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The Regret and Disappointment Scale: An instrument for assessing regret and disappointment in decision making

Francesco Marcatto* and Donatella Ferrante
Department of Psychology
University of Trieste

Abstract

The present article investigates the effectiveness of methods traditionally used to distinguish between the emotions of regret and disappointment and presents a new method — the Regret and Disappointment Scale (RDS) — for assessing the two emotions in decision making research. The validity of the RDS was tested in three studies. Study 1 used two scenarios, one prototypical of regret and the other of disappointment, to test and compare traditional methods ("How much regret do you feel" and "How much disappointment do you feel") with the RDS. Results showed that only the RDS clearly differentiated between the constructs of regret and disappointment. Study 2 confirmed the validity of the RDS in a real-life scenario, in which both feelings of regret and disappointment could be experienced. Study 2 also demonstrated that the RDS can discriminate between regret and disappointment with results similar to those obtained by using a context-specific scale. Study 3 showed the advantages of the RDS over the traditional methods in gambling situations commonly used in decision making research, and provided evidence for the convergent validity of the RDS.

Keywords: Regret, disappointment, measuring methods, Regret and Disappointment Scale.

1 Introduction

Emotions have a powerful impact on our lives: They shape our behavior, and their influence is so pervasive that no decision theory could be complete without taking their role into account. For example, we typically experience feelings of happiness and elation after having made a decision that leads to a good outcome for us. Conversely, we tend to experience negative and even painful feelings when wishing we had made a better decision. These and other emotions can be anticipated at the very moment a decision is made, influencing and guiding our choices thereby (Mellers, Schwartz, Ho & Ritov, 1997).

The emotion that is most frequently studied by decision theorists is regret, a counterfactual emotion that one experiences after realizing or imagining that a better outcome could have been obtained, had one decided differently. The experience of regret depends on choice- or behavior-focused counterfactual thoughts, and its intensity varies in relation to the availability of counterfactual alternatives (Kahneman & Tversky, 1982).

Economists and psychologists have been investigating the relation between regret and choice since the early 1980's, and there is now a general consensus concerning the influence of anticipated regret on decision making. Specifically, the anticipation of regret can increase the attractiveness of certain alternatives (Simonson, 1992). The same process can also function to promote health safety behavior (Richard, van der Pligt & de Vries, 1995; Richard, van der Pligt & de Vries, 1996) and computer security behavior (Wright & Ayton, 2005).

Although receiving less empirical focus, the effects of experienced regret have been more debated. For example, some studies have shown that feelings of regret diminish consumer satisfaction and intention to repeat purchases (Zeelenberg, Inman & Pieters, 2001) and that it also lowers Ultimatum Game players' offers (Zeelenberg & Beattie, 1997). Other authors, however, have found that experienced regret has a lower impact than is generally assumed (Gilbert, Morewedge, Risen & Wilson, 2004).

The emotion of disappointment is also based on counterfactual thinking: We feel disappointment when we find ourselves wishing that events of the world had turned out better for us. Yet, although regret and disappointment are different emotions, they are both generated by comparing "What is" with "What might have been". The emotion of regret results from a comparison between an actual outcome and a better outcome that might have occurred had another option been chosen (choice- or behavior-focused counterfactuals). Conversely, disappointment stems from the comparison of an actual outcome with a better out-

*Direct correspondence to Francesco Marcatto, Department of Psychology, University of Trieste, via S. Anastasio 12, 34134 Trieste, Italy. E-mail: marcatto@psico.units.it

Table 1: Composition of the RDS.

	Questionnaire Item	Description
1	I am sorry about what happened to me	Affective reaction
2	I wish I had made a different choice	Regret counterfactual
3	I wish the events that were beyond my control had happened differently	Disappointment counterfactual
4	I feel responsible for what happened to me	Internal attribution
5	The events that were beyond my control are the cause of what happened to me	External attribution
6	I am satisfied about what happened to me	Control item
7	Things would have gone better if... I had chosen differently The course of events had been different	Choice between counterfactuals

come that might have resulted had world events occurred differently (situation-focused counterfactuals) (van Djik, van der Pligt & Zeelenberg, 1999). It is important to note, that these differences in antecedent conditions of regret and disappointment also result in phenomenological differences and varying behavioral consequences (Ferrante & Marcatto, 2004; Zeelenberg, van Djik, Manstead & van der Pligt, 2000; Zeelenberg & Pieters, 1999).

1.1 Measuring regret and disappointment

To verify whether and to what extent participants actually feel regret or disappointment, decision-making researchers have traditionally used the method of asking direct questions, such as "How much regret do you feel?", with Likert-type scale responses (see e.g., Lönnqvist, Leikas, Paunonen, Nissinen & Verkasalo, 2006; van Dijk & Zeelenberg, 2005; Zhang, Walsh & Bonnefon, 2005; Arkes, Kung & Hutzel, 2002; Ordóñez & Connolly, 2000; van Dijk, van der Pligt & Zeelenberg, 1999; Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen & Reinderman, 1998). The method relies on the implicit assumption that participants can easily associate their feelings with a verbal label. Yet, can we assume that people automatically apply the meaning of terms like "regret" and "disappointment" to the complexity of their experienced emotions? This reservation and some inconsistencies in the literature (Ordóñez & Connolly, 2000; Zeelenberg, van Dijk & Manstead, 1998) led us to raise doubts concerning the adequacy of the traditional method and point to the need for a new type of methodology, which can measure regret by distinguishing it from disappointment.

We therefore chose to test the validity of the traditional method based on direct questions and to propose an indirect method for identifying experiences of regret and disappointment without explicitly referring to their verbal labels. We developed the Regret and Disappointment Scale (the "RDS") by drawing on appraisal theories of emotions, which hold that emotions are elicited by cognitive evaluations (appraisals) of antecedent conditions (Lazarus, 1991; Frijda, 1986). Regardless of the fact that the debate whether appraisals cause or merely characterize the emotions is still open, most emotion theorists agree that appraisals are key components of emotional experience (Zeelenberg, van Djik, Manstead & van der Pligt, 2000). We therefore developed the RDS by using cognitive appraisals to identify the emotions experienced by our participants. Specifically, we drew on the two-stage cognition-emotion process proposed by Weiner (1985), which distinguishes between a preliminary production of *outcome dependent* (or *attribution independent*) emotions and a secondary production of *attribution dependent* emotions. Weiner maintained that the outcome of an event first produces a general emotional reaction (such as happiness or sadness), based only on its perceived success or failure and regardless of its cause. More specific emotions are then generated through the causal ascription process: Attribution dependent emotions, such as surprise or regret, are determined by the perceived cause of the obtained outcome. The RDS (see Table 1) therefore assesses the two dimensions of a negative emotional experience, by measuring the *intensity* of the affective reaction and then categorizing the *type* of emotion experienced based on the cognitive antecedents of regret and disappointment.

We chose to adopt a very simple item to measure the *intensity* of the affective reaction: "I am sorry about what happened to me" (item 1), due to its evident ease of comprehension. In this way we can obtain a measure of the general negative feeling that is common to both regret and disappointment experiences, before attempting to understand whether participants would blame themselves for a bad outcome or would attribute a given outcome to cir-

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cumstances and misfortune. The item, "I am satisfied about what happened to me" (item 6), was added as a control item.

The cognitive antecedents used to categorize the *type* of emotion were derived from a definition of regret proposed recently by Camille et al.(2004), which synthesizes the main findings of the literature currently available on the topic (for example, Zeelenberg, van Djik, Manstead & van der Pligt, 2000; Mellers, Schwartz & Ritov, 1999; Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen & Reinderman, 1998). According to Camille et al. (2004) "Regret is a cognitively mediated emotion triggered by our capacity to reason counterfactually. Counterfactual thinking is the mechanism by which we compare "what is" with "what might have been". Contrary to mere disappointment, which is experienced when a negative outcome happens independently of our own decision, regret is an emotion strongly associated with a feeling of responsibility" (Camille, Coricelli, Sallet, Pradat-Diehl, Duhamel & Sirigu, 2004, p. 1167). Thus, *type* of emotion was inferred indirectly by using two pairs of items pertaining to the main cognitive antecedents of regret and disappointment: Internal/external responsibility and the realization that another decision or another state of the world would have been better (i.e., counterfactual thoughts). The first pair of items assessed participants' degree of agreement with the counterfactual thoughts proposed– that is, "I wish I had made a different choice" (item 2) for regret, and "I wish the events that were beyond my control had happened differently" (item 3) for disappointment. A second pair of items assessed attribution of responsibility, given that research findings have shown a strong connection between feelings of regret and internal responsibility (Zeelenberg, van Dijk & Manstead, 2000, 1998; Ordóñez & Connolly, 2000; Simonson, 1992) and, similarly, the connection between disappointment and external attributions. We therefore used the item "I feel responsible for what happened to me" (item 4) to assess internal attribution and the item "The events that were beyond my control are the cause of what happened to me" (item 5), for external attribution.

We added a seventh dichotomous discriminating item to identify the prevailing emotion, that is, to obviate the possibility of participants agreeing with both the regret and disappointment statements. Participants were asked to complete the sentence "Things would have gone better if…" by choosing one of two counterfactuals: "I had chosen differently" (regret counterfactual) or "the course of events had been different" (disappointment counterfactual). Thus, the RDS was composed of seven items: Six statements and a counterfactuals completion item. The participants were asked to rate their agreement with the statements using 7-point scales, anchored at 1 (*Not at all/Statement not pertinent*) and 7 (*Totally agree*) and to select one of the two possible counterfactuals in item 7.

Three studies were conducted to investigate the effectiveness of the traditional method and to test the validity of the RDS. In Study 1, two scenarios (regret vs. disappointment) were used to compare the RDS with the traditional direct questions of ("How much regret/disappointment do you feel?"). In Study 2, the RDS was tested in a more complex scenario by using a similar to real-life situation, in which both regret and disappointment feelings could be experienced. A further aim of Study 2 was to compare the RDS with a context-specific version of the scale. Study 3a used a classical decision making task -a gambling situation- to test the RDS' advantages over the traditional method as had been shown in Study 1. In Study 3b the convergent validity of the RDS was tested by correlating RDS Indexes with the Regret Scale (Schwartz, Ward, Monterosso, Lyubomirsky, White & Lehman, 2002).

2 Study 1

The aim of Study 1 was to test the construct validity of the RDS and to compare it with the traditional direct question method. Participants received either a regret or a disappointment scenario and were requested to respond to either the RDS items or the traditional direct questions. The results obtained using the different methodologies were then compared.

2.1 Method

2.1.1 Participants

A total of 333 undergraduate students from the Universities of Trieste and Udine voluntarily participated in the experiment. They were randomly assigned to a scenario condition (regret or disappointment) and to one of three measuring method conditions (RDS; single regret or disappointment direct question; both the regret and the disappointment direct questions).

2.1.2 Materials and procedure

We created two scenarios describing simple prototypical regret and disappointment situations. The scenarios had been tested in a pilot study using the production of counterfactual thoughts to verify whether participants actually perceived the scenarios as regret or disappointment situations. The scenarios described imaginary events that eventually caused the participant to miss an important work meeting: The bad outcome in the regret scenario was presented as a consequence of the participant's decision, and the unfavorable outcome in the disappointment

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Table 2: RDS, principal component analysis, varimax rotated 2-component solution.

	Factor 1 (*Type of emotion*)	Factor 2 (*Intensity of affective reaction*)
Item 1 (*Affective reaction*)	−.039	.870
Item 2 (*Regret crf*)	−.605	.293
Item 3 (*Disappointment crf*)	.799	.289
Item 4 (*Internal attribution*)	−.818	.230
Item 5 (*External attribution*)	.863	.044
Item 6 (*Control item*)	.030	−.627

scenario was presented as the effect of external and uncontrollable events[1]. The scenarios and pilot study results are presented in Appendix A.

The entire experiment was conducted in Italian. The scenario and measuring method were presented on the same page, and most participants completed the task in a few minutes. Participants received either the regret or the disappointment scenario and their emotional reactions were assessed using one of the three following measuring methods:

1. RDS;
2. Traditional method 1 — Single direct question: Half of these participants received the traditional regret question only ("How much regret do you feel?"), and the other half received the traditional disappointment question only ("How much disappointment do you feel?"), regardless of the scenario presented;
3. Traditional method 2 — Two direct questions: Each participant received both traditional regret and disappointment questions (in balanced presentation order), "How much regret do you feel?" and "How much disappointment do you feel?" regardless of the scenario presented.

"Traditional method 1" is the most common methodology present in the literature. "Traditional method 2" is also used in studies that use a within design to highlight the differences between the two terms.

Participants responded to the traditional direct question(s) by using a 7-point Likert scale anchored at 1 (*Not at all*) and 7 (*A great deal*).

[1]We adopted the broad definition of disappointment that is commonly used in decision making research, that is, the negative emotion that originates from a comparison between a factual outcome and a counterfactual outcome, which might have been, had another state of the world occurred (Zeelenberg, van Dijk, van der Pligt, Manstead, van Empelen & Reinderman, 1998). The results of the pilot study confirmed the availability of external counterfactuals in the disappointment scenario (see Appendix A).

2.2 Results

2.2.1 RDS condition

The RDS was presented to 89 participants: 44 received the regret scenario and 45 the disappointment scenario. Three participants in the disappointment scenario condition were excluded from subsequent analysis: One, for failing to respond to all of the items and two, because they had higher values on the control item (item 6, "*I am satisfied about what happened to me*") than on the affective reaction item (item 1, "*I am sorry about what happened to me*").

The principal component analysis (see Table 2) confirmed a 2-component solution, which was coherent with the theoretical construction of the RDS. The first factor, on which the two counterfactual items and the two attribution items loaded, referenced *Type of emotion*. The second factor, on which the affective reaction item and the control item loaded, represented *Intensity of affective reaction*.

Intensity of affective reaction (item 1) was very similar for both scenarios (regret scenario: M = 5.70, SD = 1.17; disappointment scenario: M = 5.52, SD = 1.43; t = .641, p = .523, d = 0.125).

The Regret Index (mean of items 2 and 4, Cronbach's α = .64) and the Disappointment Index (mean of items 3 and 5, Cronbach's α = .78) were calculated for each participant. The mean values of the Regret and Disappointment Indexes are shown in Figure 1, Panel A.

A 2 (Scenario: Regret vs. Disappointment) x 2 (Index: Regret vs. Disappointment) ANOVA yielded a significant main effect for Index ($F_{(1,84)}$ = 4.119, $p < .05$, η^2 = .047) and a significant interaction ($F_{(1,84)}$ = 95.623, $p < .001$, η^2 = .532), but no main Scenario effect emerged ($F_{(1,84)}$ = .452, p = .503, η^2 = .005).

The main Index effect showed that participants had higher scores on Disappointment Index items (M = 4.62) than on Regret Index items (M = 4.18). The significant interaction corroborated the validity of the RDS: The Regret Index was higher for the regret scenario (M = 5.39)

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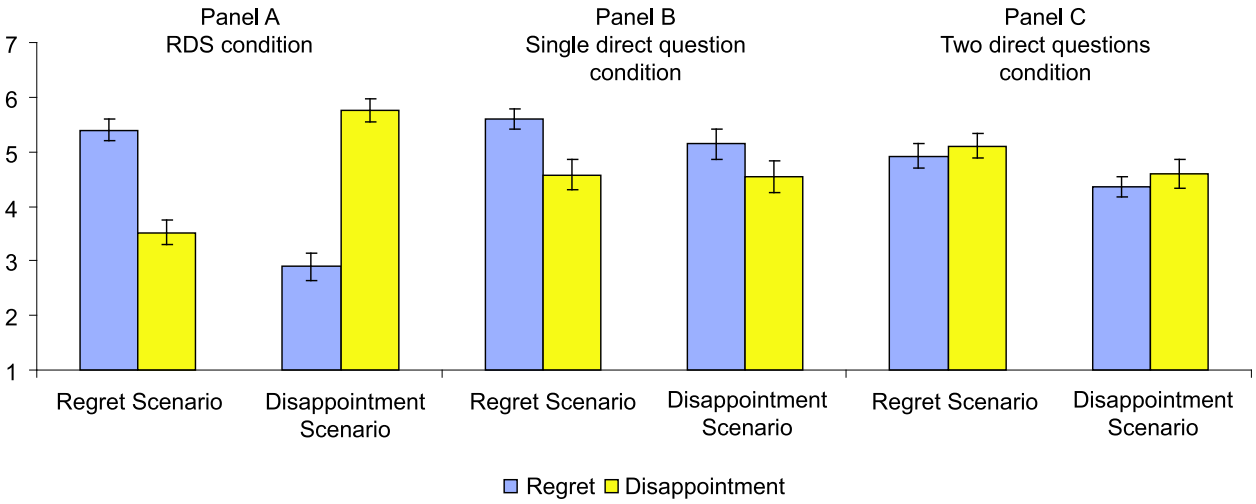

Figure 1: Mean regret and disappointment ratings obtained using RDS, a single direct question, or two direct questions (error bars represent standard error).

Table 3: Counterfactual choice frequencies (item 7) in RDS.

	Scenario	
	Regret	Disappointment
Change choice	34	5
Change external events	10	37

than for the disappointment scenario (M = 2.90), while the Disappointment Index was higher for the disappointment scenario (M = 5.76) than for the regret scenario (M = 3.52).

As reported in Table 3, when responding to item 7 ("*Things would have gone better if*...") the regret scenario participants more frequently selected the counterfactual that was presented as being their own choice, and the disappointment scenario participants more frequently selected the counterfactual that was presented as pertaining to external events ($\chi^2_{1,86} = 37.048$, $p < .001$, *Contingency Coefficient* = .549).

A binary logistic regression was performed to determine whether the Regret and Disappointment Index scores and Intensity of affective reaction scores could be used to predict participants' choices between the two counterfactuals. Results showed that only the Regret Index predicted participant choice: High Regret Index scores were associated with a wish to go back and change the choice, and low Regret Index scores were associated with external counterfactuals ($B = -1.274$, Wald = 24.053, $p < .001$; Change choice was coded 0 and Change external events was coded 1).

2.2.2 Single direct question condition

One-hundred and forty participants received a scenario and a single direct question, in a 2 (Scenario: Regret vs. Disappointment) × 2 (Type of question: Regret vs. Disappointment) between subjects design.

The results are shown in Figure 1, Panel B. The ANOVA yielded a significant main effect for Type of question ($F_{(1,138)} = 9.451$, $p < .01$, $\eta^2 = .065$), but no main effect for Scenario ($F_{(1,138)} = .841$, $p = .361$, $\eta^2 = .006$) and, most importantly, no interaction ($F_{(1,138)} = .655$, $p = .420$, $\eta^2 = .005$) was observed. Participants who received the regret question reported higher values (M = 5.37) than those receiving the disappointment question (M = 4.56), regardless of the scenario presented. Interestingly, in the disappointment scenario, the regret question received higher ratings (M = 5.14) than the disappointment question did (M = 4.54).

2.2.3 Two direct question condition

One-hundred and four participants received a scenario and both the regret and the disappointment direct questions (in balanced presentation order), in a 2 (Scenario: Regret vs. Disappointment, between subjects) × 2 (Type of question: Regret and disappointment, within subjects) mixed design.

The results are shown in Figure 1, Panel C. The ANOVA yielded only a marginal significant main effect for Scenario ($F_{(1,102)} = 3.668$, $p = .058$, $\eta^2 = .035$), but no main effect for Type of question ($F_{(1,102)} = 1.739$, $p = .190$, $\eta^2 = .017$) and no interaction ($F_{(1,102)} = .035$, $p = .851$, $\eta^2 = .001$) were observed. As in the single direct question condition, the traditional measuring method

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Table 4: RDS, Principal component analysis, varimax rotated 2-component solution.

	Factor 1 (*Type of emotion*)	Factor 2 (*Intensity of affective reaction*)
Item 1 (*Affective reaction*)	−.055	.694
Item 2 (*Regret crf*)	−.550	−.221
Item 3 (*Disappointment crf*)	.741	.026
Item 4 (*Internal attribution*)	−.783	.300
Item 5 (*External attribution*)	.627	−.536
Item 6 (*Control item*)	−.074	−.864

did not allow us to clearly identify what emotion the participants were experiencing, a result suggesting that the participants failed to match their feelings with the appropriate verbal label.

2.2.4 Comparison between methods

A 2 (Measuring Method: RDS vs. Two direct questions) ×2 (Scenario: Regret vs. Disappointment) × 2 (Type of emotion: Regret vs. Disappointment) mixed ANOVA compared the RDS method and the two direct question method. Results showed a significant main effect for Measuring Method ($F_{(1,186)} = 3.986$, $p < .05$, $\eta^2 = .021$); a significant main effect for Type of emotion ($F_{(1,186)} = 6.261$, $p < .05$, $\eta^2 = .033$); a significant interaction between Scenario and Type of emotion ($F_{(1,186)} = 74.778$, $p < .001$, s$\eta^2 = .287$); and overall, a significant 3-way interaction among Measuring Method, Scenario, and Type of emotion ($F_{(1,186)} = 71.219$, $p < .001$, $\eta^2 = .277$), confirming a clear difference between the two methods in distinguishing between regret and disappointment.[2]

2.3 Discussion

The RDS proved to be a valid instrument for discriminating between the emotions of regret and disappointment. Specifically, a principal component analysis revealed the solidity of the two dimensions composing the scale: *Intensity of affective reaction* and *Type of emotion*. Moreover, the Regret and Disappointment Index ratings consistently varied in function of scenarios. Conversely, the traditional direct question methods were found to be inadequate for distinguishing between the emotions of regret and disappointment, given that the expected pattern — that is, high regret scores for the regret scenario and high disappointment scores for the disappointment scenario – were observed only in the RDS conditions.

3 Study 2

Study 1 tested the RDS by using two well defined scenarios, in which only one type of counterfactual (based on either choice or external events) was easy to construct. Yet, both laboratory and real life situations typically present various types of counterfactuals available. Study 2 was therefore aimed at testing the RDS in a single scenario in which the negative outcome could be seen as having been avoidable based either on the personal decision or on the external events.

A further aim of Study 2 addressed the fact that the RDS had been developed using general items, so as to render it easily applicable to different situations and contexts. We wondered, however, whether this choice had created difficulties for participants in matching the items with the specific scenario content. We therefore compared the RDS with another, context-specific version (the "cRDS" from here on in) to verify whether the task of answering general, context unrelated questions might have influenced the ratings in Study 1.

3.1 Method

3.1.1 Participants

A total of 100 undergraduate students from the University of Trieste voluntarily took part in the experiment and were randomly assigned to the RDS or to the cRDS conditions.

3.1.2 Materials and procedure

The single scenario presented to participants was a slightly modified version of the regret scenario used in Study 1. It was modified with the idea of introducing an external event (i.e., a neighbor, parking in front of the participants' garage and delaying his/her departure thereby),

[2] No significant effect for Scenario ($F_{(1,186)} = 3.530$, $p = .062$, $\eta^2 = .019$), no interaction between Measuring Method and Type of emotion ($F_{(1,186)} = 1.090$, $p = .298$, $\eta^2 = .006$) and no interaction between Measuring Method and Scenario ($F_{(1,186)} = 1.326$, $p = .251$, $\eta^2 = .007$) emerged.

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Table 5: Mean RDS and cRDS item ratings (standard deviations in parenthesis); ratings ranged from 1 to 7.

Item	RDS	cRDS
1 (*Affective reaction*)	6.23 (1.04)	6.06 (1.31)
2 (*Regret crf*)	5.17 (1.78)	5.27 (1.89)
3 (*Disappointment crf*)	5.04 (1.88)	5.73 (1.71)
4 (*Internal attribution*)	5.58 (1.69)	5.77 (1.85)
5 (*External attribution*)	2.98 (1.52)	3.40 (2.13)
6 (*Control item*)	1.33 (0.72)	1.35 (0.96)

which contributed to the bad outcome. The unfavorable outcome could therefore have been avoided had either the personal decision or external events been different.

The cRDS was obtained by modifying the original RDS items to more closely fit the scenario; the scenario is presented together with the cRDS in Appendix B.

Participants received the scenario and either the RDS or the cRDS on the same page; most participants completed the task in a few minutes. The experiment was conducted in Italian. The measuring method was used in a between-subjects design to assess the participants' emotional reactions to the presented scenario.

3.2 Results and discussion

Data for four participants (two in the RDS condition and two in the cRDS condition) were excluded from the analysis because these participants had higher values on the control item (item 6) than on the affective reaction item (item 1).

The principal component analysis (see Table 4) confirmed the same 2-component RDS solution as yielded in Study 1: *Type of emotion* (Factor 1) and *Intensity of affective reaction* (Factor 2). Attribution items (item 4 and 5) also loaded on Factor 2.

As in Study 1, Intensity of affective reaction (item 1), the Regret Index (mean of items 2 and 4) and the Disappointment Index (mean of items 3 and 5) were calculated for each participant. The average affective reaction score was rather high (M = 6.23, SD = 1.04), and the Regret Index (M = 5.37, *SD* = 1.38) was observed to be higher than the Disappointment Index (M = 4.01, *SD* = 1.42), $t = 3.982$, $p < .001$, $d = 0.985$. Responses to item 7 were coherent with this result: Participants more frequently selected the internal counterfactual (77%) than they did the external counterfactual (33%), $\chi^2_{1,86} = 14.083$, $p < .001$.

A binary logistic regression revealed that the Regret Index predicted participants' choice between the two counterfactuals (item 7): High Regret Index scores were associated with the wish that one had chosen differently, and low Regret Index scores were associated with the wish that the course of events had been different (B = -.913, Wald = 8.483, $p < .01$; Change choice was coded 0 and Change external events was coded 1).

Table 6: Counterfactual choice frequencies (item 7) in RDS and cRDS conditions.

	RDS	cRDS
Change choice	37	35
Change external events	11	13

3.2.1 RDS and cRDS Comparison

As reported in Table 5, the RDS ratings were very similar to those obtained using the cRDS, showing only a slight difference for the disappointment items (item 3 and item 5). A 2 (Type of scale: RDS vs. cRDS) × 6 (Item) ANOVA yielded only the expected significant main effect for Item ($F_{(5,94)} = 218.471$, $p < .001$, $\eta^2 = .924$), and no main effect for Type of the scale ($F_{(1,94)} = 3.119$, $p = .081$, $\eta^2 = .032$); no interactions were observed ($F_{(5,94)} = .857$, $p = .513$, $\eta^2 = .045$).

As reported in Table 6, answers to item 7 were highly similar for both scales ($\chi^2_{1,96} = .222$, $p = .637$, *Contingency Coefficient* = .048).

These results showed the robustness of the RDS, because the method maintained a high level of coherence in a situation presenting both regret and disappointment counterfactuals, and because it was not less effective than a specifically constructed, context-related scale.

4 Studies 3a and 3b

The aim of Studies 3a and 3b was to provide further evidence for the validity of the RDS and to address possible limitations in the previous studies.

Study 1 had tested the validity of the RDS by using two scenarios, one of which was assumed to be a regret scenario and the other a disappointment scenario. This assumption was based on the type of the most available counterfactual in the two scenarios (see the pilot study in Appendix A). At the same time, however the type of counterfactual was one of the two elements on which the Regret and Disappointment Indexes were based. Thus in Study 3a the RDS was tested and compared with the direct question method. Study 3a used simple gambling situations, in which feelings of regret and disappointment depended on the manipulation of feedback (knowing or not knowing the outcome of the alternative choice) to compare the RDS with the direct question method.

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Study 3b was aimed at providing a measure of convergent validity, by correlating the RDS with the Regret Scale (Schwartz, Ward, Monterosso, Lyubomirsky, White & Lehman, 2002).

5 Study 3a

5.1 Method

5.2 Participants

A total of 140 undergraduate students from the University of Trieste voluntarily participated in the experiment. They were randomly assigned to a scenario condition (regret or disappointment) and to one of two measuring method conditions (RDS or both regret and disappointment direct questions).

5.2.1 Materials and procedure

The procedure was identical to the one used in Study 1, with the exception of the scenario, which was an adapted version of "choice between gambles" situations traditionally used in decision making research (Camille, Coricelli, Sallet, Pradat-Diehl, Duhamel & Sirigu, 2004; Mellers, Schwartz & Ritov, 1999; Mellers, Schwartz, Ho & Ritov, 1997). The scenario described a choice between two gambles with the same expected value. In the disappointment scenario, the participants received a feedback concerning only the outcome of the selected gamble (a losing outcome); in the regret scenario, the participants received feedback also concerning the outcome of the non-selected gamble (a winning outcome). Both Scenarios are reported in Appendix C.

5.3 Results

5.3.1 RDS

Eighty participants received one of the two above-described scenarios and the RDS. Four participants in the disappointment condition and one in the regret condition reported higher values on the control item than on the affective reaction item, and their data were excluded from subsequent analysis.

Intensity of affective reaction (item 1) was higher in the regret scenario (M = 5.62, SD = 1.63) than in the disappointment scenario (M = 4.81, SD = 1.64) ($t = 2.156$, $p = .034$, $d = 0.494$).

As in Studies 1 and 2, the Regret Index (mean of items 2 and 4) and the Disappointment Index (mean of items 3 and 5) were calculated. A 2 (Scenario: Regret vs. Disappointment) x 2 (Index: Regret vs. Disappointment) ANOVA yielded a significant Scenario effect ($F_{(1,73)} = 8.712$, $p < .01$, $\eta^2 = .107$), a significant main Index effect ($F_{(1,73)} = 75.817$, $p < .001$, $\eta^2 = .509$) and a significant interaction ($F_{(1,73)} = 31.020$, $p < .001$, $\eta^2 = .298$).

Table 7: Counterfactual choice frequencies (item 7).

	Scenario	
	Regret	Disappointment
Change choice	15	2
Change external events	24	34

The significant interaction showed that RDS scores varied coherently with the two scenarios: The Regret Index was higher in the regret scenario (M = 4.15) than in the disappointment scenario (M = 2.25), while the Disappointment Index was higher in the disappointment scenario (M = 5.46) than in the regret scenario (M = 4.86).

As reported in Table 7, item 7 answers (choice between counterfactuals) differed between the two scenarios ($\chi^2_{1,75} = 11.564$, $p < .001$, *Contingency Coefficient* = .365).

A binary logistic regression showed that both the Regret and Disappointment Indexes predicted choice between the two counterfactuals (Regret Index: $B = -.867$, Wald = 12.196, $p < .001$; Disappointment Index: $B = .684$, Wald = 7.103, $p < .01$; Change choice was coded 0 and Change external events was coded 1).

5.3.2 Two direct questions

Sixty participants received a scenario and both the regret and the disappointment direct questions (in balanced presentation order).

A 2 (Scenario: Regret vs. Disappointment, between subjects) × 2 (Type of question: Regret and disappointment, within subjects) ANOVA yielded no significant results[3]. As in Study 1, the regret and disappointment ratings obtained in the direct question condition were highly similar for both the regret scenario (M = 4.15 for regret and M = 4.53 for disappointment) and the disappointment scenario (M = 3.93 for regret and M = 3.57 for disappointment).

6 Study 3b

To examine the convergent validity of the RDS, the scores of the RDS were correlated with Regret Scale scores (Schwartz, Ward, Monterosso, Lyubomirsky, White & Lehman, 2002). The Regret Scale is a 5-item measure

[3]No significant effect for Scenario ($F_{(1,58)} = 3.119$, $p = .083$, $\eta^2 = .051$), no significant effect for Type of question ($F_{(1,58)} = .142$, $p = .707$, $\eta^2 = .002$) and no interaction between Scenario and Type of question ($F_{(1,58)} = 1.646$, $p = .205$, $\eta^2 = .028$) were yielded.

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Table 8: Composition of the Regret Scale.

Item 1	Whenever I make a choice, I'm curious about what would have happened if I had chosen differently
Item 2	Whenever I make a choice, I try to get information about how the other alternatives turned out
Item 3	If I make a choice and it turns out well, I still feel like something of a failure if I find out that another choice would have turned out better
Item 4	When I think about how I'm doing in life, I often assess opportunities I have passed up
Item 5	Once I make a decision, I don't look back

Note. Participants responded using a 7-point Likert scale, anchored at 1 (*Completely disagree*) and 7 (*Completely agree*). Item 5 was reverse-coded for analysis.

that assesses tendency to feel regret, that is, a personality measure of sensibility to regret in real life decisions. We therefore decided to correlate this measure with the RDS Regret and Disappointment Indexes obtained using the real-life scenario used in Study 2.

6.1 Method

6.1.1 Participants, materials and procedure

A total of 49 undergraduate students from the University of Trieste voluntarily participated in the experiment. They received the scenario used in Study 2 and the RDS on the same page, and Schwartz et al.'s (2002) Regret Scale on a second page. The items of the Regret Scale are reported in Table 8.

6.2 Results

Two participants had higher values on the RDS control item than on the RDS affective reaction item; their data were therefore excluded from subsequent analysis. The correlation between the RDS Regret Index and the Regret Scale was .371, $p = .010$, suggesting that both scales pertained to the same construct of regret, whereas no significant correlation between RDS Disappointment Index and the Regret Scale was observed ($r = -.149$, $p = .318$).

7 General discussion

Decision researchers investigating the influence of regret on choices must frequently measure if and to what extent participants feel regret. As occurs with most emotions, measuring regret is not an easy task. The present paper raised questions concerning the use of the traditional method based on direct questions, such as "How much regret do you feel?" and proposed a new instrument for assessing regret and discriminating it from disappointment. Study 1 tested the validity of the traditional direct question method in a between-subjects condition and in a within-subjects condition, using scenarios in which regret and disappointment depended on the availability of choice-focused or situation-focused counterfactuals. Results showed that direct questions did not adequately discriminate the two emotions, because the regret and disappointment ratings that emerged were very similar. In Study 3a, the direct question methodology was tested using gambling scenarios, in which regret and disappointment depended on the presence or absence of feedback about the foregone alternative. Once again, direct question methodology provided ambiguous results, which were inconsistent with the scenario presented. Hence, our results obtained with traditional direct questions were inconsistent with the notion of regret usually adopted by decision researchers. We obtained quite different results, however, with the Regret and Disappointment Scale (RDS), which uses a different approach for identifying and measuring regret and disappointment. The method is based on the cognition-emotion process proposed by Weiner (1985), who maintains that cognition influences and leads to an emotion in a two-stage process: Production of general positive or negative emotions, based on outcome evaluation, and generation of more distinct emotions, based on cognitive appraisal. The RDS separates the measure of negative affective reaction, which is common to both regret and disappointment experiences, from its categorization as regret or disappointment. Specifically, the RDS uses an indirect method to categorize the experienced emotion as regret or disappointment based on their main cognitive antecedents (counterfactual production and causal attribution), without making reference to the potentially ambiguous terms of "regret" and "disappointment". Thus, the RDS provides three different scores: A measure of affective reaction, a Regret Index (based on choice-focused counterfactuals and internal attribution), and a Disappointment Index (based on event-focused counterfactuals and external attribution).

Results obtained using the RDS showed that the Regret and Disappointment Indexes varied coherently with the scenarios, differently from what occurred with the traditional direct questions. Study 1 compared scenarios in

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which regret and disappointment depended on the availability of choice- or situation-focused counterfactuals and yielded similar scores for affective reaction, higher Regret Index than Disappointment Index scores in the regret scenario, and higher Disappointment Index than Regret Index scores in the disappointment scenario. Study 3a used a classical decision making scenario in which participants' emotions depend on the presence or absence of the foregone alternative's feedback. The RDS ratings observed showed a difference in both affective reaction to the scenarios (the regret scenario was more painful than the disappointment scenario) and in the categorization of emotions.

The validity of the RDS was also tested. In Study 1 a principal component analysis revealed the scale's two-factor structure (Intensity of affective reaction and Type of emotion), confirming the construct validity of the RDS thereby. The results of Study 2 corroborated the construct validity of the RDS and provided further proof of its external validity in a real-life scenario. We therefore found that the instrument can be extended to situations in which both the emotions of regret and disappointment can be experienced, and where many different events can serve as antecedents for the production of counterfactual thoughts. Furthermore, the results of Study 2 showed that the RDS' capacity to discriminate between regret and disappointment is similar to that which would be obtained by using a content specific version of the RDS. Lastly, Study 3b tested the convergent validity of the RDS, showing a positive correlation between the RDS Regret Index and scores on the Regret Scale (Schwartz, Ward, Monterosso, Lyubomirsky, White & Lehman, 2002), a trait measure of tendency to experience regret, suggesting that both instruments share the construct of regret.

Hence, the RDS proved to be a valid instrument, which can provide a cognitive-based categorization of regret and disappointment experiences and a measure of the intensity of the negative affective reaction involved. The present paper tested the RDS by using a scenario methodology only, but a recent study (Marcatto & Ferrante, 2007) based on real choices has provided a proof of the RDS' external validity: We followed Zeelenberg et al's "feeling-is-for-doing" approach (this issue; Zeelenberg, Nelissen & Pieters, 2007) and used the RDS to explain the different behavioral consequences of regret and disappointment emotions in a real choice situation. Results showed that the Regret Index scores were good predictors of participants' subsequent choices, given that high Regret Index scores effectively predicted switching behavior from optimal to suboptimal choices.

Overall, the findings of the present paper point to a need for caution in the use of direct question methodology. Indeed, direct questions of regret and disappointment might not actually provide true categorization of experienced emotions — perhaps because participants find it difficult to match the terms "regret" and "disappointment" with their own emotional states.

A careful analysis of the literature indicates that the problem may not be specific to the Italian language, but could be more widespread. For example, Ordóñez and Connolly (2000) observed high ratings of regret in what was clearly, instead, a disappointment situation (the scenario's protagonist had no possibility of influencing the outcome) and vice versa, they observed high disappointment ratings in the regret scenario.

The inconsistent data reported in literature may also depend, at least partially, on different uses and understandings of the words "regret" and "disappointment" among participants and between participants and decision researchers. For example, Ordóñez and Connolly (2000, p. 141) commented on their results by specifying that "it is clear that the referents to which our subjects attach the terms 'regret' and 'disappointment' do not correspond neatly to the referents proposed by regret and disappointment theories." Wright and Ayton (2005, p. 762) expressed a similar consideration: "Regret Theory labels the post-decisional affect as 'regret' but of course people may identify a number of different semantic terms for these emotions".

The definitions of "regret" reported in the Merriam-Webster Dictionary (2003) as 1) "sorrow aroused by circumstances beyond one's control or power to repair" and 2) "an expression of distressing emotion (as sorrow or disappointment)" reinforce the idea of a difference between the meaning of the word in common language and in decision-making research. As Zeelenberg, van Dijk and Manstead (2000, p.152) wrote, "If the familiar usage of 'regret' does not coincide with the strict counterfactual definition proposed by regret theory, the findings of such studies may carry few implications for regret theory or disappointment theory."

The Regret and Disappointment Scale presented in this paper could represent a possible solution to the problem, as it does not contain the words "regret" and "disappointment" but uses a different method, based on cognitive appraisal, to measure the negative emotion experienced by participants and to categorize it as regret or disappointment. Regardless of the debate on the cognitive appraisal theories of emotions, and although we imagine that there might be developed better methods to study emotions in their various experiential contents, we believe that the RDS represents a useful instrument for decision making researchers' purposes. Indeed, it provides a measure of affective response and makes it possible to verify whether the cognitive antecedent conditions of these emotions (the information most required by decision making researchers) are satisfied.

References

Arkes, H. R., Kung, Y. H., & Hutzel, L. (2002). Regret, valuation, and action inertia. *Organizational Behavior and Human Decision Processes, 87*, 371–385.

Camille, N., Coricelli, G., Sallet, J., Predat-Diehl, P., Duhamel, J. R., & Sirigu, A. (2004). The involvement of the orbitofrontal cortex in the experience of regret. *Science, 304*, 1167–1170.

Cohen, J. (1977). *Statistical Power Analysis for the Behavioral Sciences* (rev. ed.), New York: Academic Press.

Ferrante, D., & Marcatto, F. (2004). Emotions and decision-making: The influence of experienced regret on choice. *Happiness, Economics and Interpersonal Relationship, Abstracts of the conference*, December 3–4, Trento (Italy).

Fridja, N. H. (1986). The *emotions.* Cambridge, England: Cambridge University Press.

Gilbert, D. T., Morewedge, C. K., Risen, J. L., & Wilson, T. D. (2004). Looking forward to looking backward. *Psychological Science*, *15*, 346–350.

Girotto, V., Legrenzi, P, & Rizzo, A. (1991). Event controllability in counterfactual thinking. *Acta Psychologica, 78*, 111–133.

Kahneman, D., & Tversky, A. (1982). The simulation heuristic. In Kahneman, D., Slovic, P., & Tversky, A. (Eds.). *Judgment under uncertainty: Heuristics and biases*, New York: Cambridge University Press, 201–208.

Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311–328.

Lazarus, R. (199l). *Emotions and adaptation.* New York: Oxford University Press.

Lönnqvist, J. E., Leikas, S., Paunonen, S., Nissinen, V., & Verkasalo, M. (2006). Conformism moderates the relations between values, anticipated regret, and behavior. *Personality and Social Psychology Bulletin, 32*, 1469–1481.

Marcatto, F., & Ferrante, D. (2007). When good decisions have a bad outcome: A biasing effect of experienced regret on subsequent choices. *Paper presented at the SJDM (Society for Judgment and Decision Making) Conference*, November 16–19, Long Beach, CA.

Mellers, B. A., Schwartz, A., Ho, K., & Ritov, I. (1997). Decision affect theory: Emotional reactions to the outcomes of risky options. *Psychological Science, 8*, 423–429.

Mellers, B. A., Schwartz, A., & Ritov, I. (1999). Emotion-Based choice. *Journal of Experimental Psychology: General, 128*, 332–345.

Merriam-Webster's Collegiate Dictionary, Eleventh Edition. (2003). Springfield, MA: Merriam-Webster.

Ordóñez, L. D., & Connolly, T. (2000). Regret and responsibility: A reply to Zeelenberg et al. (1998). *Organizational Behavior and Human Decision Processes, 81*, 132–142.

Richard, R., van der Pligt, J., & de Vries, N. (1995). Anticipated affective reactions and prevention of AIDS. *British Journal of Social Psychology, 34*, 9–21.

Richard, R., van der Pligt, J., & de Vries, N. (1996). Anticipated regret and time perspective: Changing sexual risk-taking behavior. *Journal of Behavioral Decision Making, 9*, 185–199.

Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*, 1178–1197.

Simonson, I. (1992). The influence of anticipating regret and responsibility on purchase decisions. *Journal of Consumer Research, 19*, 105–118.

Van Dijk, W. W., van der Pligt, J., & Zeelenberg, M. (1999). Effort invested in vain: The impact of effort on the intensity of disappointment and regret. *Motivation and Emotion, 23*, 203–220.

Van Dijk, E., & Zeelenberg, M. (2005). On the psychology of 'If only': Regret and the comparison between factual and counterfactual outcomes. *Organizational Behavior and Human Decision Processes, 97*, 152–160.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548–573.

Wright, C., & Ayton, P. (2005). Focusing on what happen and how it could feel: Can the anticipation of regret change students' computing-related choices? *International Journal of Human-Computer Studies, 62*, 759–783.

Zeelenberg, M., & Beattie, J. (1997). Consequences of regret aversion 2: Additional evidence for effects of feedback on decision making. *Organizational and Human Decision Processes, 72*, 63–78.

Zeelenberg, M., Inman, J. J., & Pieters, R. G. M. (2001). What we do when decisions go awry: Behavioral consequences of experienced regret. In Weber, E. U., Baron, J., & Loomes, G. (Eds.). *Conflict and Tradeoffs in Decision Making*, Cambridge: Cambridge University Press, 136–155.

Zeelenberg, M., Nelissen, R. M. A., & Pieters, R. (2007). Emotion, motivation and decision

making: A feeling is for doing approach. In Plessner, H., Betsch, C., & Betsch, T. (Eds.).

Intuition in judgment and decision making, Mahway, NJ: Erlbaum, 173–189.

Zeelenberg, M., & Pieters, R. (1999). Comparing service delivery to what might have been: Behavioral re-

sponses to disappointment and regret. *Journal of Service Research, 2*, 86–97.

Zeelenberg, M., van Dijk, W. W., & Manstead, A. S. R. (1998). Reconsidering the relation between regret and responsibility. *Organizational Behavior and Human Decision Processes, 74*, 254–272.

Zeelenberg, M., van Dijk, W. W., Manstead, A. S. R., & van der Pligt, J. (2000). On bad decisions and disconfirmed expectancies: The psychology of regret and disappointment. *Cognition and Emotion, 14*, 521–541.

Zeelenberg, M., van Dijk, W. W., & Manstead, A. S. R. (2000). Regret and responsibility resolved? Evaluating Ordóñez and Connolly's (2000) conclusions. *Organizational Behavior and Human Decision Processes, 81*, 143–154.

Zeelenberg, M., van Dijk, W. W., van der Pligt, J., Manstead, A. S. R., van Empelen, P., & Reinderman, D. (1998). Emotional reactions to the outcomes of decisions: The role of counterfactual thought in the experience of regret and disappointment. *Organizational Behavior and Human Decision Processes, 75*, 117–141.

Zhang, J. H., Walsh, C., & Bonnefon, J. F. (2005). Between-subject or within-subject measures of regret: Dilemma and solution. *Journal of Experimental Social Psychology, 41*, 559–566.

Appendix A

Regret scenario (translated from the original Italian text)

Imagine you are in your office. Tomorrow, you and your colleague have to go to an important work meeting by train. Your colleague, who is an early riser, proposes that you meet very early and drive to the train station together. You decline his proposal, because you prefer to sleep a bit longer and to travel to the station by yourself, since tonight you have been invited to a birthday party and you imagine that you will come home late. The next day you are so tired that you don't hear the alarm clock; you wake up late and miss your train, but your colleague manages to catch it.

Disappointment scenario (translated from the original Italian text)

Imagine you are in your office. Tomorrow, you and your colleague have to go to an important work meeting by train. Your colleague, who is an early riser, proposes that you meet very early and drive to the train station together. You decline his proposal, because you prefer to sleep a bit longer and to travel to the station by yourself, since tonight you have been invited to a birthday party and you imagine that you will come home late. The next day, even though you are tired, you manage to wake up early and to leave home in time to catch the train. Shortly after the train departs, it stops due to engine trouble. After more than an hour's wait, the engine is fixed, but at this point you are unable to reach the meeting on time.

Table 9: Pilot study: Internal and external counterfactual frequencies for the regret and disappointment scenarios.

Scenario	Internal Counterfactual	External Counterfactual
Regret	18	2
Disappointment	8	9

Pilot study

Forty students from the University of Udine were presented with a scenario (regret or disappointment version), and were asked to complete the sentence "If only…" producing at least one counterfactual. The first counterfactual produced by each participant was coded by three judges as an internal or external, in function of whether they respectively changed the protagonist's choice and actions or events beyond his/her control. Data for three participants in the disappointment scenario condition were excluded from the analysis, because these participants did not produce counterfactuals but generic comments only.

Table 9 presents the participant-produced counterfactuals. As expected, the counterfactuals differed significantly for the two scenarios: Most regret scenario readers produced internal counterfactuals, and more than half of the disappointment scenario readers produced external counterfactuals ($\chi^2_{1,37} = 8.111$, $p < .01$, *Contingency Coefficient* = .424). The results of the disappointment scenario were consistent with its theoretical construction, given that literature suggests that people tend to mutate controllable events (Girotto, Legrenzi & Rizzo, 1991) and to overestimate their actual possibility to control outcomes (Langer, 1975).

Appendix B: Scenario (translated from the original Italian text) and composition of the cRDS (Table 10)

You and a friend have to go to an important job interview by train. Yesterday your friend, who is an early riser, offered to pick you up at home very early to go to the train station together. As you knew you were invited to

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Table 10: Composition of the cRDS.

	Questionnaire Item	Description
1	I am sorry about what happened to me	Affective reaction
2	I wish I had chosen to go to the train station with my friend	Regret counterfactual
3	I wish my neighbor hadn't parked in front of the garage	Disappointment counterfactual
4	I feel responsible for having missed the train	Internal attribution
5	My neighbor made me miss the train	External attribution
6	I am satisfied about what happened to me	Control item
7	Things would have gone better if... I had chosen to go to the train station with my friend My neighbor hadn't parked in front of the garage	Choice between counterfactuals

a dinner yesterday evening and imagined that you would be coming home a bit late, you considered that you could sleep an extra 15 minutes if you drove yourself to the station; you therefore declined the proposal.

This morning you are so tired that you don't hear the alarm clock and you woke up later than expected. You got into your car to go to the train station, but a neighbor of yours had parked in front of your garage, and you spend some minutes having him remove it. You eventually reach the station, only to discover that your train has just departed.

Later you hear from your friend, who tells you that the interview went well, and thinks he has a good chance of being hired.

Appendix C: Scenarios (translated from the original Italian text)

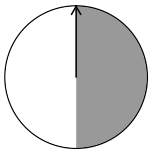
Section common to both conditions

Imagine taking part in a gambling game. Consider the two following wheels of fortune:

Wheel A:

50% chance of winning 500€

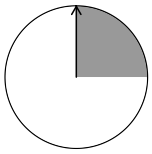
50% chance of winning nothing



Wheel B:

25% chance of winning 1000€

75% chance of winning nothing



Wheel A gives you a 50% chance of winning 500 € and wheel B gives you a 25% chance of winning 1000 €.

Regret scenario

You have to choose the wheel you wish to play and then to push the start button: The arrows inside the wheels will begin to spin, and if the arrow inside your chosen wheel stops on the gray sector, you will win the money prize!

You consider your choice, and then decide to play wheel A. You push the start button. The arrows on both wheels begin to spin quickly. After approximately ten seconds they stop: Unfortunately the arrow of your wheel has stopped on the white sector and you have not won anything! The arrow of wheel B, instead, has stopped on the grey zone: If you had selected this wheel you would have won 1000€!

Disappointment scenario

You have to choose the wheel you wish to play and then to push the start button: The arrow inside the chosen wheel will begin to spin, if it stops on the gray sector, you will win the money prize!

You consider your choice, and then decide to play wheel A. You push the start button. The arrow on the wheel begins to spin quickly. After approximately ten seconds it stops: Unfortunately it has stopped on the white sector and you have not won anything!

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