronic regulatory focus, thus being individually more prone to either promotion or prevention states (Higgins and Silberman, 1998). However, the regulatory focus system may also be activated by the context or by specific tasks and stimuli.

The regulatory focus activation can explain the asymmetry in the perception of gains vs non-losses and losses vs non-gains (Liberman et al., 2005; Idson et al., 2000; Idson et al., 2004). More specifically, the rationale proposed by these authors is that a loss framing (loss and non-loss conditions) activates a prevention focus,

whereas a gain framing (gain and non-gain conditions) activates a promotion focus. This implies that negative outcomes are perceived more strongly in a loss framing and positive outcomes are perceived more strongly in a gain framing. As argued by Idson et al. (2000; p. 254), in dealing with a positive outcome, the pleasure of promotion success (gain) should be more intense than that of prevention success (non-loss); vice versa, in facing a negative outcome, the pain of prevention failure (loss) should be more intense than that of promotion failure (non-gain). Thus, the effect of framing on regulatory focus could explain why losses loom larger than non-gains and gains loom larger than non-losses.

The regulatory focus hypothesis leads to an intriguing interpretation of the evidence presented in Liberman et al. (2005). However, alongside this motivational perspective there is also a purely cognitive explanation of the results, based on the "feature-positive" effect (Jenkins and Sainsbury, 1970). The feature-positive effect suggests that people have more difficulty in processing information that is absent than information that is present. This bias has been described in similar forms in a variety of subjects, ages, experimental settings and cognitive processes, such as visual search (e.g., Hearst, 1991), probability learning (Estes, Allmeyer, and Reder, 1967), evaluative judgment (Einhorn and Hogarth, 1978), recognition (Agostinelli, Sherman, Fazio, and Hearst, 1986), and hypothesis development (Klayman, 1995). Under the assumption that non-loss and non-gain can be interpreted as an absent feature, while loss and gain as a present feature, the tendency to underweight the absent feature could provide an explanation of the evidence.

In previous studies (Liberman et al., 2005; Idson et al., 2000; Shah, Higgins, Friedman, 1998) regulatory focus was not manipulated independently of outcome valence (positive vs. negative) and framing (loss vs. gain). Therefore, its role cannot be disentangled from that of other factors, such as the presence/absence asymmetry. On the other hand, the regulatory focus has been effectively manipulated in some studies on the gain and loss asymmetry. For instance, Halamish, Liberman, Higgins and Idson (2008) manipulated regulatory focus to assess the effects on discounting over uncertainty for gains and losses. Similarly to the present research, Zhao and Pechmann (2007) manipulated the individual's regulatory focus to investigate the impact of persuasive campaigns when the individual's motivational state, the message's regulatory focus and the message frame act synergically.

The interpretation proposed by Liberman et al. (2005) is based on the assumed relationship between framing and regulatory focus (Crowe and Higgins, 1997; Higgins, Roney, Crowe, and Hymes, 1994; Higgins and Tykocinski, 1992). Accordingly, framing an outcome in terms of gain or non-gain should lead to a promotion focus activation, whereas framing it in terms of loss or non-loss should imply a prevention focus activation (Shah et al., 1998). Nevertheless, from a theoretical standpoint, the motivational system could be conceived as independent of both frame and outcome valence. A focus of promotion or prevention may be induced by previous experiences independently of the context-specific stimuli, or it could be an individual chronic state (Higgins and Silberman, 1998). Moreover, there might be situations in which it is the negative outcome to induce approach behavior. Studies of decision making provide evidence of a "break even" effect (Thaler and Johnson,

1990), whereby risk taking is facilitated by previous loss. Consistently, recent neuroscientific evidence shows that decision-makers tend to choose riskier options when primed with loss trials than with gain trials (Gehring and Willoughby, 2002).

The present study aims at identifying the causal impact of regulatory focus on the asymmetric perception of gains vs non-losses and losses vs non-gains. To this purpose, we investigate experimentally the perceived effects of changes in monetary wealth, while orthogonally manipulating three factors: framing (gain/loss), valence (positive/negative), and regulatory focus (promotion/prevention). This enables us to directly test the moderation effect of regulatory focus on the interaction between framing and outcome valence. More specifically, we hypothesize:

1. Regulatory focus, framing and valence act synergically.
2. For positive outcomes, the asymmetry in perceived satisfaction between a gain and an equivalent non-loss is stronger in promotion than in prevention focus.
3. For negative outcomes, the asymmetry in perceived dissatisfaction between a loss and an equivalent non-gain is stronger in prevention than in promotion focus.

We test for the predicted three-way interaction effect in two experimental studies based on a 2 (regulatory focus: promotion vs. prevention) X 2 (outcome valence: positive vs. negative) X 2 (framing: gain vs. loss) between-subjects randomly assigned factorial design. In the first, we examine the perceived effects of the outcomes a hypothetical (non)gain-(non)loss scenario. In the second, we examine the perceived effects of the actual (non)gain-(non)loss monetary outcome of a gambling task. Therefore, the present study examines not only the anticipated (un)pleasantness and emotional reactions to hypothetical outcomes, but also the perceived effects of actual monetary outcomes.[1] The paper is structured as follows. Section 2 describes the first experimental study, based on a fictitious scenario. Section 3 presents the second study, where participants experience actual monetary outcomes. Section 4 provides a discussion of the findings and concludes.

2. Study 1

2.1 Method

2.1.1. Participants

The sample consisted of 200 undergraduate students (81% females) from different backgrounds at the University of Milan-Bicocca, who volunteered to

[1] The comparison between virtual and actual outcomes is important, as recent research has highlighted that loss aversion occurs more reliably for anticipated outcomes than for experienced ones (Gilbert, Morewedge, Risen, and Wilson, 2004; Kermer, Driver-Linn, Wilson, and Gilbert, 2006; see also Harinck, VanDijk, Van Beest, and Mersmann, 2010).

participate without any monetary reward. Age was between 19 and 41 years (M = 22.18; SD = 3.54)

2.1.2. Materials and procedures

Participants were approached in various libraries at the University of Milan-Bicocca. They were asked to participate in a role-play study and those who accepted were given a paper-and-pencil questionnaire to fill out. On the cover page, participants' personal data were collected. In the first part of the booklet, the scenario was presented: the participant was asked to imagine a situation in which she decided to go to a gambling house with some friends. The regulatory focus of participants was manipulated through the description of the scenario: half of the sample was induced to think that the money in play had been saved for buying school textbooks (prevention condition); the other half of the sample was told that possible gambling gains could be used to buy something they really desired (promotion condition).

After presenting the scenario, the first game was proposed. An urn contains 100 marbles: 50 white, 30 black and 20 gray marbles. One marble is to be drawn randomly from the urn. The participant can bet €25 on one color according to the following rules: if she bets on white and wins, she receives €50; if she bets on black and wins, she receives €100; if she bets on gray and wins, she receives €162.50; if she does not bet on the right color, she receives €0. Participants were then asked whether they would be willing to bet and, if so, on which color. Since the different choices implied different risk propensity, we used this choice as a manipulation check, in order to assess the effect of the regulatory focus manipulation.

In the following section of the questionnaire, a second hypothetical situation was presented in four different versions according to the experimental condition. In gain condition, participants were virtually endowed with €80 and were told they had gained €20 at the roulette, thus obtaining €100. In non-gain condition, participants were virtually endowed with €80 and were told they had gained €20 at the roulette, but the bet had been invalidated for a formal reason, so that they obtained €80. In loss condition, participants were virtually endowed with €100 and were told they had lost €20 at the roulette, thus obtaining €80. In non-loss condition, participants were virtually endowed with €100 and were said they had lost €20 at the roulette, but the bet had been invalidated for a formal reason, so that they finally obtained €100.

Hence, the experiment consisted of a 2 (regulatory focus: promotion vs. prevention) X 2 (outcome valence: positive vs. negative) X 2 (framing: gain vs. loss) between-subjects design. Participants were randomly assigned to one of the eight experimental groups. Finally, participants were asked to evaluate how they would feel about the outcome on a scale ranging from 1 (*very bad*) to 7 (*very good*). At the end of the questionnaire, participants were properly debriefed, thanked and released.

2.2 Results

2.2.1. Manipulation check

In order to assess the effectiveness of the regulatory focus manipulation, we analyzed the gambling intentions in the first game. To this aim, we assumed the four

options to be along a continuum of risk propensity and we assigned a score accordingly: 0 to the choice of not betting; 1 to the choice of betting on white; 2 to the choice of betting on black; 3 to the choice of betting on gray. A Mann-Whitney non-parametric test indicated that, consistently with our purpose, participants in prevention condition were more risk averse (M =2.05, SD = 0.99) than participants in promotion condition (M =2.44, SD = 0.94), z = -2.94, p = .004.

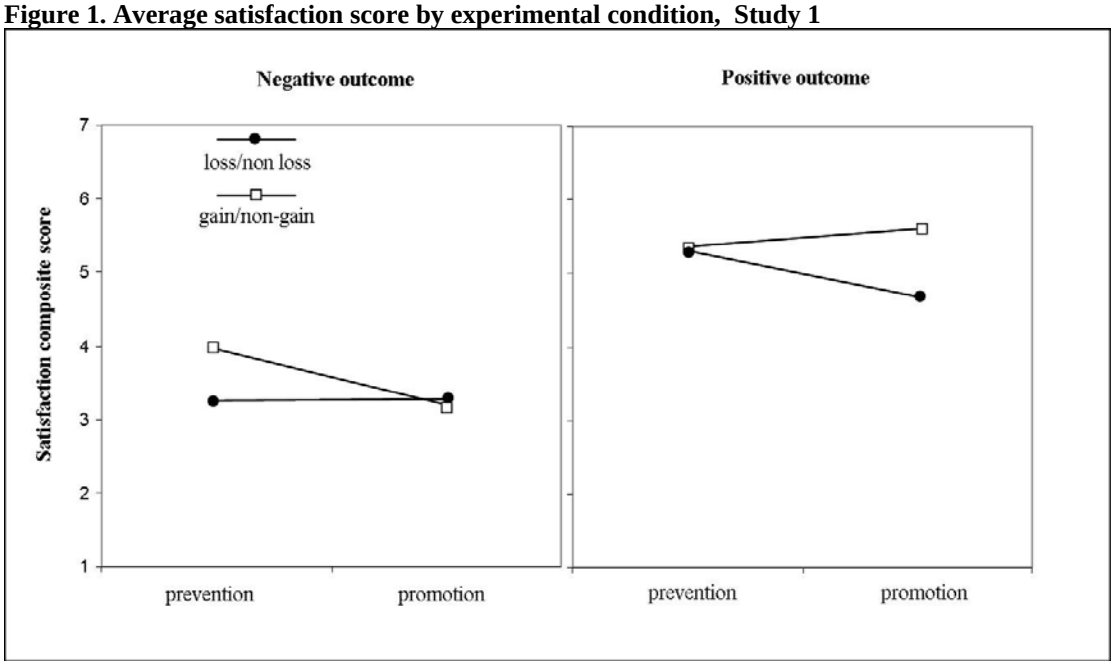
2.2.2. Satisfaction

Having verified the effects of our focus manipulation, we tested the hypotheses about the moderator role of the regulatory focus on the relation between outcome valence and framing in affecting the individual's perception of gains and losses. The satisfaction item was submitted to a 2 (Regulatory focus: promotion vs. prevention) × 2 (Outcome: positive vs. negative) × 2 (Framing: gain vs. loss) analysis of variance (ANOVA), with all the factors varying between participants. The statistical analysis revealed an expected main effect of valence, $F(1, 192) = 125.76$, $p < .001$, $\eta_p^2 = .39$: participants who obtained a positive outcome were more satisfied (M =5.24, SD = 1.10) than those who received a negative outcome (M =3.42, SD = 1.23). In line with Liberman et al. (2005), we also found a main effect of framing, $F(1, 192) = 6.06$, $p = .01$, $\eta_p^2 = .03$: when the outcome was framed in terms of gain, the experience was perceived as more positive (M =4.57, SD = 1.43) than when the outcome was framed in terms of loss (M =4.06, SD = 1.49).

Figure 1 displays average satisfaction scores by experimental condition. As illustrated, the effects of regulatory focus are consistent with the hypothesis. The ANOVA yielded a three-way interaction between regulatory focus, outcome and framing, $F(1, 192) = 6.36$, $p = .01$, $\eta_p^2 = .03$. In positive valence condition, the results of the 2 (Regulatory focus: promotion vs. prevention) × 2 (Framing: gain vs. loss) ANOVA showed a two-way interaction between focus and framing, $F(1, 95) = 3.91$, $p = .05$, $\eta_p^2 = .04$. When the outcome was positive and participants were in promotion focus, gain tended to loom larger (M = 5.61, SD = 0.83) than non-loss (M = 4.69, SD = 1.44), $t(52) = 2.84$, $p = .007$, $d = .78$. But when participants were in prevention condition, gain (M = 5.36, SD = 0.91) and non-loss (M = 5.30, SD = 0.98) had comparable effects on the level of satisfaction, $t(43) = 0.21$, $p = .83$, $d = .06$. In negative valence condition, the 2 (Regulatory focus: promotion vs. prevention) × 2 (Framing: gain vs. loss) ANOVA did not yield a significant interaction effect, $F(1, 97) = 2.63$, $p = .10$, $\eta_p^2 = .03$. However, the pattern of results was specular to that in positive valence condition. In particular, when the outcome was negative and participants were in prevention focus, loss led to lower satisfaction (M = 3.26, SD = 1.23) than non-gain (M = 3.96, SD = 1.37), $t(49) = 1.92$, $p = .06$, $d = .54$. In promotion condition, loss (M = 3.28, SD = 1.21) and non-gain (M = 3.20, SD = 1.00) had similar effects on satisfaction ($t(48) = 0.25$, $p = .80$, $d = .07$).

Analyses did not reveal any other significant effect, Fs (1, 92) < 2.87, ps > .09.

Figure 1. Average satisfaction score by experimental condition, Study 1



Note: Individual satisfaction with a positive or a negative fictitious outcome, framed in terms of loss or gain, as a function of regulatory focus (promotion vs. prevention).

3. Study 2

3.1 Method

3.1.1. Participants

One hundred sixty-two students (46.3% females) from different backgrounds at the University of Milan Bicocca participated in the study for monetary rewards, with age ranging between 18 and 31 (M = 22.64; SD = 1.96). Participants were recruited by e-mail, using a list of voluntary potential candidates, with an invitation to participate in an experiment on economic behavior with actual monetary incentives. They earned 5 or 15 euro, depending on the outcome of the experimental task.

3.1.2. Materials and procedures

We implemented eight sessions lasting around 30 min each. The sessions were conducted in the Experimental Economics Laboratory of the University of Milan Bicocca. The experiment was run using the experimental software z-Tree (Fischbacher, 2007). Upon arrival, participants were informed that the experiment would be composed of three different parts: a questionnaire, the experimental task, and another questionnaire.

The first part consisted of the manipulation of the regulatory focus and manipulation check. Participants were asked to write a short essay, within a 10 min time span, on a topic that varied according to the experimental condition: in the promotion condition they were asked to describe their current hopes and aspirations for the future; in the prevention condition they were asked to describe their current

duties, obligations and fears for the future (see e.g., Halamish et al., 2008, for an analogous procedure). Participants were randomly assigned to one of the two experimental conditions (promotion or prevention). After completing the essay, participants answered 16 question items drawn from the regulatory focus questionnaire (Lockwood, Jordan, and Kunda, 2002) translated into Italian. Designed to assess chronic prevention or promotion goals, the scale was used here as a manipulation check to evaluate the temporary regulatory focus after the experimental manipulation. Participants evaluated each item (e.g., "I am focused on preventing negative events in my life"; "I typically focus on the success I hope to achieve in the future") on a 7-point scale ranging from 1 (*absolutely no)* to 7 (*absolutely yes*). The complete list of items is reported in the Appendix.

At the end of the questionnaire, the second part started. The task consisted of guessing the outcome of a coin toss (heads or tails). Participants were instructed that they would be paid on the basis of their guess of the outcome of the coin toss. The scenario was manipulated by framing (gain and loss). In the gain framing (gain and non-gain conditions), each participant received the following information:

> "You have an endowment of 5 euro. You can win 10 euro on the basis of a coin toss. You have to guess the outcome of the toss (heads or tails). We will then flip a coin.
>
> - If your guess is correct, you will win 10 euro; therefore, your total earnings will be 15 euro.
> - If your guess is not correct, you will not win 10 euro; therefore, your total earnings will be 5 euro."

In the loss framing (loss and non-loss conditions), each participant received the following information:

> "You have an endowment of 15 euro. You can lose 10 euro on the basis of a coin toss. You have to guess the outcome of the toss (heads or tails). We will then flip a coin.
>
> - If your guess is correct, you will not lose 10 euro; therefore, your total earnings will be 15 euro.
> - If your guess is not correct, you will lose 10 euro; therefore, your total earnings will be 5 euro."

In order to ensure public knowledge, instructions were distributed and read aloud. Control questions were distributed to ensure understanding of the experimental task and procedures. Answers were privately checked and, if necessary, individually explained to the participants, and the task did not start until all subjects had answered all questions correctly. Then, participants materially received their endowments in euro and made their choice. The coin was tossed, and the results were displayed on screen. Depending on the outcome of the guess, participants in the gain (non-gain) condition received (did not receive) €10 in addition to their initial endowment of €5; participants in the loss (non-loss) condition had to (did not have to) return €10 from their initial endowment of €15. Note that the final outcome is identical across framing

conditions in both positive and negative valence conditions (gain vs non-loss and loss vs non-gain). This rules out any effects of differences in the end state. Overall, the experimental design consisted of a 2 (regulatory focus: promotion vs. prevention) X 2 (framing: gain vs. loss) X 2 (outcome valence: positive vs. negative) between-subjects design.

Following the gambling task, the third part of the experiment was administered, consisting of an on-line questionnaire. Participants were first asked a number of questions asking to evaluate the experimental task. In particular, three questions focused on participants' satisfaction with the outcome of their choice: (1) "How satisfied are you with the outcome of your bet?"; (2) "How lucky do you feel?"; (3) "How did fate treat you?". Answers were given on a scale ranging from -9 (*very unsatisfied/not at all/very badly*) to +9 (*very satisfied/completely/very nicely*). 0 indicated the midpoint of the scale. Then, socio-demographical data were collected. Finally, participants were properly debriefed, thanked and released.

3.2 Results

3.2.1. Manipulation check

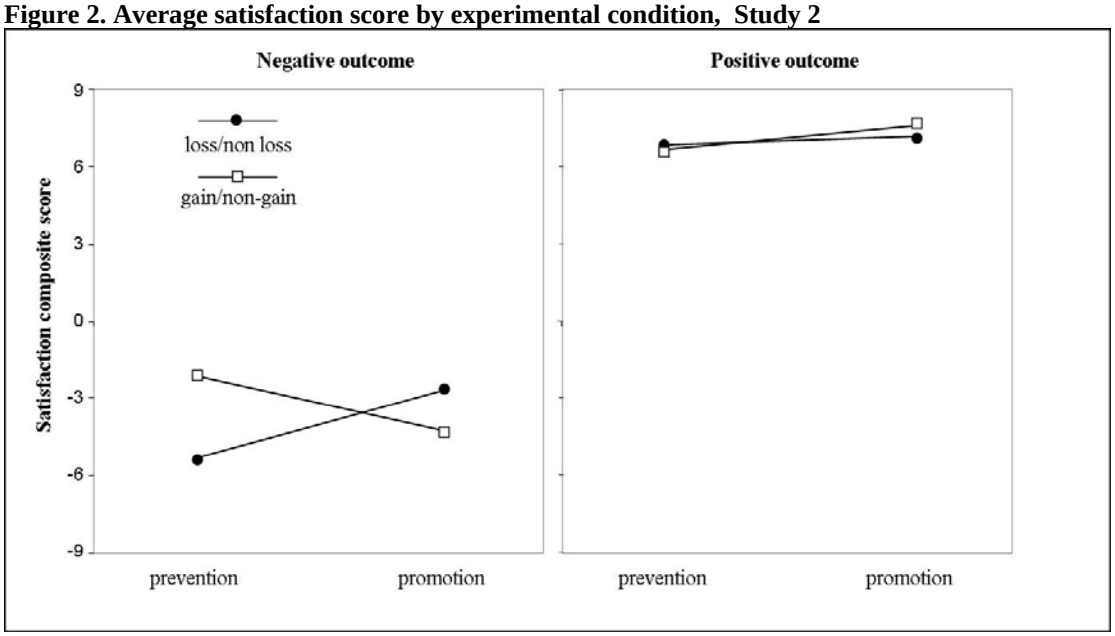
In order to assess the effects of the regulatory focus manipulation, we analyzed the results for the regulatory focus scale. After reversing the items of prevention and assessing the scale reliability (Cronbach's $\alpha = 0.60$), we computed a composite score. The *t*-test revealed that, consistently with our purpose, participants in prevention condition tended to be less focused on promotion (M =4.70, SD = 0.51) than participants in promotion condition (M =4.85, SD = 0.55), $t(160) = 1.87$, $p = .06$, $d = .28$.

3.2.2. Satisfaction

We computed a satisfaction composite score averaging the three relevant items of the questionnaire (Cronbach's $\alpha = 0.92$). The satisfaction index was submitted to a 2 (Regulatory focus: promotion vs. prevention) × 2 (Outcome: positive vs. negative) × 2 (Framing: gain vs. loss) analysis of variance (ANOVA), with all the factors varying between participants.

As illustrated in Figure 2, the analysis reveals the main effect of valence, $F(1, 154) = 433.22$, $p < .001$, $\eta_p^2 = .74$: participants who experience a positive outcome are more satisfied (M =7.08, SD = 2.39) than participants who experience a negative outcome (M =-3.63, SD = 4.04).

Figure 2. Average satisfaction score by experimental condition, Study 2



Note: Individual satisfaction with positive or negative actual monetary outcome, framed in terms of loss or gain, as a function of regulatory focus (promotion vs. prevention)

Consistently with the results of study 1, the ANOVA yields a three-way interaction between regulatory focus, outcome and framing, $F(1, 154) = 6.58$, $p = .01$, $\eta_p^2 = .04$. In negative valence condition, the results of the 2 (Regulatory focus: promotion vs. prevention) × 2 (Framing: gain vs. loss) ANOVA show neither a main effect of focus, $F(1, 75) = .08$, $p = .77$, nor of framing, $F(1, 75) = .71$, $p = .40$. The absence of main effects is signified by a two-way interaction between focus and framing, $F(1, 75) = 6.84$, $p = .01$, $\eta_p^2 = .08$. When confronted with a loss, in line with the hypotheses, participants in prevention condition (M =-5.25, SD = 3.08) tend to be less satisfied than participants in promotion condition (M =-2.67, SD = 5.24), $t(34) = 1.84$, $p = .07$, $d = .60$; vice versa, when confronted with a non-gain, participants in promotion condition (M =-4.24, SD = 3.28) tend to be less satisfied than participants in prevention condition (M =-2.17, SD = 4.09), $t(41) = 1.83$, $p = .07$, $d = .56$. As a consequence, when the outcome is negative and participants are in prevention focus, loss looms larger than non-gain, $t(39) = 2.71$, $p = .01$, $d = .85$. This difference is no longer significant when participants are in promotion condition, $t(36) = 1.14$, $p = .26$, $d = .36$.

In positive valence condition, the 2 (Regulatory focus: promotion vs. prevention) × 2 (Framing: gain vs. loss) ANOVA shows neither main effects nor an interaction effect, $Fs(1, 79) < 1.35$, $p > .25$. Participants' satisfaction when dealing with a gain in promotion (M = 7.63, SD = 1.79) and in prevention condition (M = 6.70, SD = 2.08) or when confronted with a non-loss in promotion (M = 7.18, SD = 2.53) and in prevention condition (M = 6.87, SD = 2.92) did not differ one from the other, $ps > .05$. Thus, the analysis reveals an asymmetry between the positive and the negative outcome conditions. The data also show a two-way interaction between focus and frame $F(1, 154) = 3.87$, $p = .05$, $\eta_p^2 = .02$. Given the asymmetry between

positive and negative valence conditions, this finding reflects the interaction between focus and framing in the negative outcome condition. Thus, the difference between loss and gain in prevention focus condition (M_{loss} =0.96, SD_{loss} = 6.80; M_{gain} = 2.15, SD_{gain} = 5.53), p = .04, becomes negligible in prevention focus condition (M_{loss} = 3.34, SD_{loss} = 6.15; M_{gain} = 0.93, SD_{gain} = 6.54), p = .44.

The three-way ANOVA did not reveal any other significant effect, Fs (1, 154) < 0.73, ps >.39.

4. Discussion

According to the LA principle (e.g., Kahneman, Knetsch, and Thaler, 1991), people should perceive greater disutility when facing a loss than a non-gain. Therefore, for example, we should experience more disutility when facing a price increase (loss) than when not obtaining an expected discount (non-gain). But what happens when we believe to have lost a bill and then find it in a pocket (non-loss) as opposed to when we find a bill in the street (gain)? Generally, and contrary to the LA principle, subjects experience more pleasure in the latter situation than in the former one. Recent research on the asymmetric perception of loss vs non-gain and gain vs non-loss (Idson et al., 2000; Liberman et al., 2005) has provided empirical support to this idea. In fact, although these studies confirmed the LA predictions when the outcome was negative (loss looms larger than non-gain), they revealed the opposite pattern when the outcome was positive (gain looms larger than non-loss). The authors interpreted the results within the framework of regulatory focus (Higgins, 1997, 1998). Since loss and non-loss information would be related to a prevention focus, whereas gain and non-gain information to a promotion focus, the motivational factor and the outcome information would work synergically thus strengthening loss over non-gain, on one hand, and gain over non-loss, on the other hand.

The present contribution aimed at further exploring this explanation, trying to disentangle the role of the regulatory focus from that of the other variables involved in the process, namely the framing and the outcome valence. The analysis of the possible moderating role of regulatory focus is relevant for at least two reasons: first, the asymmetry between gain vs. non-loss and loss vs. non-gain is compatible with other explanations based on cognitive aspects (e.g.“feature-positive” effect, Jenkins and Sainsbury, 1970); second, the activated regulatory focus could be independent from the framing and the valence of the contingent outcome.

Therefore, we conducted two studies where the regulatory focus of subjects, the valence of the outcome and the framing of the task were orthogonally manipulated. Moreover, while in Study 1 participants were presented with a hypothetical outcome and we investigated its impact on the anticipated effects, in Study 2 participants experienced actual monetary gains or losses. In line with the hypotheses, the results of the two studies revealed a significant interaction between frame, valence and regulatory focus. More explicitly, gains produced more satisfaction than equivalent non-losses in promotion than in prevention focus, while losses elicited more dissatisfaction than non-gains in prevention than in promotion focus. Overall, the pattern showed a difference between gain- and loss-framed outcomes only when there was a positive matching between regulatory focus, framing

and valence. More specifically, in Study 2, although the pattern is qualitatively consistent with the hypotheses, the results showed an asymmetry between the negative and the positive outcome, as the interaction was significant only in positive outcome conditions. This finding could be explained by a ceiling effect: when the outcome is positive, earning 15-euro leads participants to high levels of satisfaction independently of the focus and framing manipulation. Another related explanation is the role played by individuals' expectations about the outcome. Given that participants in Study 2 expect to earn a monetary payoff, the (unanticipated) negative outcome could be cognitively more salient than the (anticipated) positive outcome. To the extent that the positive outcome is viewed as the status quo, it is less likely to elicit psychological effects than the negative outcome.

From a theoretical point of view, the results suggest that regulatory focus is not always likely to engender a gain-nonloss asymmetry (Liberman et al., 2005): when the individual orientation does not fit with the stimuli, the effect of regulatory focus is even likely to nullify this asymmetry. The idea that the outcome worth can be enhanced by "fit" is in line with previous studies on regulatory focus (Higgins, 2002). For instance, Higgins (2002) proposed the outcome-value postulate according to which value would derive from a congruence between the outcome and the individual's motivational orientation. Thus, promotion-focused decision-makers would evaluate promotion-relevant outcomes as more important, whereas decision-makers in prevention state would evaluate prevention-relevant outcomes as more important. This implies that not only the same value can be weighed differently because of its frame (Kahneman, Knetsch, and Thaler, 1991), but that the same outcome can have different subjective value for different people, or for the same person in different situations, depending on their motivational state, goals, and regulatory orientation (Higgins, 2002). In addition, conceiving the regulatory focus as an exogenous variable allowed us to conceptually separate the role of the hedonic principle from some more cognitive factors, such as the feature-positive effect (Agostinelli, Sherman, Fazio, and Hearst, 1986; Jenkins and Sainsbury, 1970). Given the moderating role of regulatory focus, future studies could investigate more directly some other hypotheses on the factors (cognitive or motivational) leading to the gain-nonloss asymmetry.

The attention to the moderating role of regulatory focus on the relation between framing and valence and the motivational perspective on the process analysis (e.g., Halamish et al., 2008) could also have some interesting implications. One of the possible implications concerns incentives. As argued by Shah et al. (1998), incentives may adequately motivate behaviour depending on their congruence with individuals' needs and goals. Accordingly, the authors demonstrated that the regulatory focus moderates the relation between incentive and performance: thus, differently from prevention-focused individuals, promotion-focused individuals perform better when incentives are framed in terms of accomplishment (promotion congruent) as opposed to safety (prevention congruent). Similarly, previous studies showed people to be more willing to make efforts to approach gains than non-losses or to avoid losses than non-gains (Idson et al., 2004; Liberman et al., 2005). Our results suggest that when the incentives are framed in terms of gain, non-loss, loss or non-gain, their

perception, and the consequent effects on performance, could depend on the congruence with the individual's motivational state. The same rationale could be used for the investigation of positive and negative feedback efficacy (e.g., Förster, Grant, Idson, and Higgins, 2001).

A second possible implication is about communication. Our results suggest that the presentation of an outcome in terms of gain rather than non-loss could be more effective for individual judgment and behaviour, but only when the individual is in a promotion state; if the individual is in a temporary or chronic prevention state, this manipulation can be expected to fail. This rationale is consistent with the work of Zhao and Pechmann (2007) on advertising messages, where the authors demonstrated information to be more persuasive when the individual's regulatory focus, the message regulatory focus and the framing act synergically. Therefore, when an individual is promotion-focused, she is more strongly affected by a positive and gain-framed message; on the other hand, when an individual is prevention-focused, she is more strongly affected by a negative and loss-framed message.

Future research could apply the present experimental paradigm, based on an orthogonal manipulation of regulatory focus, outcome valence and framing, to related processes and phenomena.

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Appendix

Promotion/Prevention Scale

1. I am focused on preventing negative events in my life
2. I am anxious that I will fall short of my responsibilities and obligations.
3. I frequently imagine how I will achieve my hopes and aspirations.
4. I often think about the person I am afraid I might become in the future.
5. I often think about the person I would ideally like to be in the future.
6. I typically focus on the success I hope to achieve in the future.
7. I often imagine myself experiencing bad things that I fear might happen to me.
8. I frequently think about how I can prevent failures in my life.
9. I am more oriented toward preventing losses than I am toward achieving gains.
10. I often think about how I will achieve academic success.
11. I often worry that I will fail to accomplish my academic goals.
12. I see myself as someone who is primarily striving to reach my "ideal self"—to fulfil my hopes, wishes, and aspirations.
13. I see myself as someone who is primarily striving to become the self I "ought" to be—to fulfil my duties, responsibilities, and obligations.
14. In general, I am focused on achieving positive outcomes in my life.
15. I often imagine myself experiencing good things that I hope will happen to me.
16. Overall, I am more oriented toward achieving success than preventing failure.