Regulatory Mode Effects On Counterfactual Thinking and Regret

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Abstract

The present studies examined the influence of two regulatory mode concerns—a locomotion concern with movement from state to state and an assessment concern with making comparisons (see Higgins, Kruglanski, & Pierro, 2003)—on engaging in counterfactual thinking and experiencing post-decisional regret. When contemplating a decision with a negative outcome, it was predicted that high (vs. low) locomotion would induce less counterfactual thinking and less regret, whereas the opposite would be true for high (vs. low) assessment. Locomotion and assessment orientations were measured as chronic individual differences in Study 1 and 2, and were induced experimentally in Study 3. In Study 1 and Study 3 a purchase scenario with a negative outcome was used to elicit counterfactuals and regret, while in Study 2 participants were asked to recall one of their own personal purchases that had a negative outcome. The results supported our predictions. We discuss the implications of these findings for the nature of counterfactual thinking and regret from the perspective of their relation to regulatory mode.

There is increasing recognition of the importance of counterfactual thinking and the experience of regret in economic decisions (e.g. Inman & Zeelenberg, 2002; Landman & Petty, 2000; Tsiros & Mittal, 2000; Zeelenberg & Pieters, 2004). The process of thinking about "what might have been" is known as counterfactual thinking. Because of its relation to counterfactual thinking, regret has been categorized as a "counterfactual emotion", along with disappointment and relief (Kahneman & Tversky, 1982; Roese & Olson, 1995; see also Zeelenberg, 1999). There are some indications in the literature that there may be individual differences in counterfactual thinking and the experience of regret. Landman, for example, hypothesizes that an individual's worldview "could shape the nature and intensity of counterfactuals and emotion" (1995, p.254; see also Landman, 1993).

Generally speaking, it is individual differences in the <u>type of counterfactual thinking</u> that have received the most attention, such as whether individuals use upward or downward comparisons (e.g., Sanna, 1996, 2000), or engage in additive or substractive counterfactual thinking (e.g., Roese, Hur, & Pennington, 1999). In contrast, there is little evidence that individuals differ in their general propensity to engage in counterfactual thinking; i.e., individuals differences in the <u>amount of counterfactual thinking</u>. With respect to regret, most attention has been paid to the conditions under which people show more regret, such as whether the negative outcome of a decision results from an action or an inaction (e.g., Kahneman & Tversky, 1982; Landman, 1987; Zeelenberg, van den Bos, van Djik, & Pieters, 2002), whether it implies switching from or staying with the status quo (e.g., Inman & Zeelenberg, 2002; Tsiros & Mittal, 2000), and whether there is decision justifiability (e.g.

Connolly & Zeelenberg, 2002; Gilovich & Medvec, 1995; Zeelenberg, Van Dijk &

Manstead, 2000). Less attention has been paid to the potential role in regret of a decision

maker's self-regulatory orientation (cf. Camacho, Higgins, & Luger, 2003). The major

purpose of our research was to examine the role of people's <u>regulatory mode</u> orientation—

their chronic or situationally-induced <u>locomotion</u> or <u>assessment</u> concerns—in their general

propensity to engage in counterfactual thinking and experience regret.

<u>Assessment Concerns and Locomotion Concerns</u>

Most deliberate human behaviors comprise activities in two essential regulatory

modes: a mode of assessment and a mode of locomotion. Assessment "constitutes the

comparative aspect of self-regulation concerned with critically evaluating entities or states,

such as goals or means in relation to alternatives in order to judge relative quality"

(Kruglanski, Thompson, Higgins, Atash, Pierro, Shah, & Spiegel, 2000, p. 794). "What are

my options?" "Are there any other possibilities worth considering?" "Which alternative is

best?" "What should I do in the future?" "How did I do in the past?" Individuals strong in

assessment mode are preoccupied with these kinds of critical evaluations (see Higgins,

Kruglanski, & Pierro, 2003). By contrast, the locomotion mode "is the self-regulatory aspect

concerned with movement from state to state and with committing the psychological

resources that will initiate and maintain goal-directed progress in a straightforward manner,

without undue distractions or delays" (Kruglanski et al., 2000, p. 794). In the locomotion

mode, individuals emphasize "doing", "getting on with it", "making something happen" (see

Higgins et al., 2003) rather than critical evaluation. Indeed, individuals strong in locomotion

mode might refrain from critical evaluation if such "stopping to reflect" halted steady movement from state to state.

Whereas classic control theory (cf. Carver & Scheier, 1990; Gollwitzer, 1990; Higgins, 1989; Kuhl, 1985; Mischel, 1974, 1981) conceives of assessment and locomotion as inseparable and interdependent components of any action, Higgins, Kruglanski and their colleagues (Higgins et al., 2003; Kruglanski et al., 2000) have proposed that these functions are independent and that each can be differentially emphasized by individuals, either chronically as a personality disposition or momentarily as situationally induced. To measure chronic individual differences in assessment and locomotion, Kruglanski et al. (2000) developed two separate scales. In a comprehensive series of studies, these authors demonstrated the unidimensionality, internal consistency, and temporal stability of each scale. They found that locomotion and assessment tendencies are essentially uncorrelated with each other, that each contribute to self-regulatory success, and that each relates to a distinct task orientation and motivational emphasis. In generating means to goal attainment, assessment relates to generating a greater number of means to be compared, whereas locomotion relates to generating means quickly. In decision making, locomotion relates to a willingness to choose any activity to work on rather than waiting to begin, whereas assessment relates to a willingness to wait in order to investigate and compare the alternative choices. Individuals with a strong assessment orientation want to critically evaluate different options and relate past and future actions to critical standards. Individuals with a strong locomotion orientation want to quickly initiate action and then maintain it without disruption (see Higgins et al., 2003; Kruglanski et al., 2000).

Situations can also induce momentary individual differences in assessment and locomotion orientation states. Avnet and Higgins (2003), for example, had participants give examples from their personal lives of when they behaved in a manner exemplifying either three high locomotion items (taken from the Kruglanski et al. questionnaire, 2000), thereby inducing a locomotion orientation, or three high assessment items, thereby inducing an assessment orientation. Participants were then given a decision-making task in which they chose among different brands of reading lights. They were assigned either a "full evaluation" strategy where they compared all of the alternatives on all of the attribute values, or a "progressive elimination" strategy where they progressively eliminated whichever brand was worst on the first attribute, and then the second attribute, and so on. Avnet and Higgins (2003) reasoned that the "progressive elimination" strategy would provide participants a stronger sense of "movement" than the "full evaluation" strategy and fit participants in the locomotion condition, whereas the latter would provide more opportunity to make comparisons and fit those in the assessment condition. As predicted, fit effects on increasing the value of the chosen light were found.

Regulatory Mode and Amount of Counterfactual Thinking and Regret

Individuals are assumed to engage spontaneously in counterfactual thinking after negative events or outcomes (Gleicher, Kost, Baker, Strathman, Richman, & Sherman, 1990; Landman, 1987). The experience of regret is considered to be one of the possible emotional consequences of counterfactual thinking. A relation between counterfactual thinking and regret is postulated in various models (e.g. Kahneman & Miller, 1986; Roese, 1997) and there is some evidence to support it (Zeelenberg, van Djik, Van der Pligt, Manstead,

Empelen, & Reinderman, 1998; Tsiros & Mittal, 2000). There is also research distinguishing regret from other negative emotions, such as dissatisfaction or disappointment (e.g. van Dijk & Zeelenberg, 2002; Zeelenberg, van Dijk, Manstead, & van der Pligt, 2000). We return to this distinction in the General Discussion. Here we simply begin with the assumption that a greater amount of counterfactual thinking is associated with a greater amount of regret. We propose that chronic and situationally-induced individual differences in assessment versus locomotion concerns relate to individuals' propensity to engage in counterfactual thinking, which in turn relates to the likelihood of experiencing regret.

The central issue, then, is how might regulatory mode affect the amount of counterfactual thinking? Our first hypothesis is that individuals with a stronger assessment orientation will have a stronger propensity to engage in counterfactual thinking because of their concern with critical evaluation and their tendency to make comparisons. Kruglanski et al. (2000) describe assessors' main aim as "to do the right thing". Since a negative outcome implies having <u>failed</u> "to do the right thing", individuals with a strong assessment orientation should be more prone to engage in the generation of counterfactuals and, in consequence, experience more regret about their choice. Our second hypothesis is that individuals with a stronger locomotion orientation will have a weaker propensity to engage in counterfactual thinking because of their concern with moving smoothly from state to state, without hesitation or interruption. Individuals with a strong locomotion orientation are less likely to pay attention to a decision outcome. They want to "move on" to the next goal pursuit, to just "get on with it" and not dwell on the past.

To test these hypotheses, we conducted a series of three studies. Studies 1 and 2 measured chronic individual differences in regulatory mode. Study 3 experimentally manipulated regulatory mode. Studies 1 and 3 used a purchase scenario with a negative outcome and participants were asked with an open question to write down freely the thoughts that had come to their mind. In Study 2, participants were asked to recall a previous personal purchase with a negative outcome and to indicate the amount of counterfactual thoughts that had come to their mind. Regret was also measured in each study. Because Study 2 is a conceptual replication of Study 1, involving an actual purchase made by the participants rather than an imagined purchase scenario, the basic Method and Results for each study will first be presented separately, followed by a discussion of the results for both studies.

<div align="center">Study 1</div>

Method

  Participants. 83 students of the University of Rome (37 women and 46 men) participated in the study on a voluntary basis. The students attended different psychology majors. Their mean age was 23.89 years (S.D. = 3.74).

  Procedure and materials

  Participants filled out the locomotion and assessment scales. Then they read a scenario about a computer purchase with a negative outcome. To assess counterfactuals after reading the scenario, participants were asked with an open question to write down the thoughts that had come to their mind. Finally, participants filled out a rating scale measuring regret.

Assessing locomotion and assessment. The Italian version of the Locomotion and Assessment Scales (Kruglanski et al., 2000) constitutes two separate 12-item self-report measures designed to tap individual differences in these tendencies. Specifically, respondents rate the extent to which they agree with self-descriptive statements reflecting <u>locomotion</u> (e.g., "By the time I accomplish a task, I already have the next one in mind") or <u>assessment</u> (e.g., I spend a great deal of time taking inventory of my positive and negative characteristics"). Ratings are made on a 6-point Likert type scale with the response alternatives anchored at the ends with 1 (<u>strongly disagree)</u> to 6 (<u>strongly agree)</u>. We computed two composite scores (one for Locomotion and one for Assessment) by summing across responses to each item. Previous studies including Italian samples (Kruglanski et al., 2000) have demonstrated that the Locomotion and Assessment scales have satisfactory reliability (Cronbach α=.82 for the Locomotion Scale and .78 for the Assessment scale). In this sample, the α for the locomotion scale was .72 and the α for the assessment scale also was .72. Mean locomotion score was 4.41 (S.D. = .63) and mean assessment score was 3.58 (S.D. = .75). In this sample, the two scales were only weakly correlated ($\underline{r}$ = .21, $\underline{p}$ < .05), consistent with previous studies that have generally found a pattern of weak correlations between these scales (Kruglanski et al., 2000).

Scenario. The scenario presented after the locomotion/assessment scales was adopted from those used by Tsiros and Mittal (2000, Study 1) and described the following negative outcome purchase experience:

> Paolo is shopping for a laptop computer he needs for work. For some weeks he has informed himself about the different options that are available on the market and has selected two different brands: Siemens and Compaq. The price and the specifications of the computers are very similar; for example

both of them offer technical assistance 24-hours a day, seven days a week. After thinking about the two options, Paolo has decided to go with Siemens. Giorgio, a friend of his, who was also looking for a laptop computer, has decided to go with Compaq.

About three months later Paolo has had some problems with his laptop computer. In fact, whenever he called the technical assistance, he had to wait several minutes before he could talk to a technician. On several occasions his computer locked up, and he had to shut it down, losing all of his unsaved work. In addition, on several occasions he could not open any applications, and he had to shut down the system and try again. Finally, after having waited for two weeks, a technician was able to solve these problems.

His friend Giorgio, on the contrary, has had a great experience with his laptop. He never had a problem with his laptop, and on the only occasion he had a problem, he called the technical assistance, and the technician was very helpful and answered his questions immediately.

Counterfactual thinking. After having read the scenario, participants were asked to imagine that they were Paolo, and to write down all the thoughts that came to their mind in this situation—following the so-called "free-thought instruction" used in previous studies to examine how many counterfactuals participants spontaneously generate (Tsiros & Mittal, 2000). The responses to this open-ended question were content analyzed, using the same coding scheme as Tsiros and Mittal (2000). Each response was coded into one of two categories: a "what-if"/counterfactual thought or not a counterfactual thought. The first category included responses that: "alter reality, create hypothetical scenarios, or express an opinion as to what might have been had a different decision been made" (Tsiros and Mittal, 2000, p. 411). The following are examples of Study 1 participants' counterfactual thoughts: "I should have asked for advice instead of deciding by myself", "I should have chosen the other brand", and "I should have made the same choice as Giorgio."

Assessing regret. To measure the amount of experienced regret in this situation, a rating scale adopted from Tsiros & Mittal (2000, Study 1) was used. The regret scale consists of the three following items, rated on a 7-point scale (items 1 and 2: 1 = *not at all*, 7 = *very much*; item 3: 1 = *not at all*, 7 = *definitely*): "If you were Paolo, how much would you regret choosing a Siemens rather than Compaq notebook?", "How much would you feel sorry for choosing the Siemens notebook?", and "If you could turn back time, would you decide differently?". The α for the regret scale was .85. Mean regret score was 5.16 (S.D. = 1.69).

Results

Control for different versions of scenario. We used two versions of the scenario, alternating which of the two computer brands was chosen by Paolo and by Giorgio. Two one-way ANOVAs revealed that which of the two computer brands was chosen (i.e., the different versions of the scenario) did not have any effect on either the number of counterfactuals produced ($\underline{F} < 1$, n.s.) nor the ratings of regret ($\underline{F} < 1$, n.s.).

Amount of counterfactual thinking and regret as a function of regulatory mode. Two separate simultaneous multiple regressions were performed: one for counterfactuals regressed on participants' locomotion and assessment scores and another for regret regressed on participants' locomotion and assessment scores. [Note. The zero-order correlation between counterfactual thinking and regret was $\underline{r} = .33$, $\underline{p} < .003$.] In these analyses, we also entered gender and the interaction of locomotion and assessment as control variables. [No gender effect was found (regret, $\beta = .12$, ns.; counterfactuals, $\beta = .03$, ns.)].

As predicted, assessment was significantly positively related to counterfactual thinking ($\beta = .377$, $\underline{p} < .001$; zero order correlation, $\underline{r} = .28$, $\underline{p} < .01$), whereas locomotion

was significantly negatively related to counterfactual thinking (β = -.299, p < .01; zero order correlation, r = -.21, p < .05). [Notably, these effects remained significant when the analyses were repeated controlling for the number of non-counterfactuals produced.] The mean number of counterfactuals produced by participants overall was .74; the range was from 0-2 and the median was 1. Among predominant assessors (their assessment score higher than their locomotion score), 40% had 2 counterfactual thoughts and another 50% had 1, with only 10% having no counterfactual thoughts. In contrast, among predominant locomotors (their locomotion score higher than their assessment score), only 17% had 2 counterfactual thoughts, 31% had 1, and over half, 52%, had no counterfactual thoughts.

Also as predicted, assessment was significantly positively related to regret (β = .284, p < .01; zero order correlation, r = .22, p <.05), whereas locomotion was significantly negatively related to regret (β = -.323, p < .01; zero order correlation, r = -.21, p < .05). Importantly, there was no interaction effect between locomotion and assessment (regret, β = .09, ns.; counterfactuals, β = -.14, ns.), reflecting the fact that individual differences in locomotion and individual differences in assessment each had their own independent effects on counterfactual thinking and regret.

Study 2

Method

Participants. 81 students of the University of Rome (67 women and 14 men) participated in the study on a voluntary basis. The students were all psychology majors. Their mean age was 24.91 years (S.D. = 4.81).

Procedure and materials. Participants filled out the same locomotion and assessment scales used in Study 1. In this sample, the α for the locomotion scale was .73 and the α for the assessment scale was .68. Mean locomotion score was 4.21 (S.D. = .64) and mean assessment score was 3.57 (S.D. = .66). In this sample, the two scales were not correlated (r = -.17, n.s.). Then participants then read the following open question asking them to think of a purchase they had made that had a negative outcome: "We now ask you to think about the last time you bought a product or a service after choosing from different available alternatives, with this experience turning out to be negative (the product/service was not good etc.). Please describe the event briefly in the lines below." The great majority of participants mentioned a relatively expensive product or service, such as a cell phone, car, DVD player, microwave oven, vacation or registration to a private school.

Next, participants filled out a regret item similar to the first item of Study 1 ("How much did you regret your purchase?"; mean regret score was 3.91, S.D. = 1.77) and the following item measuring counterfactual thinking: "When rethinking about negative experiences like the one you described, people often develop thoughts such as 'If only … it would have gone better' (e.g. 'If only I had gone to bed early the night before the exam, instead of going to the cinema, I would have gotten a better grade'; 'If only I had informed myself better, I would not have bought that product/service', etc.). Please indicate how many thoughts like that came to your mind when you originally had the experience you described above." (1 = no thought like that, 7 = many thoughts like that; mean counterfactual score was 3.73, S.D. = 1.85).

Results

   Amount of counterfactual thinking and regret as a function of regulatory mode. As in Study 1, we performed separate simultaneous multiple regressions for the regret measure and for the counterfactual thinking measure. [Note. The zero-order correlation between counterfactual thinking and regret was $\underline{r}$ = .55, p <.001] In these analyses, we also entered gender and the interaction of locomotion and assessment as control variables. [No gender effect was found (regret, β = -.02, ns.; counterfactuals, β = -.02, ns.)]. As predicted, assessment was significantly positively related to counterfactual thinking (β = .301, $\underline{p}$ < .005; zero order correlation, $\underline{r}$ = .34, p <.004), whereas locomotion was significantly negatively related to counterfactual thinking (β = -.231, $\underline{p}$ < .05; zero order correlation, $\underline{r}$ = -.27, $\underline{p}$ < .01). Also as predicted, assessment was significantly positively related to regret (β = **.**203, $\underline{p}$ < .05; zero order correlation, $\underline{r}$ = .29, $\underline{p}$ <.009), whereas locomotion was significantly negatively related to regret (β = -.348, p < .002; zero order correlation, $\underline{r}$ = -.43, $\underline{p}$ <.001). Importantly, there was no interaction effect between locomotion and assessment (regret, β = .12, ns.; counterfactuals, β = -.04, ns.), once again reflecting the fact that individual differences in locomotion and individual differences in assessment each had their own independent effects on counterfactual thinking and regret.

Discussion of Studies 1 & 2

   The results of Studies 1 and 2 indicate that the regulatory modes of locomotion and assessment, as predicted, relate significantly to a propensity for counterfactual thinking and experiencing regret. Both studies found that individuals higher in assessment generated more counterfactuals after a negative outcome and experienced more regret, whereas people higher

in locomotion generated less counterfactuals and experienced less regret. These two effects were independent of one another and there was no interaction effect between locomotion and assessment. These results answer the call of Kasimatis and Wells (1995) for identifying chronic individual differences that predict the amount of counterfactual thinking rather than the type of counterfactual thinking.

In the General Discussion, after reporting the results of Study 3, we will discuss the implications of our findings for regulatory mode, counterfactual thinking, and the experience of regret. Here, we wish to raise the issue of what is the relation between counterfactual thinking and regret. Because the regulatory mode questionnaire, counterfactual measure, and regret measure were taken in the same session in Studies 1 and 2, there is the issue of potential measure contamination. Although the assessment scale includes some general items related to critical evaluation, there are no items concerning counterfactual thinking or experiencing regret in the regulatory mode questionnaire. Most important, the same predicted relations between counterfactual thinking and assessment versus locomotion, and between regret and assessment versus locomotion, were found in both Studies 1 and 2 despite the fact that the participants in Study 1 received the counterfactual measure before the regret measure, whereas the participants in Study 2 received the regret measure before the counterfactual measure. That is, the predicted effects of assessment and locomotion were obtained for counterfactual thinking when it appeared first in Study 1, and the predicted effects of assessment and locomotion were obtained for regret when it appeared first in Study 2.

Beyond the measurement issue, there is the psychological issue of how best to characterize the relations among regulatory mode, counterfactual thinking and regret. It

makes sense to begin the path with the locomotion and assessment orientations (as the

predictors) given that, in both studies, locomotion and assessment were measured first in

general terms and the counterfactual thinking and regret experience concerned a particular

event (with the event being new in Study 1). [This is also reasonable given that regulatory

mode is manipulated in Study 3 and the basic results were replicated.] The issue, then, is

whether counterfactual thinking or regret is the mediator. As discussed earlier, the literature

suggests that it is counterfactual thinking that induces regret rather than the reverse. Thus,

one model is that higher assessment increases counterfactual thinking, higher locomotion

decreases counterfactual thinking, and then amount of counterfactual thinking determines

amount of regret (Model 1). An alternative model would reverse this direction, with regret

being the mediator and determining counterfactual thinking (Model 2). Notably, when

counterfactual thinking was controlled as the mediator, Study 1 found that the (significant)

influence of assessment on regret was reduced to non-significance ($\beta = .10$, $p < .11$), but the

(significant) effect of locomotion remained significant [although reduced] (to $\beta = -.251$, $p <$

$.04$, from $\beta = -.323$), and Study 2 also found that the (significant) influence of assessment on

regret was reduced to non-significance ($\beta = .068$, $p > .48$), but the (significant) effect of

locomotion remained significant [although reduced] (to $\beta = -.244$, $p < .02$, from $\beta = -.348$).

Given these findings, a third model must be considered that adds to Model 1 a direct path

from locomotion to regret (Model 3).

     To test which model fit the data better in each study separately, we compared, via

LISREL, the above three alternative path analysis models. In Study 1, we found that Model 1

fit the data ($\chi^2 (2) = 5.18$, $p = 0.07$; CFI = .87) better than Model 2 ($\chi^2 (2) = 8.73$, $p = 0.01$;

CFI = .73), and that Model 3 fit the data better (χ^2 (1) = 3.25, p = 0.07; CFI = .91) than Model

1 or Model 2. In Study 2, we found that Model 2 fit the data (χ^2 (2) = 4.32, p = 0.12; CFI =

.96) better than Model 1 (χ^2 (2) = 11.47, p = 0.03; CFI = .84), and Model 3 fit the data better

(χ^2 (1) = .88, p = 0.35; CFI = 1.00) than Model 1 or Model 2. [Notably, in both studies Model

3 fits the data better than an alternative Model 4 where regret is the mediator and, in addition

to Model 2, there is included a direct path from higher locomotion to decreased

counterfactual thinking: Study 1, χ^2 (1)=6.80, p = 0.01; CFI =.76; Study 2, χ^2 (1)=4.16, p =

0.04; CFI =.98.]

What these results suggest is that both Model 1 and Model 2 receive some support,

but the best model overall is Model 3, where not only is counterfactual thinking the mediator

between assessment increasing and locomotion decreasing regret, but there is also a direct

path from higher locomotion to decreased regret. A third study was conducted to obtain

further support for our basic results. Whereas Study 1 and 2 investigated the influence of

regulatory mode orientation on counterfactual thinking and regret by measuring chronic

individual differences in locomotion and assessment, the regulatory modes of locomotion and

assessment were situationally induced in Study 3.

<div align="center">Study 3</div>

Method

Participants. 94 students of the University of Rome (62 women and 32 men) participated in the study on a voluntary basis. The students attended different psychology majors. Their mean age was 25.14 years (S.D. = 2.19). There were not significant effects of gender.

Procedure and material. Participants were randomly assigned to the locomotion (N = 47) and assessment (N = 47) conditions. Locomotion and assessment were manipulated by asking participants to think of three different situations in which they personally exemplified either high locomotion or high assessment behaviors and to write them down. For locomotion, they were asked to: "Think of a day when you made many different things."; "Think of a time when you finished one project and did not wait long before you started a new one."; "Think of a time when you decided to do something and you could not wait to get started." For assessment, they were asked to: "Think of some occasion in which you compared yourself with other people."; Think of some occasion in which you thought about your positive and negative characteristics."; "Think of some occasion in which you critiqued work done by others or yourself."). The situations were taken from items in the locomotion and assessment scales of the regulatory mode questionnaire used in Studies 1 and 2. This experimental manipulation of locomotion and assessment states has been shown to be effective by Avnet and Higgins (2003).

Participants were told that we were conducting two different studies—a study on "personal memories" and a "consumer" study. After completing the "personal memories" questionnaire, which experimentally induced locomotion and assessment, they filled in the

"consumer study" questionnaire containing the same purchase scenario and regret scale (α = .74) used in Study 1. Counterfactuals were measured by a rating scale as in Study 2. Specifically, we asked participants: "When rethinking about experiences like that of Paolo, people often develop thoughts such as 'If only … it would have gone better' (e.g. 'If only I had gone to bed early the night before the exam, instead of going to the cinema, I would have gotten a better grade'; 'If only I had informed myself better, I would not have bought that product/service', etc.). Please indicate how many thoughts like that would have came to your mind if you were Paolo." (1 = no thought like that, 7 = many thoughts like that). [Note. The zero-order correlation between counterfactual thinking and regret was $\underline{r}$ = .59, p <.001].

Results

As predicted, two one-way ANOVAs were found: a significant main effect for counterfactual thinking, $\underline{F}$(1,92) = 10.07, $\underline{p}$ < .005, and a significant main effect for regret $\underline{F}$(1,92) = 4.91, $\underline{p}$ < .05, with participants in the assessment condition producing significantly more counterfactuals ($\underline{M}$ = 5.74) and more regret ($\underline{M}$ = 5.97) than participants in the locomotion condition (counterfactuals $\underline{M}$ = 4.78; regret $\underline{M}$ = 5.50) (cfr. Fig 1).

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Insert Figure 1 here

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To examine whether the different amount of regret in the two regulatory mode orientations was mediated by counterfactual thinking, we performed an analysis of covariance (ANCOVA) with counterfactuals as a covariate. This analysis showed that the main effect of regulatory mode on regret was not significant when counterfactuals were

controlled for, $\underline{F}(1,91) < 1$, with the effect of the covariate being highly significant, $F(1,91) =$ 48.05, $\underline{p} <. 001$. These results suggest that the influence of locomotion and assessment on regret was mediated by counterfactual thinking. The results of Study 3 demonstrate that the hypothesized relations between regulatory modes—locomotion and assessment—and both counterfactuals and regret hold true not only for chronic regulatory mode predispositions but also for situationally-induced regulatory modes.

General Discussion and Conclusions

The results of our studies suggest that assessment and locomotion concerns, both as chronic individual predispositions and as situationally-induced states, influence the amount of people's counterfactual thinking and their experienced regret. These findings contribute to our understanding of regulatory mode, counterfactual thinking, and regret. Let us begin with regulatory mode. In previous studies of regulatory mode, relatively little attention has been paid to the postactional evaluative phase of self-regulation (see Gollwitzer, 1990). The present findings indicate that assessment concerns and locomotion concerns are clearly distinct in this phase, with individuals higher in assessment delving more into possible alternatives to past actions (i.e., comparing what was done to what might have been done) and individuals higher in locomotion engaging less in such reflective thought (i.e., moving on and not dwelling on the past). In addition, the direct effect of higher locomotion decreasing regret is worth noting. What this suggests is that, separate from decreasing the amount of counterfactual thinking per se, individuals with locomotion concerns want to move on, to get on with it. They don't want to get bogged down in concerns about the past. Regret is about

the past and not the future. Thus, individuals with locomotion concerns are less likely to experience regret.

With respect to counterfactual thinking, the present findings suggest that regulatory mode is a factor determining the amount of counterfactual thinking. This has several implications. To begin with, it identifies a personality variable that influences the propensity to engage in counterfactual thinking (see Kasimatis & Wells, 1995). But it does more than this. Study 3, after all, shows the same basic effect when assessment and locomotion are situationally induced. Together, these findings could help to explain why the literature has found both stability and instability in individuals' propensity to engage in counterfactual thinking (Kasimatis & Wells, 1995). The chronic individual differences in assessment and locomotion could provide the stability. The situationally-induced assessment and locomotion could create the instability.

In addition to this, it should be noted that regulatory mode as a factor in the <u>amount</u> of counterfactual thinking is different from what has been emphasized previously in the literature. Previous factors have mostly predicted the <u>type</u> of counterfactual thinking rather than the amount of counterfactual thinking. As one example, promotion-focused individuals prefer additive counterfactuals whereas prevention-focused individuals prefer subtractive counterfactuals (Roese et al., 1999)—a difference in type of counterfactual thinking and not in amount of counterfactual thinking. As another example, individuals in a deliberative versus an implementational mindset have more pessimistic expectations (Armor & Taylor, 2003), which in turn is related to the use of more upward comparisons but not to a general propensity for more counterfactual thinking (see Sanna, 1996, 2000).

It is also notable that the motivations for counterfactual thinking most often discussed in the literature—self-enhancement, self-protection, self-improvement (Sanna, Chang, & Meier, 2001)—are outcome motives. In contrast, the difference in motivation for counterfactual thinking between individuals with assessment concerns versus locomotion concerns relates to a process or <u>strategic</u> difference. Those with assessment concerns are strategically motivated to engage in counterfactual thinking because it permits making comparisons. Those with locomotion concerns are strategically motivated not to engage in counterfactual thinking because it interferes with smooth and uniform movement to the next state. The assessment motive for counterfactual thinking is of particular interest. In some ways, it relates to self-improvement. But it is not about how to improve future outcomes per se. It is about how to make the decision-making process itself better. It involves critical reflection on both what was good and what was bad about the process—the essence of evaluative criticism. This particular "critical reflection" motive needs more direct study in future research on counterfactual thinking.

The present findings also shed some light on the experience of regret. As mentioned earlier, the experience of regret has been distinguished from the experience of disappointment (e.g. van Dijk & Zeelenberg, 2002; Zeelenberg, van Dijk, Manstead, & van der Pligt, 2000). Van Dijk & Zeelenburgh (2002) report that the experience of regret is different from that of disappointment in that disappointment is about an undesirable outcome, an outcome below expectations, whereas regret involves thinking about one's personal responsibility for what happened, the possibility that one made a mistake, and feeling a tendency to kick oneself and want to correct the mistaken decision. Critical reflection on the process of one's faulty

decision making would produce such thinking, and such postactional critical reflection is more likely to be engaged in by individuals with assessment concerns and less likely by individuals with locomotion concerns. Regret, then, is not simply about negative outcomes per se but about one's role in the decision process itself, and critical self-reflection concerns the decision process itself—what was good and what was bad about the manner in which the decision was made.

The results of Study 3 also specifically increase our understanding of the experience of regret by suggesting that regulatory mode could contribute as a situational variable to how much people engage in counterfactual thinking and experience regret. Some situations or activities might naturally induce a stronger locomotion orientation, such as exercising, whereas others situations might naturally induce a stronger assessment orientation, such as reading a newspaper (Higgins et al, 2003). While people are involved in these different situated activities, if they contemplate a decision they made that turned out poorly, their counterfactual thinking and experience of regret might be greater in the assessment situation than in the locomotion situation. More generally, the influence of locomotion and assessment on counterfactual thinking and regret should be tested for different decision situations that may call for either locomotion or assessment. An example could be different kinds of economic decisions involving more or less time pressure and/or more or less comparisons that need to be made.

Regulatory mode could also moderate some regret effects that have been described in the literature. For example, because individuals with a high locomotion orientation are concerned with moving from one state to another, taking action can be seen as a necessary

aspect of their mode orientation. For this reason, the classic action effect of feeling more regret for taking actions than refraining from action should be weaker for individuals with a high (vs. a low) locomotion orientation (whether chronic or momentary). Similarly, the status quo effect of feeling more regret when switching to something new than when sticking to the status quo (e.g., Tsiros & Mittal, 2000, Study 3) should be weaker for individuals with a high (vs. a low) locomotion orientation because switching from the status quo involves moving from an old state to a new state and such movement suits locomotion concerns.

The present studies examined the relation between regulatory mode orientations and experienced post-decisional regret. There is some empirical evidence that regret is experienced not only after a bad decision outcome, but also when *anticipating* making a decision that could turn out poorly (e.g. Miller & Taylor 1995; Zeelenberg, 1999). In such anticipatory situations, individuals may engage in prefactual thoughts (e.g. McConnell et al., 2000). Regulatory mode should also influence the amount of prefactual thinking and anticipated regret. Analogous to the results of our present studies, individuals with a high (vs. low) assessment orientation (chronic or momentary) should produce more prefactual thinking and anticipate greater regret, whereas individuals with a high (vs. low) locomotion orientation should produce less prefactual thinking and anticipate lesser regret. In particular, compared to individuals with a high locomotion orientation, those with a high assessment orientation should be more sensitive to the effects that anticipated regret can have, including making riskier choices (e.g. Zeelenberg, Beattie, van der Plight, & de Vries, 1996; Zeelenberg & Beattie, 1997), inaction inertia (e.g. Tykocinski & Pittman, 1995), and postponing their

decision. Future research should examine these possible moderating effects of regulatory mode.

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FIG. 1. Mean Regret and Counterfactual Thinking (CFT) Ratings for Locomotion and

Assessment (*Study 3*).